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## Host Plants

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### Headings Under Which Diseases Are Described

**ANTHRACNOSE** – dead spots with definite margins, often with pinkish slimy spore masses, on leaves, stems, or fruit.

**BACTERIAL DISEASES** – all types of diseases, galls, blights, rots, leaf spots, caused by bacteria.

**BLACK KNOT** – black, knotty enlargement of woody tissue.

**BLACKLEG** – darkening at the base of a plant.

**BLACK MILDEW** – superficial dark growth caused by parasitic fungi.

**BLACKSPOT** – a dark leaf spot on rose.

**BLIGHTS** – general killing of leaves, flowers, stems.

**BLOTCH DISEASES** – irregular necrotic areas on leaves or fruit.

**BROOMRAPES** – leafless herbs parasitic on roots.

**CANKERS AND DIEBACK** – localized lesions on stems or trunks, sometimes accompanied by dying back from the top.

**CLUB ROOT** – distorted swollen roots.

**DAMPING-OFF** – sudden wilting of seedlings or rotting of seeds in soil.

**DODDER** – parasitic seed plant with orange tendrils.

**DOWNY MILDEWS** – with internal mycelium but fruiting structures protruding to form white, gray, or violet patches.

**FAIRY RINGS** – mushrooms growing in circles.

**FRUIT SPOTS** – blemishes on fruit.

**GALLS** – noticeable enlargements of leaves, stems, or roots.

**LEAF BLISTER, LEAF CURL DISEASES** – leaf deformities.

**LEAF SCORCH** – discoloration as if by intense heat.

**LEAF SPOTS** – delimited dead areas in leaves.

**LICHENS** – occasional on trees, or shrubs.

**MISTLETOE** – semiparasitic seed plant, forming leafy tufts in trees.

**MOLDS** – conspicuous fungus growth on leaves, seeds, or grafts.

**NEEDLE CASTS** – conspicuous shedding of evergreen foliage.

**NEMATODES** – causing decline diseases and flowers.

**NONPARASITIC DISEASES** – due to environmental conditions rather than specific organisms.

**POWDERY MILDEWS** – superficial white felty or powdery growth on leaves and flowers.

**ROTS** – soft or hard decay or disintegration of plant tissues.

**RUSTS** – with reddish or rust-colored spore masses.

**SCAB** – raised or crustlike lesions on leaves or fruit.

**SCURF** – flaky or scaly lesions.

**SLIME MOLDS** – found in lawns.

**SMUTS** – with sooty black spore masses.

**SNOW MOLD** – light patches in turf, especially early spring.

**SOOTY MOLD** – superficial black mycelium growing in insect exudate.

**SPOT ANTHRACNOSE** – light spots with raised darker borders or scabby lesion caused by *Elsinoë* species.

VIRUS DISEASES – mosaics, ring spots, yellows, wilt caused by viruses.

WHITE RUSTS – white blisters in leaves.

WILTS – systemic diseases, with wilting, death of leaves, and branches.

WITCHWEED – weed parasitic on roots.

The numbers given with the rusts refer to spore stages. See under ►RUSTS.

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## Abelia

LEAF SPOT. *Cercospora abeliae*, IL.

NEMATODE, Root Knot. *Meloidogyne arenaria*; **M. hapla**; **M. incognita**.

NONPARASITIC. **Chlorosis**, due to soil alkalinity, TX.

POWDERY MILDEW. *Oidium* sp., TX.

ROT, Root. *Phymatotrichum omnivorum*, TX; **Rhizoctonia solani**, TX; *Pythium* sp.

VIRUS. *Abelia* Latent, MD.

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## Abutilon (Flowering Maple, Indian Mallow, Velvet Leaf)

BLIGHT, Foliage. *Colletotrichum coccodes*, VT.

BLIGHT, Phytophthora. *Phytophthora capsici*, IL.

LEAF SPOT. *Alternaria* sp., IL, IN, NJ, NY, TX; **Cercospora avicennae**, MO, VA; **Cladosporium herbarum**, KS, NY; **Colletotrichum malvarum**, IA; **Phyllosticta althaeina**, TX.

NEMATODE, Root Knot. *Meloidogyne* sp., AL, FL; **M. incognita**, IN; **M. hapla**.

ROT, Root. *Phymatotrichum omnivorum*, TX; *Armillaria mellea*, CA.

ROT, Stem. *Macrophomina phaseoli*, IL.

RUST. *Puccinia heterospora* (III), FL to AZ.

VIRUS. **Abutilon Infectious Variegation**; **Abutilon Yellows**, CA; **Bean Mosaic**, HI; **Mosaic**, universal.

WILT. *Verticillium albo-atrum*, NJ; **V. dahliae**, WI.

The leaf spots and rot occur on Indian mallow and velvet leaf. Variegation in flowering maple is

a true mosaic disease, although fostered as a desirable ornamental quality.

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## Acacia

CANKER, Twig and Branch. *Nectria ditissima*, CA, SC.

LEAF SPOT. *Physalospora fusca*, FL; *Cercospora* sp., GA; **Phyllachora texana**, TX.

LEAF SPOT, Algal. *Cephaleuros virescens*, FL.

MISTLETOE. **Phoradendron californicum**, CA, TX; **P. serotinum (flavescens)**, TX.

NEMATODE, Root Knot. *Meloidogyne* sp.

NONPARASITIC. **Chlorosis**, due to excess lime, CA. **Gummosis**, due to deficient or irregular moisture, CA.

POWDERY MILDEW. *Erysiphe polygoni*, CA.

ROT, Heartwood. *Ganoderma applanatum*, CA.

ROT, Mushroom Root. *Armillaria mellea*, occasional; *Clitocybe tabescens*, FL.

ROT, Root. *Phymatotrichum omnivorum*, TX.

ROT, Sapwood. *Schizophyllum commune*, CA.

RUST. **Ravenelia australis**, TX; **R. gooddingii**, AZ; **R. hieronymi**, witches' broom, TX; **R. igualica**, TX; **R. roemerianae**, TX; **R. siliquae**, NM, TX; **R. subtortuosae**, witches' broom, TX; **R. thornberiana**, witches' broom, AZ, TX; **R. versatilis**, AZ, CA, NM, TX.

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## Acacia (Koa Tree)

LEAF SPOT, BROWN; Dark Blight. *Calonectria colhounii*, HI.

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## Acalypha (Copper-Leaf)

DOWNY MILDEW. *Plasmopara acalyphae*, WI.

GALL, Leaf. *Synchytrium aureum*, WI.

LEAF SPOT. *Cercospora acalyphae*, NY to AL, OK, TX, WI; *Phyllosticta* sp., NJ; *Ramularia acalyphae*, TX.

NEMATODE, Lesion. *Pratylenchus* sp., FL.

NEMATODE, Root Knot. *Meloidogyne* sp., GA, MD; **M. incognita**, IN.

POWDERY MILDEW. *Golovinomyces cichoracearum*, WI.  
 ROT, Mushroom Root. *Clitocybe tabescens*, FL.  
 ROT, Root. *Phymatotrichum omnivorum*, TX;  
*Rhizoctonia solani*, IL.

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### Acanthus

BACTERIAL, Proliferation. *Rhodococcus fascians*, OR.  
 LEAF SPOT. *Cercospora beticola*, CA.

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### Acanthopanax (Five-Leaf Aralia)

LEAF SPOT. *Alternaria* sp., MO.  
 ROT, Root. *Phymatotrichum omnivorum*, TX.

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### Achimenes

VIRUS. Tobacco Mosaic, CA, CT, DC, FL, OH, WA.

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### Acroptilon Repens (Knapweed, Russian)

LEAF SPOT. *Cercospora acroptili*, MT.  
 RUST. *Puccinia acroptili*, CO, MT, WY.

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### Actinomeris (Yellow Ironweed)

LEAF SPOT. *Cercospora anomala*, IA;  
*Gloeosporium* sp., WV.  
 POWDERY MILDEW. *Golovinomyces cichoracearum*, PA to VA, KS.  
 RUST. *Puccinia verbesinae* (0, I, II, III), ME, MD, TN.  
 VIRUS. Tobacco Ring Spot, VA.

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### Adoxa (Musk-Root)

GALL, Leaf. *Synchytrium anomalum*, IA.  
 LEAF SPOT. *Phyllosticta adoxae*, CO.

RUST. *Puccinia adoxae* (III), CO, UT, WY;  
*P. argentata* (0, I), IA, MN, WI. II, III on  
*impatiens*.

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### Aegopodium (Bishop's Weed)

VIRUS. Tomato Spotted Wilt, PA.

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### Aeschynomene (Northern Joint-Vetch)

CANKER, Stem. *Diaporthe phaseolorum* var.  
*caulivora*, LA.

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### Aeschynanthus

VIRUS. Tobacco Mosaic, CA, CT, DC, FL,  
 OH, WA.

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### African Daisy (*Arctotis*) (*Gerbera jamesonii*)

LEAF SPOT, Blotch. *Cercospora* sp., FL.  
 NECROSIS, Leaf, Crown. *Sclerotinia sclerotiorum*, AZ.  
 NEMATODE, Root Knot. *Meloidogyne* sp., FL.  
 ROT, Crown and Stem. *Whetzelinia sclerotiorum*, CA; *Sclerotinia sclerotiorum*, LA.  
 ROT, Root. *Phymatotrichum omnivorum*, TX.  
 ROT, Root, Crown, and Stem. *Phytophthora cryptogea*, CA.  
 VIRUS. Tomato Spotted Wilt. *Impatiens* Serotype, GA.  
 WHITE RUST. *Albugo tragopogonis*, NC.

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### African Violet (*Saintpaulia*)

BACTERIAL Leaf Blight. *Pseudomonas* sp., OR.  
 BLIGHT, Gray Mold. *Botrytis cinerea*,  
 cosmopolitan.

NEMATODE, Leaf. *Aphelenchoides ritzemabosi*;  
Lesion, *Pratylenchus* sp., MD, NJ, OH.

NEMATODE, Root Knot. *Meloidogyne arenaria*,  
general.

NEMATODE, Spiral. *Scutellonema brachyurus*,  
MD.

NONPARASITIC. **Ring Spot**, due to wetting foliage  
with cold water, general.

**Petiole Rot**, from touching rim of salt-encrusted  
pot.

POWDERY MILDEW. *Oidium* sp., occasional in  
greenhouses.

ROT, Root. *Rhizoctonia solani*; *Fusarium*  
*solani*, MD, NY; *Cylindrocarpon radicola*,  
MD, NY.

ROT, Root and Crown. *Pythium ultimum*, CA,  
probably general; *Phytophthora* sp.,  
MD, NC.

Bright yellow ring patterns appear if there is  
too steep a temperature gradient between leaf and  
water. Yellowing may be due to excessive bright  
sunlight. Non-flowering may be due to improper  
light. Root-knot nematodes as well as mites  
causes thickened, blistered leaves.

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### Agapanthus (African-Lily)

BACTERIAL Leaf Streak (water-soaked).  
*Xanthomonas axonopodis*, FL.

VIRUS. *Ornithogalum* Mosaic.

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### Agastache (Giant-Hyssop)

DOWNY MILDEW. *Peronospora lophanthi*, IL, IA,  
WI.

LEAF SPOT. *Ramularia lophanthi*, CA, MT;  
*Septoria lophanthi*, IL, MO, OH, WI.

LEAF SPOT; Stem Spot. *Ascochyta lophanthi*, IL,  
IA, WI.

POWDERY MILDEW. *Sphaerotheca macularis* (*S.*  
*humuli*), MO, UT, WA, WI.

RUST. *Puccinia hyssopi* (III), NY to IA, MO, WI.

VIRUS. **Mosaic**. Unidentified, IN.

WILT. *Verticillium dahliae*, IA.

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### Ageratum

BLIGHT, Southern. *Sclerotium rolfsii*, NJ, NC,  
probably widespread.

POWDERY MILDEW. *Golovinomyces*  
*cichoracearum*, MD.

ROT, Root. *Pythium mamillatum*, CA.

ROT, Root and Stem. *Rhizoctonia solani*, IL, NJ,  
NM.

ROT, Stem. *Alternaria zinniae*, IL.

RUST. *Puccinia conoclinii* (II, III), GA, MS, NC;  
0, I unknown.

VIRUS. **Bidens Mottle**, FL; **Tomato Spotted**  
**Wilt-lettuce serotype**, GA.

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### Agrimony (*Agrimonia*)

BLIGHT, Stem. *Phoma herbarum*, TX.

DOWNY MILDEW. *Peronospora potentillae*, IA,  
NY, WI.

LEAF SPOT. *Cercospora* sp., IL; *Phyllosticta*  
*decidua*, NC, WI; *Septoria agrimoniae*, IL,  
IN, IA, MO, NY, NC, TX, WI; *S. agrimoniae-*  
*eupatoriae*, IA.

POWDERY MILDEW. *Sphaerotheca macularis*,  
MA, NE, NC, WI.

ROT, Root. *Phymatotrichum omnivorum*, TX.

RUST. *Puccinia agrimoniae* (II, III), MO;  
0, I unknown; *Pucciniastrum agrimoniae*  
(II, III), general ME to FL, NM, ND;  
0, I unknown.

VIRUS. **Mosaic**. Unidentified, NY.

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### Ailanthus (Tree-of-Heaven)

BLACK MILDEW. *Dimerosporium robiniae*, DC.

BLIGHT, Twig. *Gibberella baccata*  
(*Fusarium lateritium*), VA; *Diplodia*  
*ailanthi*, TX; *D. natalensis*, TX; *Phoma*  
*ailanthi*, TX.

CANKER; DIEBACK. *Nectria cinnabarina*, KS, NJ,  
SC; *N. coccinea*, occasional; *Physalospora*  
*obtusa*, KS, MI, NY.

LEAF SPOT. *Cercospora glandulosa*, widespread;  
*Gloeosporium ailanthi*, LA, TX, WV;

**Phyllosticta ailanthi**, VA; **Cristulariella pyramidalis**, FL.

ROT, Butt. **Daedalea unicolor**, occasional.

ROT, Root. **Armillaria mellea**, Northeast;

**Phymatotrichum omnivorum**, TX.

ROT, Wound. **Polyporus lacteus**; **P. versicolor**, occasional in living trees; **Schizophyllum commune**.

WILT. **Verticillium albo-atrum**, NY, PA, VA.

Ailanthus is well adapted to city smoke and not often troubled by disease except for wilt, which can be serious and has killed many trees in the Philadelphia area.

### Akee Tree (*Blighia sapida*)

WILT; DIEBACK. **Verticillium dahliae**, FL.

### Alder (*Alnus*)

BACTERIAL Leaf Blight. **Xanthomonas campestris**, CA.

BLIGHT, Gray Mold. **Botrytis cinerea**, WA.

CANKER, BROWN Felt. **Septobasidium filiforme**, NC; **S. peckii**, NY.

CANKER; DIEBACK. **Nectria coccinea**, NY, PA; **N. galligena**, NH; **Hymenochaete agglutinans**, MI, NY, PA; **Melanconis alni**, ME to NJ, WI; **Phomopsis alnea**, KY; **Physalospora obtusa**, SC, VA; **Solenia ochracea**, widespread on bark; **Didymosphaeria oregonensis**, ID, OR, WA; **Valsa melanodiscus**, western North America.

CANKER, Stem. **Cytospora** sp., OR.

DODDER. **Cuscuta compacta**, MD, VA.

GALL, Root. Cause unknown.

LEAF BLISTER, Catkin Hypertrophy. **Taphrina robinsoniana**, widespread; **T. japonica**, AK, CA, OR; **T. occidentalis**, CA, ID, MT, OR, WA.

LEAF SPOT. **Cercospora alni**, WI; **Cercospora alni**, AK, OR, WA; **Dothidella alni**, black spot; **Gloeosporium tubiformis**; **Cylindrosporium vermiforme**, WI;

**Ophiodothis alnea**, tar spot, NH, PA; **Phyllosticta alnea**, AK; **Septogloeum variegatum**, CA; **Septoria alni**, AK, CA, NY, WA, WI, OR; **Hypospila californica**, CA.

MISTLETOE. **Phoradendron serotinum (flavescens)**, AZ, NM; **P. villosum**, CA; **Viscum album**, CA; on *Alnus rubra* (Red Alder).

MISTLETOE, European. **Viscum album**, CA.

NEMATODE, Root Knot. **Meloidogyne** sp.

POWDERY MILDEW. **Erysiphe aggregata**, ME to NJ, CA, MN, WA; **Phyllactinia corylea**, ME to WI, AL, SC; **Microsphaera alni**, widespread.

ROT, Heart. **Daedalea unicolor**; **Fomes igniarius**; **F. pinicola**; **Ganoderma applanatum**; **Polyporus sulphureus**.

ROT, Root. **Armillaria mellea**, CA; **A. nabsnona**, HI; **Phymatotrichum omnivorum**, TX.

ROT, Wood. **Daedalea confragosa**; **Daldinia occidentalis**; **Fomes scutellatus**; **Lenzites saepiaria**; **L. trabea**; **Pholiota adiposa**; **Pleurotus serotinus**; **Polyporus adustus**; **P. hirsutus**; **P. versicolor**; **Schizophyllum commune**; **Steccherinum ochraceum**; **Stereum** spp., mostly on dead wood.

RUST. **Melamsoridium alni** (II, III), CA, TX.

SOOTY MOLD. **Scorias spongiosa**, NY to NC, WV.

### Alfalfa (*Medicago*)

ANTHRACNOSE. **Colletotrichum trifolii**, OH.

LEAF SPOT. **Phoma medicaginis**, WA.

ROT, Brown Root. **Phoma sclerotoides**, CO, ME, NM, PA, Ontario, Canada.

VIRUS. **Rhabdovirus**, Argentina; **Cucurbit Yellow Stunting Disorder**, CA.

### Allamanda

NEMATODE, Burrowing. **Radopholus similis**, FL.

NONPARASITIC. **Chlorosis**, magnesium deficiency in overlimed or acid soil, FL.

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### Alliaria (Garlic Mustard)

ROT, Root. *Fusarium solani*, IL.

VIRUS. Cucumber Mosaic, OH.

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### Allionia (Trailing Four-O'Clock)

DOWNY MILDEW. *Peronospora oxybaphi*, KS, SD.

LEAF SPOT. *Ascochyta oxybaphi*, IA, WI;

*Cercospora oxybaphi*, IA, KS, WI.

ROT, Root. *Phymatotrichum omnivorum*, TX.

RUST. *Puccinia aristidae*, AZ, NM, TX.

WHITE RUST. *Albugo platensis*, AZ, NM, TN, TX.

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### Allspice (*Pimenta*)

RUST. *Puccinia psidii*, FL.

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### Almond (*Prunus amygdalus*)

ANTHRACNOSE. *Colletotrichum acutatum*, CA.

ANTHRACNOSE; Kernel Rot. *Gloeosporium amygdalinum*, CA.

BACTERIAL Crown Gall. *Agrobacterium tumefaciens*, AL, AZ, CA, NC.

BACTERIAL Leaf Spot. *Xanthomonas pruni*, NE.

BACTERIAL Shoot Blight; Blast. *Pseudomonas syringae*, CA.

BLIGHT, Blossom; Brown Rot. *Monilinia laxa*, CA, OR; *Botrytis cinerea*.

BLIGHT, Leaf; Shot-Hole Disease. *Coryneum carpophilum*, CA, ID, OR.

CANKER; DIEBACK; Crown Rot. *Phytophthora cactorum*, CA, *P. citrophthora*, CA; *Botryosphaeria dothidea* (*Dothiorella canker*) CA; *Ceratocystis fimbriata*, CA.

CANKER, Pruning Wound. *Phytophthora syringae*, CA.

DECLINE, Almond. Unknown etiology, CA. "Golden Death".

LEAF SPOT. *Cercospora circumscissa*, CA, OR; *Hendersonia rubi*, CA; *Alternaria*

*alternata*, CA; *A. arborescens*, CA; *A. tenuissima*, CA.

NEMATODE, LESION. *Pratylenchus vulnus*, CA.

NEMATODE, Root Knot. *Meloidogyne* sp., AZ.

NONPARASITIC. **Bud Failure.** Seed transmitted, increased by pruning.

**Chlorosis.** Iron deficiency.

**Little Leaf.** Zinc deficiency.

POWDERY MILDEW. *Podosphaera tridactyla*, CA; *Sphaerotheca pannosa*, CA.

ROT, Fruit. *Phomopsis amygdali*, CA, and associated branch dieback.

ROT, Green Fruit. *Sclerotinia sclerotiorum*, CA.

ROT, Heart. *Polyporus versicolor*, OR.

ROT, Hull. *Rhizopus* spp.

ROT, Root. *Armillaria mellea*, CA, NC; *Phymatotrichum omnivorum*, TX.

ROT, Wound. *Schizophyllum commune*, CA.

RUST. *Tranzschelia discolor* (II, III); 0, I on anemone, CA.

SCAB. *Cladosporium carpophilum*, CA, CT, OR.

VIRUS. **Almond Bud Failure; Almond Calico, CA; Peach Mosaic; Peach Ring Spot; Peach Rosette; Peach Yellow Bud Mosaic; Peach Yellows.**

WILT. *Verticillium albo-atrum*, CA, IL.

Crown rot and *Armillaria* rot are often limiting factors in almond production. At least five sprays are necessary to control brown rot, leaf blights, and scab, and often a zinc sulfate spray for little leaf. The California Agricultural Experiment Station Extension Service provides, each year, a revised "Spray, Dust and Fumigation Program for Almonds".

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### Almond, Flowering (*Prunus triloba*)

BACTERIAL Fire Blight. *Erwinia amylovora*, IN.

BACTERIAL Spot. *Xanthomonas pruni*, NJ.

BLIGHT, Blossom and Twig. *Botrytis cinerea*, NY; *Monilinia fructicola*, CT, KS.

POWDERY MILDEW. *Podosphaera oxyacanthae*, IA.

ROT, Mushroom Root. *Armillaria mellea*, MS; White Root, *Corticium galactinum*, MD.

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## Aloe

ROT, Root. *Pythium ultimum*, CA.

Immerse nursery plants of *Aloe variegata* in hot water at 115 °F for 30 min; place in cold water; dry; replant.

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## Alstroemeria

VIRUS. **Alstroemeria Mosaic**; *Alstroemeria*, NY.

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## Alternanthera

LEAF SPOT, *Phyllosticta amaranthi*, NJ.

NEMATODE, Root Knot. *Meloidogyne* sp.

ROT, Root. *Rhizoctonia solani*, NJ.

ROT, Root; Wilt. *Fusarium oxysporum*, NJ.

VIRUS. Alternanthera Mosaic, FL.

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## Alyssum (Goldentuft, Yellowtuft)

CLUB ROOT. *Plasmodiophora brassicae*, NJ.

DAMPING-OFF. *Rhizoctonia solani*, NJ.

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## Amaranthus (Love-Lies-Bleeding, Princes-Feather, Joseph-Coat, Spiny Amaranth)

BACTERIAL, MLO. Aster Yellows, MD, NY.

CANKER, Stem. *Diaporthe phaseolorum* var. *caulivora*, LA.

DAMPING-OFF. *Pythium debaryanum*, CT.

LEAF SPOT. *Cercospora canescens*, MD.

NEMATODE, Root Knot. *Meloidogyne* sp., FL, MD.

ROT, Root. *Phymatotrichum omnivorum*, TX.

ROT, Stem. *Macrophomina phaseolina*, AZ.

VIRUS. **Beet Curly Top**, CA, TX; **Alfalfa Mosaic**, WA.

WHITE RUST. **Albugo bliti**, MA to FL, NE, SC, TX.

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## Amaryllis (includes *Hippeastrum*)

BLIGHT, Gray Mold; Bulb Rot. *Botrytis cinerea*, occasional, chiefly in outdoor plantings after chilling.

BLIGHT, Southern; Bulb Rot. *Sclerotium rolfsii*, FL, TX.

LEAF SCORCH; Red Blotch. *Stagonospora curtisii*, general.

LEAF SPOT. *Cercospora amaryllidis*, AL, LA; *Colletotrichum crassipes*; *Fusarium bulbigenum*; *Melanospora fallax*; *Epicoccum purpurascens*, secondary.

NEMATODE, LESION. *Pratylenchus scribneri*, FL. *Scutellonema brachyurus*, FL.

ROT, Bulb. *Rhizopus stolonifer*.

ROT, Seedling Root. *Pythium debaryanum*, FL, TX; Root, *Armillaria mellea*, CA.

VIRUS. **Cucumber Mosaic**, FL; unidentified **Mosaic**, CA, FL, OK, WI; **Tomato Spotted Wilt**, CA, TX; **Hippeastrum Mosaic**.

Although amaryllis is subject to red spotting from various physiological causes, mite, and insect injuries, the fungus leaf scorch or red blotch is fairly common, with red spots on leaves, flower stalks, and bulb scales.

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## Amaryllis, Wild (*Nothoscordum bivalve*; *N. inodorum*)

VIRUS. **Nothoscordum Mosaic**, LA.

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## Amelanchier (Serviceberry, Juneberry)

BACTERIAL Fire Blight. *Erwinia amylovora*, widespread.

BLACK MILDEW; Witches Broom. *Apiosporina collinsii*, widespread.

BLIGHT, Leaf. *Fabraea maculata*, widespread.

BLIGHT, Fruit and Leaf. *Monilinia gregaria*, CO, IA, WA.

CANKER. *Nectria cinnabarina*, occasional; *Pezizula pruinosa*, wide-spread; *Gloeosporium perennans*, OR.

CANKER, Blister. *Nummularia discreta*, IA, KS, MA, OH.

LEAF BLISTER; Witches' Broom. *Taphrina amelanchieri*, CA.

LEAF SPOT. *Coccomyces tumidus*, MO, MT; *Cristulariella pyramidalis*, NC; *Phyllosticta innumerabilis*, IA, MN, NE, ND; *P. pauperula*, KS, MT; *P. virginiana*, NY, PA, WI.

POWDERY MILDEW. *Erysiphe polygoni*, ID, MT; *Phyllactinia corylea*, OR, WA; *Podosphaera oxyacanthae*, occasional.

ROT, BROWN; Fruit. *Monilinia amelanchieris*, NY; *M. fructicola*, MI, OH.

ROT, Root. *Phymatotrichum omnivorum*, TX.

ROT, Wood Butt. *Daedalea unicolor*, cosmopolitan.

RUST. *Gymnosporangium biseptatum* (I); III on *Chamaecyparis*, northeastern and Middle Atlantic States. Horned galls, underside leaves. *G. clavariiforme* (I) on leaves, fruits, stems; III on juniper. *G. clavipes* (I) on fruits, stems; III on juniper. *G. corniculans* (I); III on juniper. *G. cupressi* (0, I); III on cypress. *G. gracile* (0, I); III on juniper. *G. harknessianum* (I) on fruits, CA, OR; III on juniper. *G. inconspicuum* (I) on fruits; III on juniper. *G. juvenescens* (I); III on juniper, in West (may be *G. nidusavis*). *G. kernianum* (I) on leaves, AZ, CO, OR; III on juniper. *G. libocedri* (I) on leaves, CA, OR; III on juniper. *G. nelsonii* (I) on leaves, fruits; III on juniper, MI. *G. nidusavis* (I) on leaves, fruits, stems; III on juniper, central and eastern states.

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## Amorpha (Leadplant, Indigobush)

CANKER, Twig. *Cytospora amorphae*.

LEAF SPOT. *Cylindrosporium passaloroides*, widespread; *Diplodia amorphae*, TX.

POWDERY MILDEW. *Erysiphe polygoni*, IA, MN, WY.

RUST. *Uropyxis amorphae*, general.

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## Ampelopsis (*A. cordata* and other species)

CANKER; DIEBACK. *Nectria cinnabarina*, occasional.

DOWNY MILDEW. *Plasmopara viticola*, NY, WI.

LEAF SPOT. *Cercospora truncata*, LA; *C. vitis*, AL, LA; *Guignardia bidwellii*, widespread; *Linospora psederiae*, WV; *Phloeospora ampelopsidis*, WI.

NEMATODE, Dagger. *Xiphinema index*.

POWDERY MILDEW. *Uncinula necator*, widespread. ROT, Root. *Helicobasidium purpureum*, TX.

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## Amsonia

LEAF SPOT. *Mycosphaerella* sp., GA.

RUST. *Coleosporium apocyanaceum* (II, III) on leaves, FL, GA, SC; 0, I on pine. *Puccinia seymouriana* (0, I), MO; II, III on marsh grass.

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## Anaphalis (Pearl Everlasting)

LEAF SPOT. *Septoria margaritaceae*, NY, OR, WI.

RUST. *Uromyces amoenus* (III), CA, ID, MI, MT, OR, WA, WY.

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## Anchusa (Buglos, Alkanet)

DAMPING-OFF. *Rhizoctonia solani*, CT.

LEAF SPOT. *Stemphylium* sp., NY.

RUST. *Puccinia recondita* var. *secalis* (0, I), IN, MI; II, III on rye.

VIRUS. *Mosaic*, unidentified, IN.

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## Andromeda (Bog-Rosemary)

(►*Lyonia* and ►*Pieris* for shrubs commonly called *Andromeda*)

BLACK MILDEW. *Asterina clavuligera*, GA, NJ.

BLIGHT, Ramorum. *Phytophthora ramorum*, PA.



GALL; Red Leaf Spot. *Exobasidium vaccinii*, AK, ME, NY, WI.

LEAF SPOT. *Venturia arctostaphyli*, NY.

LEAF SPOT. Tar. *Rhytisma andromedae*, ME to NC, AK, MI, MN.

POWDERY MILDEW. *Microsphaera alni* var. *vaccinii*, MA, NJ.

RUST. *Chrysomyxa cassandrae* (II, III); 0, I on pine.

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### Anemone (Cultivated forms, Japanese)

BACTERIA, MLO. Aster Yellows, CA.

BLIGHT, Collar Rot. *Botrytis cinerea*, NJ, PA.

BLIGHT, Southern. *Sclerotium rolfsii*, CA, MD, MA.

LEAF SPOT. *Gloeosporium* sp., NY; *Phyllosticta anemones*, MD.

NEMATODE, Leaf. *Aphelenchoides fragariae*; *A. ritzemabosi*, CA.

NEMATODE, Root. *Aphelenchus agricola*, CA.

RUST. *Tranzschelia cohaesa* (0, I, II, III), TX; *T. discolor* (0, I), CA, OR; II, III on *Prunus* spp.

VIRUS. Mosaic. Unidentified, CA; Tobacco Rattle, MN.

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### Anemone (Native Species)

DOWNY MILDEW. *Plasmopara pygmaea*, widespread.

GALL. *Synchytrium anemones*, IA MA, MI, MN, VT, WI.

LEAF SPOT. *Cercospora pulsatillae*, CO; *Cercospora filiformis*, WI; *Didymaria didyma* IA MI WI; *Phloeospora anemones* IA; *Phyllosticta anemonicola*, IL, MI, ME, NE, VA, WI; *Ramularia ranunculi*, NY, WI; *Septoria anemones*, IL, IA, MS, MO, TX, VT, WI; *S. cylindrica*, MT, VA; *S. punicea*, KS, MA, MI, MS, NE.

POWDERY MILDEW. *Erysiphe polygoni*, IL, IA, IN, MI, MN, NJ, ND, WI.

RUST. *Puccinia anemones-virginianae* (III), ME to MS to NE, ND; *P. gigantispora* (0, I, III), CO, IL, ID, MT, ND, WI, WY; *P. magnusiana* (0, I), NY to KS, ND; II, III on reed grasses; *P. pulsatillae* (III), CO, IA, ND, SD; *P. recondita* (0, I), NY to TX; II, III on grasses; *P. resecta*, AK, CO; *P. vesiculosa*, AK; *Tranzschelia cohaesa* (0, I, II, III), TX; *T. pruni-spinosae* (0, I), IA, KS, NE to TX, AL; II, III on *Prunus* spp.; *T. fusca* (0, III), MA to VA, CA, and Northwest; *T. suffusca* (0, III), CO, IA, MT, ND, SD; *T. tucsonensis* (0, I, II, III), AZ.

SMUT, Leaf and Stem. *Urocystis anemones*, ME to AK, DE, CO, KS, IA, MN, ND, WI; *U. sorosporioides*, AK.

SMUT, White. *Entyloma ranunculi*, WI.

VIRUS. Cucumber Mosaic, AR.

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### Angelica

LEAF SPOT. *Cercospora apii* var. *angelicae*, AK; *C. thaspiae*, AL, TX; *Fusicladium angelicae*, general; *Gloeosporium angelicae*, SC; *Phyllosticta angelicae*, CA, WY; *Piggotia depressa*, MT; *Ramularia angelicae*, CO; *Septoria dearnessii*, NC, WI.

ROT, Root. *Phymatotrichum omnivorum*, TX.

RUST. *Puccinia angelicae* (0, I, II, III), NY, OR, PA, WA; *P. bistortae*, AK; *P. coelopleuri* (0, I, II, III), AK; *P. ellisii*, CA, ID, NV, OR, WA; *P. ligustici*, CO, WA; *P. poromera*, UT.

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### Angelonia (*Angelonia angustifolia*)

NEMATODE, Root Gall, *Meloidogyne mayaguensis*, FL.

VIRUS, *Alternanthera* Mosaic, NY.

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### Anise (*Pimpinella anisum*)

LEAF SPOT. *Cercospora malkoffi*, VA.

ROT, Root. *Phymatotrichum omnivorum*, TX.

ROT, Stem. **Sclerotinia sclerotiorum**, CA, TX.  
RUST. **Puccinia pimpinellae** (0, I, II, III), CA.

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### Anise-Tree (*Illicium floridanum*)

BLACK MILDEW. **Lembosia illiciicola**, AL, MS.  
LEAF SPOT, Algal; Green Scurf. **Cephaleuros virescens**, LA, SC.  
SOOTY MOLD. **Capnodium footii**, MS.

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### Anoda

NECROSIS, Vascular. **Verticillium dahliae**, NM.  
NEMATODE, Cyst. **Meloidogyne hapla**.  
POWDERY MILDEW. **Oidium erysipheoides**, NM.  
RUST. **Puccinia** sp., TX.

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### Anthriscus (Chervil)

POWDERY MILDEW. **Erysiphe heraclei**, CA.  
ROT, Stem and Crown. **Sclerotinia sclerotiorum**, CA.

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### Anthurium

BACTERIAL Blight. **Xanthomonas campestris** pv. **dieffenbachiae**, CA, HI; **Ralstonia (Pseudomonas) solanacearum**, FL.  
BLACK NOSE (on flower spadix). **Colletotrichum gloeosporioides**.  
NEMATODE, Lesion. **Pratylenchus pratensis**, LA.

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### Antidesma (Chinese-Laurel)

LEAF SPOT, Algal; Green Scurf. **Cephaleuros virescens**, FL.

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### Apple (*Malus sylvestris*)

ANTHRACNOSE, Northwestern; canker; Fruit Rot. **Neofabraea malicorticis**, prevalent OR, WA, occasional CA, IL, MA, ME, MI, NE, OK.

BACTERIAL Blast, of flowers, shoots. **Pseudomonas syringae**, AR, CA; Blister Spot of bark and fruit. **P. syringae** pv. **papulans**; Rot, **P. melophthora**.

BACTERIAL Crown Gall. **Agrobacterium tumefaciens**, general; Hairy Root, **A. rhizogenes**, Central States, ID, NY.

BACTERIAL Fire Blight. **Erwinia amylovora**, general.

BLIGHT, Limb. **Corticium laetum**, LA, NC; **C. salmonicolor**, FL, LA.

BLIGHT, Southern. **Sclerotium rolfsii**, on seedlings.

BLIGHT, Thread. **Pellicularia koleroga**, WV and IN to Gulf states.

BLOTCH, Fruit; LEAF SPOT; Twig Canker. **Phyllosticta solitaria**, general except New England and the far South.

BLOTCH, Sooty, of fruit. **Gloeodes pomigena**, eastern and central states; **Geastrum polystigmatis**, NC.

CANKER, Bark; Fruit Rot. **Myxosporium corticola**, New England to MD, IL, MI, OK, OR, SD.

CANKER, Blister. **Nummularia discreta**, east of the Rocky Mts.

CANKER, Bole. **Cylindrocarpon didymium**, WA; **Leucostoma cincta**, WI.

CANKER, Crater. Cause unknown, sunken bark, crown rot, decline. WA.

CANKER; DIEBACK. **Botryosphaeria ribis** (syn. **B. dothidea**), East and South; **Cytospora** spp., widespread; **Fusarium** spp., also Fruit Rot, Pacific Northwest, Secondary to drought, winter injury, insect punctures; **Coryneum foliicola**, widespread; **Glutinium macrosporium**, OR; **Leptosphaeria coniothyrium**, East, central states, WI; **Plenodomus fuscomaculans**, CA, MI; **Sphaeropsis pyriputrescens**, WA.

CANKER, European. **Nectria galligena**, East and central states to NC and MS; Pacific Coast.

CANKER; Leaf Spot. **Monochaetia mali**, IL, NJ to SC, MO, WV; **Leucostoma cincta**, MI.

CANKER, Perennial; Bull's-Eye Fruit Rot. **Neofabraea perennans**, ID, MT, OR, WA.

CANKER; Sapwood Rot. **Hymenochaete agglutinans**, CT; **Hypoxylon** spp.

- CANKER, Scurf Bark. **Clasterosporium** sp.
- CANKER, Twig. **Coryneum foliicola**, widespread; **Gibberella baccata**; **Nectria cinnabarina**, northern U.S.
- DECLINE. **Irpex tulipiferae**, MN; **Coriolum versicolor**, also dieback, MN, WA; **Schizophyllum commune**, MN.
- FRUIT SPOT, Black Pox; Canker; Leaf Spot. **Helminthosporium papulosum**, GA, IN, MA, MS, NJ, OH, PA, WV; **Phacidiopycnis washingtonensis** (also Fruit Rot), WA.
- FRUIT SPOT, Brooks. **Mycosphaerella pomi**, New England to NC, AR, IA, MO.
- FRUIT SPOT, Flyspeck. **Microthyriella rubi**, general.
- LEAF SPOT. **Cercospora mali**, Gulf states, VT; **Coniothyrium pyrinum**; **Diaporthe perniosa**, AR; **Fabraea maculata**, IA; **Illosporium malifoliorum**, PA to NC, IN; **Mycosphaerella sentina**, IL, NJ, PA; **Pestalotia** spp., MD to NC, ID, IN; Ghost Spot, **Alternaria tenuis**, GA; **Cristulariella pyramidalis**, FL, on *Malus pumila*, **Glomerella cingulata**, TN.
- MISTLETOE. **Phoradendron serotinum** (**flavescens**), NC, TX; **Viscum album**, CA.
- NEMATODE, Lesion. **Pratylenchus penetrans**; **P. pratensis**.
- NEMATODE, Root Knot. **Meloidogyne** spp., MS, TX, UT.
- NONPARASITIC. **Bitter Pit**, **Stippen**, **Baldwin Spot**, general in storage.
- Black End**. Probably drought injury, AL, OR, WA.
- Black Heart**, of wood. Perhaps freezing injury; widespread.
- Brown Core**, in MacIntosh variety. Excessive nitrogen, low storage temperature.
- Callus Knot**. Wound overgrowth from defective union of stock and scion.
- Chlorosis**. Usually iron deficiency in alkaline western soils.
- Collar Rot**. Winter injury.
- Cork**; **Rosette**. Boron deficiency, northeastern states to IN, KY, Pacific Coast.
- Internal Bark Necrosis**. Cause unknown, possibly same as measles; general.
- Jonathan Spot**. Associated with dry weather, delayed storage.
- Leaf Scorch**. Magnesium deficiency.
- Measles**, reddish pimples in bark. Widespread; cause unknown, possibly boron deficiency in part. False measles due to manganese toxicity.
- Ozone Injury**. Pitted area in flesh.
- Rosette**; Little Leaf. Usually zinc deficiency.
- Scald**. Discoloration of fruit skin by volatile respiratory products, general in storage. Controlled by oiled paper wraps.
- Soft Scald** and **Soggy Breakdown**. Associated with delayed storage and low temperature.
- Stigmonose**. Fruit dimpling, distortion from insect punctures; widespread.
- Sunburn**, of fruit. Heat or light injury.
- Sunscauld**, of bark. Freezing injury of trunk and larger branches on side exposed to sun.
- Water-Core**. Deficient or irregular water supply.
- POWDERY MILDEW. **Podosphaera leucotricha** and **P. oxycanthae**, general.
- ROT, Bitter, of Fruit; Canker. **Glomerella cingulata**, general, especially in South, rare in West; **G. rubicola**, IL; **Colletotrichum acutatum**, AR, MI.
- ROT, Black; Frog-Eye Leaf Spot; Canker. **Physalospora obtusa**, general to the Great Plains; **P. mutila**, CA, MT, OR, WA; **P. rhodina**, KY.
- ROT, Black Root. **Botryosphaeria obtusa**, PA; **Xylaria mali**, eastern and central states.
- ROT, Brown. **Monilinia fructicola**, general except for far South; **M. laxa**, OR, WA.
- ROT, Calyx-end. **Alternaria** sp., **Sclerotinia sclerotiorum**, NH, WA.
- ROT, Crown. **Phytophthora cactorum**, MA.
- ROT, Fruit. **Alternaria mali**; **Aspergillus niger**; **Cephalosporium carpogenum**; **Corticium centrifugum**, Pacific Northwest, occasional in East; **Chaetomella** sp., WA; **Cladosporium** spp.; **Endomyces mali**; **Epicoccum granulatum**, WA; **Gloeosporium** spp.; **Glilocladium viride**, IL; **Hormodendron cladosporiodes**, WA; **Mucor piriformis**, CA, WA; **Oospora** sp.; **Phialophora malorum**, IN, VA, WA; **Pleospora fructicola**, WA; **P. herbarum**, Pacific states; **Penicillium** spp., cosmopolitan; **Phoma** spp.; **Stemphylium congestum**, WA; **Tricothecium roseum**, general; **Botrytis**

spp.; **Colletotrichum fructus**; **Rhizopus nigricans**, cosmopolitan; **Phytophthora syringae**, OR.

ROT, Fruit (Postharvest). **Botrytis cinerea**, **Phomopsis mali**, core rot, CA, NY; **Trichoderma harzianum**, MD; **Sphaeropsis pyriputrescens**, WA; **Phacidiopycnis washingtonensis**; **Potebniamyces pyri**, WA.

ROT, Heartwood. **Fomes fomentarius**; **F. igniarius**; **F. pinicola**; **Ganoderma applanatum**.

ROT, Mushroom Root. **Armillaria mellea**, prevalent on Pacific Coast; **Clitocybe tabescens**, AR, FL, TX, VA.

ROT, Postharvest Speck. **Phacidiopycnis washingtonensis**, WA.

ROT, Root. **Botryodiplodia theobromae**, AL; **Hymatotrichum omnivorum**, AK, AZ, NM, TX; **Fusarium oxysporum**, ID; **F. solani**, ID.

ROT, Silverleaf. **Stereum purpureum**, KS, ME, MN, NY, Pacific Northwest.

ROT, White Root. **Corticium galactinum**, DE to VA; AR, IL; **Rosellinia necatrix**, CA.

ROT, Wood. **Daedalea confragosa**; **Poria** spp.; **Pleurotus ulmarius**; **Pholiota adiposa**; **Polyporus** spp.; **Stereum** sp.; **Schizophyllum commune**; **Trametes** spp.

RUSSET, Fruit. **Aureobasidium pullulans** and **Rhodotorula glutinis**, NY.

RUST, **Gymnosporangium libocedri**. (0, I), on leaves, fruit; III on incense cedar, CA, OR; **Gymnosporangium nidus-avis** (0, I), on leaves, fruit, stems, IN, MD, MS, NJ; III on red-cedar.

RUST, Cedar-Apple. **Gymnosporangium juniperivirginianae** (0, I) on leaves, fruit; general east of Great Plains; III on red-cedar and Rocky Mountain juniper.

RUST, Hawthorn. **Gymnosporangium globosum** (0, I) on leaves; III on red-cedar, ME to AK, KS, NE.

RUST, Quince. **Gymnosporangium clavipes** (0, I), on fruit; III on common juniper and red-cedar.

SCAB. **Venturia inaequalis**, general.

SOOTY MOLD. **Fumago vagans**, occasional.

SPOT ANTHRACNOSE. **Elsinoë piri**, OR, WA.

VIRUS. **Apple Chlorotic Leaf Spot**; **Apple Stem Growing**; **Apple Mosaic**; **Tulare Apple Mosaic**, CA; **Tobacco Mosaic**; **Dapple Apple**, NH; **Green Mottle**, NY; **Stem-pitting**; **Tomato Ringspot**, NY; **Decline and Graft Union Necrosis**, WA.

WILT. **Verticillium albo-atrum**.

If this appalling list of diseases should make you think twice before planting apples in the backyard with the expectation of getting cheap and abundant fruit, that is all to the good. There is no easy, or cheap, road to perfect fruit. The commercial grower may, in a wet season, apply nearly 20 sprays to keep scab under control. The homeowner thinks one or two are enough. State experiment stations offer abbreviated schedules for home gardeners, tailored for the area, and if these are followed carefully, a fairly good crop can be expected. There are also all-purpose mixtures available for fruit trees, which may work reasonably well. Scab is the most important apple disease, and proper timing of early season sprays is most essential. Bitter rot, black rot, sometimes rust need attention. Fire blight control is primarily a question of proper pruning to remove infected wood, with an antibiotic spray during bloom.

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### Apple-of-Peru (*Nicandra*)

LEAF SPOT. **Cercospora physaloides**, IN.

ROT, Root. **Phymatotrichum omnivorum**, TX.

VIRUS. **Mosaic**. Unidentified, ID, IA, KY, WA, WI. Experimentally infected with several viruses; **Tomato Leaf Curl**, CA, Mexico.

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### Apricot (*Prunus armeniaca*)

BACTERIAL canker; Gummosis. **Pseudomonas syringae**, CA, OR; **Criconea mutabile**, CA.

- BACTERIAL Crown Gall.** *Agrobacterium tumefaciens*, widespread. Japanese apricot (*Prunus mume*) is resistant.
- BACTERIAL Fire Blight.** *Erwinia amylovora*, CO, FL, NE, PA, TX.
- BACTERIAL Leaf Spot.** *Xanthomonas pruni*, IL to TX, NE.
- BLACK KNOT.** *Dibotryon morbosum*, CO, IA, NY.
- BLIGHT, Blossom, Twig; Brown Rot.** *Monilinia laxa*, Pacific Coast states.
- BLIGHT, Shoot; Shot Hole; Fruit Spot.** *Coryneum carpophilum*, wide-spread; *Monilinia laxa*, MA, NY, RI.
- CANKER, Felt Fungus.** *Septobasidium pseudopedicellatum*, MS.
- CANKER, Trunk.** *Phytophthora cactorum*, CA; *P. citrophthora*, CA.
- CANKER, Trunk and Limb Gall.** *Monochaetia rosenwaldia*, CA.
- CANKER, Twig; DIEBACK.** *Cytospora* spp., AZ, NY; *Valsa leucostoma*, MO, TX; Cytosporina Dieback, *Eutypa armeniaceae* (syn. *E. lata*), CA; *Ceratocystis fimbriata*, CA.
- CANKER; DIEBACK; Coral Spot.** *Nectria cinnabarina*, IN, WA.
- FRUIT SPOT.** *Venturia cerasi* (See under ► **SCAB**).
- LEAF CURL.** *Taphrina deformans*, SC.
- LEAF SPOT.** *Cercospora circumscissa*, TX; *Coccomyces* sp., CA, MA, TX, VT; *Phyllosticta circumscissa*, CA.
- NEMATODE, Dagger.** *Xiphinema* sp., WV, NY.
- NEMATODE, Lesion.** *Pratylenchus vulnus*, CA; *P. penetrans*, NY.
- NEMATODE, Root Knot.** *Meloidogyne* sp., AZ, TX.
- NONPARASITIC. Arsenical Injury**, from accumulation in soil, CA.
- Chlorosis**, alkali injury. Mineral deficiency, AZ, CA.
- Exanthema.** Copper deficiency, CA.
- Gummosis**, Sour Sap. Adverse soil and moisture conditions, AZ, CA, NJ, WA.
- Internal Browning**, Fruit Cracking. Boron deficiency, WA.
- Little Leaf.** Zinc deficiency, CA, OR, WA.
- Mottle Leaf.** Manganese deficiency, CA.
- POWDERY MILDEW.** *Podosphaera oxycanthae*, CA, IA; *Sphaerotheca pannosa*, CA, NY.
- ROT, Blossom End; Fruit Spot.** *Alternaria* sp., and *A. citri* CA.
- ROT, Brown; Blossom Blight.** *Monilinia fructicola*, widespread on ripe fruit.
- ROT, Green Fruit; Gummosis.** *Botrytis cinerea*, CA.
- ROT, Green Fruit; Twig Blight.** *Sclerotinia sclerotiorum*, CA; *Lambertella pruni*, CA.
- ROT, Heart.** *Schizophyllum commune*, after freezing, TX, WA; *Trametes hispida*, CO.
- ROT, Mushroom Root.** *Armillaria mellea*, CA, TX; *Clitocybe tabescens*, FL.
- ROT, Root.** *Phymatotrichum omnivorum*, AZ, OK, TX.
- ROT, Silver Leaf.** *Stereum purpureum*, CA.
- RUST.** *Tranzschelia discolor* and *T. pruni* (II, III), CA, MS, NM, TX.
- SCAB; Freckle; Twig Canker.** *Cladosporium carpophilum*, wide spread.
- VIRUS. Apricot Gummosis**, WA; **Apricot Pucker Leaf**, UT; **Apricot Ring Pox**, CA, CO, WA; **Peach Mosaic**, Southwest; **Peach Phony**, GA; **Peach Ring Spot**, western U.S.; **Peach Rosette; Peach Yellow Bud Mosaic**, CA; **Peach Yellows**, occasional in East; **Stem Pitting**.
- WILT.** *Verticillium albo-atrum*, CA, UT, WA.
- Apricots are very susceptible to *Armillaria* root rot and should be on resistant Myrobalan rootstock. Bacterial canker is an epidemic disease in many seasons, with activity starting in late autumn, ceasing in early summer. Sprays are usually needed in California for zinc deficiency, brown rot, green or jacket rot, and shot hole.

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**Aquatic Plants (*Caboriaba* sp., *Limnophila* sp., *Replis diandra*, and *Potamogeton* sp.)**

**NEMATODE, Foliar.** *Aphelenchoides fragariae*, FL.

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## Arabidopsis

BACTERIAL Leaf Spot. *Xanthomonas campestris* pv. *campestris*, MI.  
 ROT, Root. *Sclerotinia minor*, NC.

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## Arabis (Rock-Cress)

BLIGHT, Gray Mold. *Botrytis cinerea*, WA.  
 CLUB ROOT. *Plasmodiophora brassicae*.  
 DAMPING-OFF. *Rhizoctonia solani*, NJ.  
 DOWNY MILDEW. *Peronospora parasitica*, AL, AK, CO, IN, MI, TX, WI.  
 LEAF SPOT. *Septoria arabis*, CO, TX.  
 ROT, Root. *Phymatotrichum omnivorum*, TX.  
 RUST. *Puccinia thlaspeos* (*P. holboelli*) (0, III), on numerous native but not cultivated species in Rocky Mountains and Pacific states; **P. monoica** (0, I) on native species, WI to CO, CA, NM, WA; II, III on *Koehleria* and *Trisetum*.  
 VIRUS. **Arabis Mosaic**.  
 WHITE RUST; White Blister. *Albugo candida*, NY to VA, CO, TX, WA.

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## Aralia, Hercules Club (*Aralia spinosa*)

CANKER; DIEBACK. *Botryosphaeria ribis*, GA, VA, WV; *Nectria cinnabarina*, VA, WV.  
 LEAF SPOT. *Cercospora atromaculans*, LA, TX; *Phyllosticta araliae*, TX; *P. everhartii*, TX, WV; *Stagonospora* sp., WV.  
 ROT, Root. *Phymatotrichum omnivorum*, TX; *Rhizoctonia solani*, TX.  
 ROT, Sapwood. *Polyporus tulipiferae*, MD.  
 SPOT ANTHRACNOSE; Scab. *Sphaceloma araliae*, MD, MO.

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## Aralia, Ming (*Polyscias*)

BLIGHT. *Alternaria panax*, FL.

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## Aralia, Sarsaparilla, American Spikenard (*Aralia hispida*, *A. nudicaulis*, *A. racemosa*)

LEAF SPOT. *Alternaria* sp., NY; *Ascochyta marginata*, WI; *Cercospora leptosperma*, IA, MI, NY, WI; *Phyllosticta decidua*, WI; *Ramularia repens*, WI; *Sclerotium deciduum*, WI.  
 POWDERY MILDEW. *Phyllactinia corylea*, MI, NE.  
 RUST. *Nyssopsora clavellosa* (III), CA, MN, OR, TX, ME to PA.  
 WILT. *Verticillium albo-atrum*, NY.

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## Aralia, Udo (*Aralia cordata*)

BLIGHT. *Alternaria* sp., DE, NJ.  
 ROT, Stem. *Sclerotinia sclerotiorum*, MD.  
 WILT. *Verticillium albo-atrum*, MD, PA.

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## Araucaria (Monkey-Puzzle, Norfolk-Island-Pine)

BACTERIAL Crown Gall. *Agrobacterium tumefaciens*, CA.  
 BLIGHT. *Cryptospora longispora*.  
 LEAF SPOT. *Pestalotia funerea*, CA, and *P. micheneri*, PA, probably secondary; *Stictis araucariae*, CA.  
 ROOT DISEASE. *Armillaria tabescens*, Mexico.  
 ROT, Root. *Cylindrocladium clavatum*, FL.

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## Arborvitae (*Thuja*)

BLIGHT, Fire. *Cercospora thuja*, on oriental arborvitae, AR, GA, LA, MS, TX.  
 BLIGHT, Gray Mold. *Botrytis cinerea*, NJ.  
 BLIGHT, Leaf. *Didymascella thuja*, TX, VT to WI.  
 BLIGHT, Nursery. *Phomopsis juniperovora*, IN, KY, OH, PA, VA; **P. occulta**, secondary.  
 BLIGHT, Snow. *Phacidium infestans*, Northeast.

BLIGHT, Twig. *Alternaria* sp.; *Mycosphaerella* sp.; *Pestalotia funerea*; *Phytophthora* sp.; *Heterosporium* sp., OR.

BLIGHT, Twig. *Coryneum berckmansii* on oriental arborvitae, OR, WA.

CANKER, Bark Patch. *Aleurodiscus amorphus*; *A. nivosus*, other species.

CANKER, Cypress. *Coryneum cardinale*, CA.

CANKER; DIEBACK. *Diplodia* sp., AL, FL.

DAMPING-OFF. *Rhizoctonia solani*, NM, NY, TX, VA.

NEEDLE CAST. *Lophodermium thujae*, ME, NH, NY, WI.

ROT, Mushroom Root. *Armillaria mellea*, MI, MS, NY, TX; *Clitocybe tabescens*, FL, LA.

ROT, Root. *Phymatotrichum omnivorum*, TX; *Fusarium solani*, TX.

ROT, Wood. *Fomes annosus*, MI; *F. roseus*, ME; *Poria vaporaria*, *P. weirii*, Great Lakes states; *Lenzites saepiaria*, MN; *Polyporus* spp.; *Schizophyllum commune*, ME; *Trametes* spp.

Giant arborvitae used for timber has many more wood rots than those listed. Oriental arborvitae in the South often looks as if blighted by fire, with nursery losses higher than in gardens. A copper spray, monthly from June to September, controls this blight. In the Northwest *Coryneum berckmansii* causes discoloration and shedding of branches, while *C. cardinale* is sporadically injurious.

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## Arctotis

LEAF BLOTCH. *Cercospora* sp., FL.

NEMATODE, Root Knot. *Meloidogyne* sp., FL.

ROT, Root. *Phymatotrichum omnivorum*, TX.

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## Ardisia

Leaf Spot, Algal. *Cephaleuros virescens*, FL.

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## Argyrea

NEMATODE, Root Knot. *Meloidogyne* sp., SC.

ROT, Root. *Phymatotrichum omnivorum*, TX.

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## Armeria (Sea-Pink, Thrift)

RUST. *Uromyces armeriae* (0, I, II, III), CA, OR.

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## Arnica

LEAF SPOT. *Ovularia hughesiana*, MT; *Phyllosticta arnicae*, CO, MT, UT, WY.

POWDERY MILDEW. *Golovinomyces cichoracearum*, CO; *Sphaerotheca macularis* (*S. humuli* var. *fuliginea*), AK, CA, WA, WY.

RUST. *Puccinia arnicalis* (II III) AK, to MT, CA, CO; 0, I unknown; *Uromyces junci* (0, I), CA, CO, MT, OR, SD, WY; II, III on *Juncus* spp.

SMUT, White. *Entyloma arnicale*, AK, CO, ID, MT, UT, WA, WY.

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## Arrow-Arum (*Peltandra*)

LEAF SPOT. *Cercospora callae*, AL, DE, FL, NY; *Colletotrichum* sp., AL; *Gloeosporium paludosum*, DE, IN, MA, NY; *Pestalotia aquatica*, secondary; *Ramularia* sp., MI.

RUST. *Uromyces ari-triphylli* (*U. caladii*) (0, I, II, III), MA to FL, IL, IN, IA.

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## Arrowhead (*Sagittaria*)

LEAF SPOT. *Cercospora alismatis* VT to AL, TX, WI; *Didymaria alismatis*, *Gloeosporium confuens*, IA, MA, TX, WI; *Marssonina* sp., LA.

SMUT, Leaf. *Burrillia pustulata*, IL, NE, WI; *Doassansia deformans*, MA to NJ, FL, MO, SD, TX; *D. furva*, WI; *D. intermedia*, IA,

MN, NH, ND, WI; **D. obscura**, CT, MA; **D. opaca**, MA to DE, IL, WI; **D. sagittariae**, CT to KS, AR, MT, TX, WY.

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### Arrowroot (*Maranta*)

LEAF SPOT. **Glomerella cingulata**, MD, NJ.  
RUST. **Puccinia thaliae** (*P. cannae*) (II, III), FL.

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### Artemisia (Wormwood)

BLIGHT, Leaf. **Cercospora olivacea**, NJ, NY, ND; **Systemma artemisiae**, black pustule, PA.  
DOWNY MILDEW. **Peronospora leptosperma**, IA, MN, ND, SD, WI.  
GALL, Leaf. **Synchytrium aureum**, WI.  
LEAF SPOT. **Cercospora ferruginae**, NY, WI; **Gloeosporium heterophyllum**, CA.  
LEAF-HAIRS, DISCOLORATION. **Nematostoma artemisiae**, MO.  
NEMATODE, Root Knot. **Meloidogyne** sp., FL.  
POWDERY MILDEW. **Golovinomyces cichoracearum**, CA, IA, SD, TX.  
ROT, Root. **Phymatotrichum omnivorum**, TX.  
ROT, Root and Crown. **Fusarium solani**, CA.  
RUST. **Puccinia tanacetii** (*P. absinthii*) (0, I, II, III), CA; **P. atrofusca** (0, I) ND; II, III on *Carex* spp.; **P. millefolii** (III), CA; **P. similis**, ID, OR.  
VIRUS. **Tomato Spotted Wilt**, PA.  
WHITE RUST. **Albugo tragopogonis**, IA, MT, ND, SD, TX, WI.

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### Artichoke, Globe (*Cynara scolymus*)

BLIGHT, Gray Mold. **Botrytis cinerea**, CA, NY.  
BLIGHT, Southern. **Sclerotium rolfsii**, GA.  
LEAF SPOT. **Cercospora obscura**, CA, TX; **Cladosporium** sp., CA, SC; **Ramularia cynarae**, CA, prevalent.  
NEMATODE, Root Knot. **Meloidogyne** sp., CA.  
POWDERY MILDEW. **Golovinomyces cichoracearum**, CA, NJ.  
ROT, Root. **Phytophthora megasperma**, CA; **Phymatotrichum omnivorum**, TX.; **Pythium aphanidermatum**, CA.

ROT, Root and Stem. **Rhizoctonia solani**, MS, TX; **Sclerotinia sclerotiorum**, OR.  
VIRUS. **Artichoke Curly Dwarf**; **Artichoke Latent**, CA.  
WILT. **Verticillium dahliae**, CA.

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### Artichoke, Jerusalem (*Helianthus tuberosus*)

BACTERIAL Leaf Spot. **Pseudomonas syringae** pv. **tagetis**, MN.  
BACTERIAL Spot. **Pseudomonas helianthi**, IL.  
BLIGHT, Southern. **Sclerotium rolfsii**, CA, FL, LA, MS, SC, TX.  
DOWNY MILDEW. **Plasmopara halstedii**, VT and NJ to KS, SD.  
LEAF SPOT. **Cercospora helianthi**, KS; **Septoria helianthi**, IL, IA, WI.  
NEMATODE, Root Knot. **Meloidogyne** spp., CA, FL, MD, NY, SC, TN.  
POWDERY MILDEW. **Golovinomyces cichoracearum**, general.  
ROT, Root. **Phymatotrichum omnivorum**, AZ, TX; **Rhizopus stolonifer**, MS.  
ROT, Stem; Wilt. **Sclerotinia sclerotiorum**, MA, MN, WA.  
RUST. **Coleosporium helianthi** (II, III), AL, IL, NY, NC, OK, PA, SC, TN, VA; **Puccinia helianthi** (0, I, II, III), general; **Uromyces junci**, (0, I), NE, ND.

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### Artillery Plant, Aluminum Plant (*Pilea*)

BACTERIAL Leaf Spot. **Xanthomonas campestris**, FL.  
BLIGHT, Leaf, Stem, and Bud. **Phytophthora parasitica**, FL.  
NEMATODE, Root Knot. **Meloidogyne** sp., FL.  
LEAF SPOT. **Myrothecium roridum**, FL; **Septoria pileae**, IL, IN, IA, MI, MO, NY, WI.  
ROT. **Rhizoctonia** sp., FL.

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### Artocarpus (Breadfruit)

RUST. **Uredo artocarpi** (11), HI.



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### Arugula (*Eruca sativa*)

BACTERIAL Blight. **Pseudomonas syringae** pv. **alisalensis**, CA, NV.

BACTERIAL Leaf Spot. **Pseudomonas syringae**, CA.

DOWNY MILDEW. **Peronospora parasitica**, CA.

WHITE RUST. **Albugo candida**, CA.

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### Arundo (Giant Reed)

LEAF SPOT; Stem Speckle. **Selenophoma donacis**, CA.

LEAF SPOT; Cane "Anthracnose"; Dieback. **Papularia sphaerosperma**, general. **P. odora**, KS; **Phyllosticta tuberosa**, OK.

ROT, Root. **Armillaria mellea**, MD.

RUST. **Puccinia chloridis** (*P. bartholomaei*) (0, I), KS, OK, TX; II, III on *Bouteloua* spp.; **Uromyces asclepiadis** (II, III), KS, NM, TX.

RUST, Crown. **Puccinia coronata**, CA.

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### Ash (*Fraxinus*)

ANTHRACNOSE, Leaf Scorch. **Discula fraxinea**, DE, LA, OR; **Gloeosporium aridum**, eastern and central states.

BACTERIAL Decline. **MLO**, IL, IN, IA, NY.

BACTERIAL Hairy Root. **Agrobacterium rhizogenes**, IA, NE to OK.

BACTERIAL Phytoplasma. **Ash Yellows, Witches' Broom**, MI, MT, NE, NC, SD.

BLACK MILDEW. **Dimerosporium pulchrum** (*Sarcinella heterospora*).

BLIGHT, Seedling. **Rhizoctonia solani**, OK.

CANKER, Bark Patch. **Aleurodiscus** spp., eastern states; **Felt Fungus, Septobasidium** spp., NC to FL.

CANKER, Branch, Trunk. **Dothiorella fraxinicola**, IA, KS, NE; **Sphaeropsis** sp., widespread; **Nectria cinnabarina**; **N. coccinea**, Northeast.

CANKER, Coin. **Phyctema vagabunda**, MT, Ontario, Canada.

CANKER; DIEBACK. **Cytospora annularis**, north central states; **Diplodia infuscans**, Northeast; **Cytophoma pruinosa** and **Fusicoccum** sp., may be secondary, Northeast.

DECLINE. **Togninia fraxinopennsylvanica**, Anamorph, **Phaeoacremonium mortoniae**, CA.

DODDER. **Cuscuta** sp.

LEAF SPOT. **Cercospora fraxinites**, AL, FL, LA, TX; **Cylindrosporium fraxini** (including reports of *Marssonina fraxini*, *Piggotia fraxini*), widespread; **Mycosphaerella effigurata**, widespread; **M. fraxinicola**; **Actinopelte dryina**; **Cytospora** sp., VA.

MEASLES. **Togninia fraxinopennsylvanica** Anamorph, **Phaeoacremonium mortoniae**, CA.

MISTLETOE. **Phoradendron serotinum** (**flavescens**), south central to Pacific states; **Viscum album**, CA, on *Fraxinus velutina* (Arizona Ash).

MISTLETOE, European. **Viscum album** on Arizona ash, CA.

NEMATODE. **Meloidogyne** spp., AZ, MD, OK.

NEMATODE, Dagger. **Xiphinema americanum**, SD on Green Ash.

POWDERY MILDEW. **Phyllactinia corylea**, north-eastern, central, Pacific Coast states. **Uncinula circinata**, IA; **Microsphaera alni**, IL.

ROT, Collar. **Helicobasidium purpureum**, TX.

ROT, Root. **Phymatotrichum omnivorum**, AZ, TX.

ROT, Sapwood. **Lentinus tigrinus**, MS.

ROT, White Mottled Heart, Stem. **Fomes fraxinophilus**, eastern and central states to Great Plains; many other species of *Fomes*.

ROT, Wood. **Daldinia concentrica**, cosmopolitan; **Daedalea** spp.; **Ganoderma lucidum**, LA, MS; **Polyporus** spp.; **Poria** spp.; **Schizophyllum commune**, cosmopolitan; **Trametes** spp.

RUST. **Puccinia sparganioides** (0, I), general east of Great Plains; II, III on marsh grass (*Spartina* spp.).

VIRUS. **Ash Ring Spot**, NY; **Tobacco Mosaic Virus**, MA, NY; **Tobacco Ring Spot Virus**, NY.

WILT. **Verticillium albo-atrum**, CO; **V. dahliae**, OR.

Ash rust is epidemic in New England in many seasons, causing defoliation and sometimes death of trees. Anthracnose and leaf spots may be important in a wet season.

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### Ash, Moraine (*Fraxinus holotriocho*)

VIRUS. Tobacco Mosaic, NY; Tobacco Ringspot, NY.

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### Asparagus (*Asparagus officinalis*)

ANTHRACNOSE; Canker. **Colletotrichum** sp., AL, CT, IL.

BACTERIAL Soft Rot. **Erwinia carotovora**, general.

BLIGHT, Ashy Stem. **Macrophomina phaseoli**, TX.

BLIGHT, Branchlet; DIEBACK. **Alternaria** sp., IL, MA, NY, OK, SC; **Stemphylium botryosum**, secondary; **Ascochyta** sp., DE, TX.

BLIGHT, Gray Mold, Shoot. **Botrytis cinerea**, CA, IL, MA, NY, WV.

CANKER; Stem Spot. **Phoma asparagi**.

DAMPING-OFF; Stem Canker. **Rhizoctonia solani**, occasional.

LEAF SPOT. **Cercospora asparagi**, general; **Pleospora herbarum**; **P. allii** Anamorph, **Stemphylium vesicarium**, MI, OK, WA.

NEMATODE, Root Knot. **Meloidogyne** sp., SC. Usually resistant.

ROT, Crown. **Penicillium martensii**, WA; **Penicillium** sp., blue mold rot.

ROT, Mushroom Root. **Armillaria mellea**, OR.

ROT, Root; Stem Wilt; Decline. **Fusarium oxysporum** f. sp. **asparagi**, CA, SC, WA; **Fusarium proliferatum**, CT; **Fusarium** sp.; **Phytophthora** sp., MI; **P. megasperma**, Montreal, Canada; **P. asparagi**, MI.

ROT, Stem. **Diplodia asparagi**; **Phytophthora** sp., CA.

ROT, Watery Soft. **Sclerotinia sclerotiorum**, occasional in South.

RUST. **Puccinia asparagi** (0, I, II, III), general on susceptible varieties. Rust is the most important asparagus disease, and resistant varieties are sometimes disappointing.

VIRUS. Asparagus I, DE, MI, NJ; Asparagus II, DE; Tobacco Streak.

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### Asparagus Fern (*Asparagus plumosus*)

CANKER, Stem; Blight. **Ascochyta asparagina**, FL, TX; **Phoma** sp., FL.

LEAF MOLD. **Cladosporium** sp., FL, MS, TX.

NEMATODE, Root Knot. **Meloidogyne** spp., FL.

NEMATODE, Spiral. **Helicotylenchus nannus**.

NONPARASITIC "Rust". Cause undetermined, FL.

ROT, Root; Wilt. **Fusarium** sp., FL, WA.

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### Asparagus, Florists' Smilax (*Asparagus asparagoides*)

BLIGHT, Gray Mold. **Botrytis cinerea**, AK.

LEAF SPOT. **Stagonospora smilacis**, WI.

ROT, Root; Wilt. **Fusarium** sp., NJ.

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### Asparagus, Sprenger (*Asparagus sprengeri*)

BACTERIAL Crown Gall; Fasciation.

**Agrobacterium tumefaciens** (possibly confused with *Clavibacter fascians*).

NEMATODE, Root Knot. **Meloidogyne** spp., CA.

ROT, Root. **Rhizoctonia solani**, NY.

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### Asparagus Tree Fern (*Asparagus virgatus*)

BACTERIAL, Water Soaked Lesions.

**Xanthomonas translucens** pv. **undulosa**, MI.

BACTERIAL LESION. **Xanthomonas campestris**, FL.

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## Aspidistra

BLIGHT, Leaf. **Labrella aspidistrae**, IL, LA.

LEAF SPOT. **Ascochyta aspidistrae**, MN, NJ;

**Colletotrichum omnivorum**, CA, MO, NJ,  
PA, WV.

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## Aster, China (*Callistephus*)

ANTHRACNOSE. **Colletotrichum** sp., FL.

BACTERIAL, MLO. **Aster Yellows**, general.

BLIGHT, Bud, Stem; Gray Mold. **Botrytis cinerea**,  
AK, CA, CT, IL, NJ, NY, PA, WI.

BLIGHT, Petal. **Itersonilia perplexans**, FL.

BLIGHT, Southern. **Sclerotium rolfsii**, MS, NC.

CANKER, Stem. **Phomopsis callistephi**, IL, WI.

DODDER, **Cuscuta** spp., widespread.

DOWNY MILDEW. **Basidiophora entospora**, FL,  
TX.

LEAF SPOT. **Ascochyta asteris**, CA, NY, ND, OH;  
**Septoria callistephi**, AL, DE, MI, MO, NJ,  
NY, OH, PA.

MOLD, Seed. **Pleospora herbarum**, cosmopolitan;  
**Alternaria** sp.

NEMATODE, Root Knot. **Meloidogyne** sp., CT, FL,  
TX, WA.

POWDERY MILDEW. **Golovinomyces**  
**cichoracearum**, DE, MN, NE, NC, TN, VT,  
WA; **Erysiphe polygoni**, NJ.

ROT, Foot. **Phytophthora cryptogea**; **Pythium**  
**ultimum**.

ROT, Root and Stem; Leaf Blight. **Rhizoctonia**  
**solani**, widespread, chiefly in northeastern and  
central states; **Phymatotrichum omnivorum**,  
TX.

RUST. **Coleosporium asterum** (*C. solidaginis*)  
(II, III), general except far South; II, III on  
two- and three-needle pines.

VIRUS. **Beet Curly Top**, OR; **Tobacco Rattle**  
(aster strain of); **Tomato Spotted Wilt**, CA;  
**Bidens Mottle**, FL.

WILT. **Verticillium** sp., CA, CT, IL, MA, NY.

WILT, Stem Rot. **Fusarium oxysporum** f. sp.  
**callistephi**, general.

*Fusarium* wilt and aster yellows are the two  
principal diseases. Choose wilt-resistant varieties

or plant in a new location. Rogue plants with  
yellows immediately; use systemic insecticides  
to control insect vectors.

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## Aster, Perennial (*Aster* spp.)

BACTERIAL Crown Gall. **Agrobacterium**  
**tumefaciens**, CT.

BLACK KNOT. **Gibberidea heliopsidis**, NE, NY,  
ND, WI.

BLIGHT, Gray Mold. **Botrytis cinerea**, AK, CT, NJ.

DODDER. **Cuscuta** spp., eastern and central states.

DOWNY MILDEW. **Basidiophora entospora**, IL,  
IN, MD, MO, NE, WI.

GALL, LEAF. **Synchytrium nigrescens**, WI.

LEAF SPOT. **Alternaria** sp., MI, TX, VT; **Ascochyta**  
**compositarum**, WI; **Cercospora asterata**, AL,  
TX; **Cercospora cana**, OR, WI;  
**Leptothyrium doelligeriae**, NY; **Ovularia**  
**asteris**, WY; **O. virgaureae**, CO, MS, WI;  
**Phyllachora sterigena**, KS, NE; **Ramularia**  
**asteris**, IA, MI, NE, TX, WI, WY; **Septoria**  
**angularis** and other species; **Phyllosticta**  
**astericola**, TX.

LEAF SPOT, Black, Tar. **Placosphaeria haydeni**  
(*Discosphaerina pseudimantia*), IA, NJ, NY,  
ND.

NEMATODE, Leaf. **Aphelenchoides ritzemabosi**,  
CT.

NEMATODE, Root Knot. **Meloidogyne** sp.

PARASITIC LICHEN. **Strigula elegans**,  
**S. complanata**, LA, Southern U.S.

POWDERY MILDEW. **Golovinomyces**  
**cichoracearum**, general.

ROT, Root. **Phymatotrichum omnivorum**, TX.

ROT, Stem. **Sclerotinia sclerotiorum**, CT.

RUST. **Coleosporium asterum** (II, III); **Puccinia**  
**asteris** (III), general; **P. dioicae** var. **asteris**  
(0, I); II, III on sedge; **P. grindeliae** (III), CO,  
KS, NV, WY; **P. stipae** (0, I), CO, IA, KS, NE,  
ND, SD; **Uromyces compactus**, AZ, NM,  
TX; **U. junci** (0, I), NH.

SMUT, White. **Entyloma aster-seriacearum**,  
WI; **E. compositarum**, ME, MA, SD, WI.

VIRUS. **Aster Chlorotic Stunt**; **Mosaic**.  
Unidentified, CA; **Tomato Spotted Wilt**, CA.

WILT. **Verticillium albo-atrum**, CT.

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## Astilbe

POWDERY MILDEW. *Erysiphe polygoni*, MA.

ROT, Petiole. *Sclerotium rolfsii* var. *delphinii*, IA.

VIRUS. **Tobacco Ringspot**, MN.

WILT. *Fusarium* sp., WA.

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## Astragalus

RUST. *Uromyces punctatus*, ID, OR.

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## Aubrietta

VIRUS. **Tomato Spotted Wilt**, PA.

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## Aucuba (Gold-Dust Tree)

ANTHRACNOSE; Leaf Spot. *Gloeosporium* sp. (*Glomerella cingulata*), NJ, PA, SC, WA. Probably includes reports of *Colletotrichum pollaci*, MS, NJ.

LEAF SPOT. *Pestalotia aucubae*, secondary; *Phyllosticta aucubae*, CA, MS, SC.

ROT, Root. *Phytophthora cinnamomi*, *P. citricola*, NC.

VIRUS. **Tobacco Mosaic**, Aucuba strain.

WILT. *Verticillium albo-atrum*, NJ.

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## Autumn Crocus (*Colchicum*)

BLIGHT; Leaf Spot. *Botrytis elliptica*, WA.

SMUT, Leaf. *Urocystis colchici*, DE, NY, OH, PA, WA.

VIRUS. **Tobacco Ring Spot Virus**, MD.

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## Avocado (*Persea americana*)

ANTHRACNOSE; Leaf and Fruit Spot; Black Rot. *Glomerella cingulata*, Mexico, general; *Colletotrichum gloeosporioides*, Mexico.

BACTERIAL CANKER. *Xanthomonas campestris*, CA.

BACTERIAL Crown Gall. *Agrobacterium tumefaciens*, CA.

BACTERIAL Fruit Blast. *Pseudomonas syringae*, CA.

BLACK MILDEW. *Irene perseae*, FL.

BLACK STREAK. No causal agent has been identified, FL.

BLIGHT, Seedling. *Sclerotium rolfsii*, FL; *Phytophthora palmivora*, FL.

BLOTCH, Fruit Spot. *Cercospora perseae*, FL; *C. purpurea*.

CANKER, Branch; *Dothiorella* Fruit Rot. *Botryosphaeria ribis* var. *chromogena*, CA; *Neofusicoccum austral*, N. *luteum*, and *N. parvum*, CA.

LEAF SPOT. *Phyllosticta micropuncta*, AL, FL.

LEAF SPOT; Algal; Green Scurf. *Cephaleuros virescens*, FL.

LEAF SPOT; Fruit Spot; Seedling Blight. *Pestalotia* spp., general.

LEAF SPOT; Smudgy Spot on Twigs. *Helminthosporium* sp., CA.

NEMATODE, Burrowing. *Radopholus similis*, FL.

NEMATODE, Dagger. *Xiphinema americanum*.

NEMATODE, Meadow. *Pratylenchus brachyurus*; *P. vulnus*.

NEMATODE, Root Knot. *Meloidogyne* sp., resistant to.

NEMATODE, Stubby Root. *Trichodorus christiei*.

NONPARASITIC. **Carpace Spot**. Abrasion of young fruits.

**Dieback**. Copper deficiency.

**End Spot**. Dessication of young fruits; overmaturity.

**Little Leaf; Rosette**. Zinc deficiency.

**Melanorhiza**. Defective drainage and aeration.

**Mottle Leaf**. Nutritional deficiency.

**Tipburn**. Sometimes salt accumulation in poorly drained soil.

ROT, Blue Mold. *Penicillium expansum*, CA.

ROT, Collar; Trunk Canker. *Phytophthora cactorum* CA; *P. parasitica* FL; *Sclerotinia sclerotiorum*, CA.

ROT, Fruit. *Diplodia theobromae*, FL; *Phomopsis* sp., FL, TX; *Phytophthora*

**citrophthora**, CA; **P. citricola**, CA; **Rhizopus nigricans**; **Alternaria** sp.; **Fusarium** sp.  
 ROT, Postharvest Stem. **Pestalotiopsis clavispora**, Chile.

ROT, Root. **Armillaria mellea**, CA; **Clitocybe tabescens**, FL; **Phymatotrichum omnivorum**, TX; **Dematophora** Rot, **Rosellinia necatrix**.

ROT, Root; Decline. **Phytophthora cinnamomi**, CA; **Pythium** spp., CA.

ROT, Seed and Root. **Rhizoctonia solani**, CA.

SPOT ANTHRACNOSE; Scab. **Sphaceloma perseae**, FL, TX.

VIROID. **Avocado Sunblotch**, Michoacan, Mexico.

VIRUS. **Avocado Sun Blotch**, CA; **Avocado 3 Alphacryptovirus**., CA, black streak.

WILT. **Verticillium albo-atrum**, CA, FL; **Raffaelea lauricola**, FL.

WILT, Laurel. **Raffaelea lauricola**; **R. canadensis**, CA, FL.

WILT, Root. **Neonectria radicola**, CA.

Avocado scab may cause heavy damage in susceptible varieties of West Indian stock. *Cercospora* blotch attacks both leaves and fruit. Decline, root rot, is most serious in wet soils, killing trees if they are waterlogged 6 to 8 days.

## Azalea (*Rhododendron*)

ANTHRACNOSE. **Colletotrichum** sp., LA.

BLIGHT, Bud and Twig. **Briosia azaleae** (*Pycnostysanus*), MA, NH, NJ, NC.

BLIGHT, Cutting. **Cylindrocladium scoparium**, AL, FL, NY, OH; **C. floridanum**.

BLIGHT, Flower; Seedling. **Botrytis cinerea**, often after frost, cosmopolitan; **Alternaria tenuis**; **Cladosporium herbarum**; **Epicoccum purpurascens**.

BLIGHT, Foliar. **Phytophthora foliarum**, TN.

BLIGHT, Petal; Flower Spot. **Ovulinia azaleae**, AL, CA, FL, GA, LA, MD, MS, NC, PA, SC, TX, VA; also NY, NJ in greenhouses.

BLIGHT, Shoot. **Monilinia azaleae**, GA, MA, NY.

BLIGHT, Shoot and Stem. *Phytophthora citrophthora*, *P. citricola*, *P. nicotianae* var. *parasitica*, FL, OH.

BLIGHT, Thread. **Pellicularia koleroga**, LA.

CANKER, Stem. **Gloeosporium** sp., OR. **Phomopsis** sp., SC.

DAMPING-OFF, Leaf Blight. **Rhizoctonia solani**, cosmopolitan.

DODDER. **Cuscuta** sp., FL, SC.

GALL, Leaf; Shoot Hypertrophy. **Exobasidium vaccinii**, general; **E. burtii**, **Yellow Leaf Spot**, ID, NJ, OR, WA; **Synchytrium vaccinii**, NJ.

LEAF SCORCH; Angular Leaf Spot. **Septoria azaleae**, widespread; severe in CA.

LEAF SPOT. **Cercospora rhododendri**, MD; **Pestalotia** spp., general but secondary; **Phyllosticta** sp.; **Ramularia angustata**, MS, NY; **Colletotrichum azaleae**, FL; **Septoria solitaria**, CA, OR, TX; Tar Spot, **Melasmia menziesii**, WA; **Corynespora cassiicola**, GA, FL.

NEMATODE, Leaf. **Aphelenchoides fragariae**, FL.

NEMATODE, Root Knot. **Meloidogyne incognita**.

NEMATODE, Spiral. **Helicotylenchus nannus**; **Rotylenchus robustus**.

NEMATODE, Stubby Root. **Paratrichodorus christiei**; **Trichodorus primitivus**.

NEMATODE, Stunt. **Tylenchorhynchus claytoni**.

NONPARASITIC. **Chlorosis**. Usually iron deficiency, general in alkaline soils, sometimes defective drainage.

POWDERY MILDEW. **Erysiphe azaleae**, LA; **Erysiphe polygoni**, CA, NJ; **Microsphaera alni**, GA, NJ, NY, PA, RI, VA.

ROT, Root. **Armillaria mellea**, CA, NJ, WA; **Clitocybe tabescens**, FL; **Phymatotrichum omnivorum**, TX; **Pythium** spp.; **Phytophthora lateralis**, NC.

ROT, Root and Stem; Wilt. **Phytophthora cinnamomi**, AL, MD, MO.

RUST. **Pucciniastrum myrtilli** (II, III), ME to FL, TX; 0, I on hemlock.

VIRUS. **Tomato Spotted Wilt**, PA.

WILT. **Cylindrocarpon radicola**, MA.

Azalea flower spot or petal blight devastates azalea blooms in the South in rainy

or foggy weather starting when buds show color. Bud and twig blight has killed some shrubs in Massachusetts. Leaf galls are unsightly but not too serious. Leaf scorch may be prevalent in a rainy season. Powdery mildew is common on deciduous azaleas in late summer.

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### Azara

ROT, Stem. *Sclerotium rolfsii*, CA.

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### Babiana

VIRUS. *Iris Mosaic*, CA.

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### Bald Cypress (*Taxodium*)

BLIGHT, Twig. *Pestalotia funerea*, TX.

CANKER, Felt Fungus. *Septobasidium* spp., LA.

ROT, Brown Pocket Heart. *Fomes geotropus*, cause of "pecky cypress," FL to LA;

*F. extensus*; *Ganoderma applanatum*.

ROT, Root. *Phymatotrichum omnivorum*, TX.

ROT, Wood. *Lenzites* spp., *Polyporus* spp., *Poria* spp.

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### Balm (*Melissa*)

BLIGHT, Gray Mold. *Botrytis cinerea*, AK.

LEAF SPOT. *Phyllosticta decidua*, NY.

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### Balsam-Apple, Balsam-Pear (*Momordica*)

ANTHRACNOSE. *Colletotrichum lagenarium*, IN.

DOWNY MILDEW. *Pseudoperonospora cubensis*, IA.

LEAF SPOT; Blight. *Ramularia momordicae*, TX.

NEMATODE, Burrowing. *Radopholus similis*, FL.

NEMATODE, Root Knot. *Meloidogyne* sp., FL.

POWDERY MILDEW. *Golovinomyces cichoracearum*, WI.

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### Balsam-Root (*Balsamorhiza*)

LEAF SPOT. *Septoria* sp., WA.

NEMATODE, Leaf Gall. *Anguina balsamophila*, UT.

POWDERY MILDEW. *Golovinomyces cichoracearum*, WY.

RUST. *Puccinia balsamorhizae* (0, I, II, III), general.

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### Bamboo (*Bambusa*, *Phyllostachys*)

BLACK MILDEW. *Meliola tenuis*.

BLIGHT, Tip. *Diplodia bambusae*, LA, TX.

LEAF MOLD. *Cladosporium gramineum*, OR, SC.

LEAF SPOT. *Helminthosporium* sp., FL; *Mycosphaerella* sp., CA; Culm Spot, *Selenophoma donacis*, CA.

NEMATODE, Burrowing. *Radopholus similis*, FL.

RUST. *Kweilingia divina*, CA, HI, Brazil, Colombia; *Puccinia melanocephala* (II, III), FL, GA, MS, TX; *Uredo ignava* (II), FL, GA; *Uromyces costaricensis*, FL on Wild Bamboo (*Lasiacis divaricata*).

SMUT. *Ustilago shiraiana*, CA, FL, LA, TX.

VIRUS. *Bamboo Mosaic*, CA; *Sugarcane Mosaic Virus*, LA, on *Arundinaria gigantea*.

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### Banana (*Musa*)

ANTHRACNOSE; Fruit Rot. *Gloeosporium musarum*, FL, TX.

BACTERIAL Leaf Blight. *Pseudomonas solanacearum*, FL.

BLACK SIGATOKA. *Mycosphaerella fijiensis*, FL; Grand Bahama Island, Puerto Rico.

FUZZY PEDICEL. *Sporothrix* spp., *Fusarium pseudocircinatum*, FL.

LEAF SPOT, Black. *Deightonella*, GA.

NEMATODE, Burrowing. *Radopholus similis*, FL, LA.

NEMATODE, Lesion. *Pratylenchus musicola*, FL.

NEMATODE, Root Knot. *Meloidogyne* spp., FL, TX.

ROT, Root. *Clitocybe tabescens*, FL;  
*Ceratobasidium*, GA.  
 VIRUS. Cucumber Mosaic, FL.  
 WILT. *Fusarium oxysporum* f. sp. *cubense*, FL.

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### Banana Shrub (*Michelia figo*)

POWDERY MILDEW. *Oidium* sp., LA.

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### Baneberry, Cohosh (*Actaea*)

LEAF SPOT. *Ascochyta actaeae*, WI; *Ramularia actaeae*, CO, IA, NM, VT, WI.  
 RUST. *Puccinia recondita* (0, I), NY to VA, IL, WA; II, III on grasses.  
 SMUT, Leaf and Stem. *Urocystis carcinodes*, ID, PA, UT, WV.

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### Baptisia (False Indigo)

LEAF SPOT. *Cercospora velutina*, IL, KS, WI;  
*Marssonina baptisiae*, IA; *Septoria baptisiae*, SC, TX; *Stagonospora baptisiae*, SC.  
 POWDERY MILDEW. *Erysiphe polygoni*, prevalent;  
*Microsphaera alni*, WI.  
 ROT, Root. *Armillaria mellea*, CA;  
*Phymatotrichum omnivorum*, TX.  
 RUST. *Puccinia andropogonis*, KS, NE, NC, OK.  
 RUST, Soybean. *Phakopsora pachyrhizi*, southern U.S.

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### Barberry (*Berberis*)

BACTERIAL Leaf Spot. *Pseudomonas berberidis*, general.  
 BLIGHT, Gray Mold. *Botrytis cinerea*, CA, MO.  
 CANKER; DIEBACK. *Botryosphaeria ribis*, FL.  
 DAMPING-OFF. *Pythium debaryanum*, CA.  
 LEAF SPOT. *Gloeosporium berberidis*, CT, MA, MN, OH, WI; *Phyllosticta berberidis*, KY.  
 NEMATODE, Root Knot. *Meloidogyne hapla*.  
 NEMATODE, Spiral. *Rotylenchus buxophilus*.  
 POWDERY MILDEW. *Erysiphe polygoni*;  
*Phyllactinia corylea*, MA, VT.

ROT, Heart. *Poria punctata*, MD.  
 ROT, Root. *Phymatotrichum omnivorum*, TX.  
 RUST. *Cumminsia sanguinea* (0, I, II, III), OR;  
*Puccinia koeleriae* (0, I); II, III on Koehleria;  
*P. montanensis* (0, I); II, III on grasses.  
 RUST, Stripe. *Puccinia striiformis*, MN.  
 RUST, Wheat, *Puccinia graminis* (0, I), general;  
 II, III on cereals and grasses.  
 VIRUS. Tomato Spotted Wilt, PA.  
 WILT. *Verticillium albo-atrum*, CT to VA, IL, MI.

All interstate movement of barberry is under quarantine because of the wheat rust, but resistant cultivars may be shipped under permit. Common barberry is eradicated near wheat fields; Japanese barberry is resistant to rust.

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### Barley

BLOTCH, Net. *Pyrenophora teres*, ND.  
 ERGOT. *Claviceps purpurea*, ND.  
 NEMATODE, Cereal Cyst. *Heterodera filipjevi*, OR, Pacific Northwest.  
 VIRUS. Oat Blue Dwarf, upper Midwest, United States.

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### Barren-Strawberry (*Waldsteinia*)

LEAF SPOT. *Ramularia waldsteiniae*, WI;  
*Septoria waldsteiniae*, MI, NY, VT.  
 RUST. *Puccinia waldsteiniae*, ID, MI, NY, VT, WI.  
 SMUT. *Urocystis (Whetzella) waldsteiniae*, NY, WI.

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### Barrenwort (*Epimedium*)

VIRUS. Tobacco Rattle, MA, MI, MN.

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### Basil (*Ocimum*)

BACTERIAL Leaf Spot. *Pseudomonas cichorii*, LA; *P. viridiflava*, CA.  
 BLACK Leg. *Pleotorsporium tabacinum*, IN.

DOWNY MILDEW. *Peronospora* sp., CA, FL, MA.  
NEMATODE, Root Knot. *Meloidogyne* sp., FL; *M. incognita acrita*, CA.

NONPATHOGENIC. Hydroponically grown chlorosis (interveinal), CO<sub>2</sub> enrichment, IL.

ROT, Basal. *Rhizoctonia solani*, HI.

ROT, Root. *Phytophthora dreschleri*, NC; *Pythium irregulare*, FL.

ROT, Stem. *Sclerotinia sclerotiorum*, LA, also dieback, CA; *S. minor*, CA, also crown.

SPOT, Black. *Colletotrichum gloeosporioides*, FL.

VIRUS. Bromegrass Mosaic Virus, general, IA, SD; Tomato Spotted Wilt, LA, PA.

WILT. *Fusarium oxysporum* f. sp. *basilicum*, CA, FL, HI, LA, MD, MA, SC; *Sclerotinia sclerotiorum*.

### **Bauhinia (Orchid-Tree, Mountain Ebony)**

LEAF SPOT. *Colletotrichum* sp., TX; *Phyllosticta* sp., FL.

POWDERY MILDEW. *Microsphaera diffusa*, MD.

### **Bayberry (*Myrica carolinensis*)**

LEAF SPOT. *Mycosphaerella myricae*, GA, MS; *Phyllosticta myricae*, NY.

RUST. *Gymnosporangium ellisii* (0, I), MA to NY, VA; III on *Chamaecyparis*.

VIRUS. Bayberry Yellows, NJ.

### **Bean, Adzuki (*Phaseolus angularis*)**

BACTERIAL Stem Rot. *Pseudomonas adzukicola*, MN.

### **Bean, Asparagus, Yardlong (*Vigna sesquipedalis*)**

BACTERIAL Spot. *Pseudomonas syringae*, IN, NY.

LEAF SPOT. *Mycosphaerella cruenta*, VA.

LEAF SPOT; Pod Spot. *Cladosporium vigneae*, IN.

POWDERY MILDEW. *Erysiphe polygoni*, CA.

VIRUS. Potato Virus X, work at the University of Wisconsin on *V. unguiculata* spp. *cylindrica* "Catjang," *V. unguiculata* spp. *sesquipedalis*, *V. unguiculata* spp. *unguiculata*.

### **Bean, Faba (*Vicia*)**

VIRUS. Bidens Mottle, FL.

### **Bean, Kidney, Lima (*Phaseolus vulgaris*, *P. limensis*)**

ANTHRACNOSE. *Colletotrichum lindemuthianum*, general in East, race 73, race 1153, ND; *C. truncatum*, PA to AL, IA, TX.

BACTERIAL Blight. *Xanthomonas phaseoli*, general in East, rare Pacific Coast.

BACTERIAL Halo Blight; Grease Spot. *Pseudomonas syringae* pv. *phaseolicola*, general in East, rare on Pacific Coast.

BACTERIAL Northern Wilt. *Clavibacter flaccumfaciens*, Northeast.

BACTERIAL Pink Seed. *Erwinia rhapontici*, Alberta, Canada.

BACTERIAL Soft Rot. *Erwinia carotovora*, cosmopolitan in market.

BACTERIAL Southern Wilt; Brown Rot. *Pseudomonas solanacearum*, AL, FL, GA, OK.

BACTERIAL Spot, Leaf and Pod. *Pseudomonas syringae*, widespread.

BACTERIAL Stem Rot. *Pseudomonas adzukicola*, MN.

BACTERIAL "Stickiness". *Pseudomonas coadunata*, CA; *P. ovata*, VA.

BACTERIAL "Wildfire". *Pseudomonas syringae* pv. *tabaci*, MA, NC.

BACTERIAL Wilt. *Curtobacterium flaccumfaciens* subsp. *flaccumfaciens*, ND; Alberta, Canada, NE.

BLIGHT, Ashy Stem; Charcoal Rot. *Macrophomina phaseoli*, MD to GA, CA, CO.

BLIGHT, Gray Mold. *Botrytis cinerea*, occasional.



- BLIGHT, Phytophthora. **Phytophthora capsici**, CT, IL, NY; **Choanephora cucurbitarum**, FL.
- BLIGHT, Pod. **Diaporthe phaseolorum**, CT to FL, LA, OH, OK, on limabean.
- BLIGHT, Southern. **Sclerotium rolfsii**, VA to FL, AR, CA, TX.
- DAMPING-OFF. **Pythium ultimum**; **P. debaryanum**; **Rhizoctonia solani**.
- DOWNY MILDEW. **Phytophthora phaseoli**, on lima bean, East, central states; **P. capsici**, DE, MD, NJ, VA.
- LEAF AND POD SPOT. **Ascochyta boltshauseri**, NC, OR, PA; **A. phaseolorum**, WA; **Bipolaris sorokinaria**, WI.
- LEAF AND STEM DISEASE. **Cercospora zebrina** (clover isolate), NC.
- LEAF SPOT. **Alternaria** spp.; **Aristastoma oeconomicum**, GA, VA; **Cercospora canescens**, southeastern states to NY; **Epicoccum** sp., secondary on lima bean; **Isariopsis griseola**, Angular Leaf Spot, ME to FL, OK, TX; **I. laxa**, IN, NJ; **Mycosphaerella cruenta**, NJ to FL, AR, TX, WI; **Phyllosticta phaseolina**, NY to FL, IN, TX; **Stemphylium botryosum**; **Stagonospora phaseoli**, TN.
- LEAF SPOT, White. **Pseudocercospora albida**, MN.
- LEAF SPOT, Zonate. **Cristulariella pyramidalis**, WV.
- NEMATODE, Awl. **Dolichodorus heterocephalus**.
- NEMATODE, Hop Cyst. **Heterodera humuli**, OR; **H. glycines**, soybean cyst, IL.
- NEMATODE, Root Knot. **Meloidogyne arenaria**; **M. hapla**; **M. incognita**; **M. javanica**; Root Lesion, **Pratylenchus pratensis**.
- NEMATODE, Stubby Root. **Trichodorus christiei**.
- NEMATODE, Stunt. **Tylenchorhynchus claytoni**.
- NONPARASITIC. **Baldhead**. Mechanical injury to seed growing point.
- Blossom Drop**. High temperature, low humidity.
- Bronze Leaf**. Excessive salt concentration, CO, MT, WY.
- Chlorosis**. Deficiency of: Copper, FL; Magnesium, FL, MA, SC, VA; Manganese, FL; Zinc, CA, FL. Soil alkalinity, West.
- Ozone Injury**. Air pollution.
- Seed Pitting**. Plant bug injury.
- Variation**. Genetic leaf abnormality.
- Wind Whip**.
- POD SPOT, Seed Mold. **Cladosporium herbarum**, on lima bean, CA, FL.
- POD SPOT, Yeast Spot. **Nematospora phaseoli**, on lima bean; **Pullularia pullulans**, NY.
- POWDERY MILDEW. **Erysiphe polygoni**, East, South, CA; **Microsphaera diffusa**, GA, IL, MD; **M. euphorbiae**, IL.
- ROT, Black Root. **Thielaviopsis basicola**, AL, CA, NH, NJ, NY.
- ROT, Brown Stem. **Cephalosporium gregatum**, IL.
- ROT, Root. **Fusarium solani** f. sp. **phaseoli**, general; **F. acuminatum**, **F. reddens**, MN, ND; **Phoma terrestris**, secondary, CA; **Phymatotrichum omnivorum**, AZ, OK; **Pythium aristorum**, WI; **P. catenulatum**, WI; **P. dissotocum**, WI; **Pythium** spp., widespread; **Aphanomyces eutiches**, NY.
- ROT, Root and Stem; Web Blight. **Pellicularia filamentosa**, general.
- ROT, Soft. **Rhizopus stolonifer** and **Pythium aphanidermatum**, leak, of market beans.
- ROT, Stem; Wilt. **Sclerotinia sclerotiorum**, general, especially in South and West; **S. minor**; **S. ricini**; **S. intermedia**, in market beans. **Pythium myriotylum**, FL, GA, SC; **Marasmius** spp., NE.
- RUSSET. **Plectosporium tabacinum**, MD, NY.
- RUST. **Uromyces phaseoli** var. **typica**, II, III, general; 0, I, rare; **U. appendiculatus** var. **appendiculatus** (= **U. phaseoli**), CO, NE; **Phakopsora pachyrhizi**, FL.
- STEM NECROSIS, Decline. **Phytophthora capsici**, MI.
- SPOT ANTHRACNOSE; Lima Bean Scab. **Sphaceloma phaseoli**, NC.
- VIRUS. **Alfalfa Mosaic**, WA; **Bean Common Mosaic**, ID, NY, WA; **Bean Common Mosaic Necrosis**, CA; **Bean Mosaic**, general; **Southern Bean Mosaic**, CA, CO, LA, MD, MI; **Bean Pod Mottle**; **Bean Phyllody**; **Bean Red Node**; CO, ID, MS, WY; **Bean Yellow Mosaic**, ND; **Bean Yellow Stipple**, IL; **Bean Yellow Dot** = **Alfalfa Mosaic**, WA; **Beet Curly Top**, West; **Cucumber Mosaic**; **Tobacco Necrosis**; **Tobacco Ring Spot**;

**Bean Golden Mosaic**, FL; **Cowpea Chlorotic Mottle**, IL; **Clover Proliferation Subgroup A Phytoplasma**, WA; **Bromegrass Mosaic**, general, IA, SD, on Broad Bean (*Vicia fava* var. *minor*); **Clover Yellow Vein**, CA; **Cucurbit Yellow Stunting Disorder**, CA; **Lettuce Mosaic**, NY; **Lima Bean Mild Mottle**, GA; **Potato Virus X**, work at the University of Wisconsin on *P. lathyroides*, *P. lunatus*, *P. aboriginens*, *P. vulgaris* "Pinto"; **Peanut Stunt**, AR; **Peanut Mottle**, WA; **Cucurbit Leaf Crumple**, FL; **Sida Golden Mosaic**, FL; **Sida Micrantha Mosaic**, Brazil.

WILT; Yellows. **Fusarium oxysporum** f. sp. **phaseoli**, CA, CO, ID, MT; **F. oxysporum** f. sp. **vasinfectum**, AL, FL.

Anthrachnose and bacterial blight, often erroneously called "rust," are common and destructive bean diseases best avoided by purchasing healthy seed grown in disease-free arid sections of California and the Northwest. True rust is prevalent in the Southwest and sometimes in the East on susceptible Kentucky Wonder pole beans. Use resistant varieties; clean and disinfest poles each season.

Downy mildew is common on lima beans in moist summers. Resistant varieties are the best solution to virus problems. Avoid picking or cultivating beans when foliage is wet.

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### **Bean, Mung (*Vigna radiata*)**

DAMPING-OFF. **Rhizoctonia solani**, CA.  
ROT, Sprout. **Cylindrocephalum** sp., WA.

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### **Bean, Scarlet Runner (*Phaseolus coccineus*)**

ANTHRACNOSE. **Colletotrichum lindemuthianum**, NY.  
BACTERIAL Blight. **Xanthomonas phaseoli**, IN, NJ, TX.

BACTERIAL Halo Spot. **Pseudomonas phaseolicola**, NY.

LEAF SPOT. **Ascochyta boltshauseri**, OR;  
**Cercospora cruenta**, AL.

POWDERY MILDEW. **Erysiphe polygoni**, CA.

ROT, Root. **Fusarium solani** f. sp. **phaseoli**, NY.

RUST. **Uromyces phaseoli** (II, III), AL, MA, NH;  
**Phakopsora pachyrhizi**, FL.

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### **Bean, Tepary (*Phaseolas acutifolius*)**

BLIGHT, Southern. **Sclerotium rolfsii**, AL.

POWDERY MILDEW. **Erysiphe polygoni**, CA.

ROT, Root. **Fusarium solani**, CA;  
**Phymatotrichum omnivorum**, TX.

RUST. **Uromyces phaseoli** (II, III), CA, TX.

VIRUS. **Beet Curly Top**, CA.

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### **Bean, Urd (*Vigna*)**

BACTERIAL Leaf Spot; Stem Collapse. **Pseudomonas syringae** pv. **syringae**, ID.

VIRUS. **Cowpea Mosaic**, NY.

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### **Bean, Winged (*Psophocarpus tetragonolobus*)**

VIRUS. **Cucumber Mosaic**, FL; **Clover Yellow Vein**, MD.

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### **Bearberry (*Arctostaphylos uva-ursi*)**

BLACK MILDEW. **Asterina gaultheriae**, WI;  
**A. conglobata**, ME.

GALL, Leaf; Red Leaf Spot. **Exobasidium vaccinii**, CO, ID, MA, MT, NJ, NY, VT, WI.

LEAF SPOT. **Cercospora gaultheriae**, WI.

RUST. **Chrysoomyxa arctostaphyli** (III), AK, CO, MT, UT, WI; **Puccinia sparsum** (II, III), WI.

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### **Beauty-Bush (*Kolkwitzia*)**

LEAF SPOT. **Cercospora kolkwitziae**, AL, OK.

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**Beech (*Fagus*)**

BROOMRAPE. *Conophilis americana*; *Epifagus virginiana*, beechdrops.

CANKER, Beech Bark Disease. *Nectria coccinea* var. **faginata**, associated with woolly beech scale, destructive northern New England and NY, OH; *N. galligena*, New England, MI, NY, NC, PA, WV; *Cryptococcus fagesuiga*, OH, VA.

CANKER, Bleeding. *Phytophthora cactorum*. MA, NY, RI.

CANKER; DIEBACK. *Cytospora* spp.; *Strumella coryneoides*, New England; *Phomopsis* sp., MI, NY, PA.

CANKER, Felt Fungus. *Septobasidium* spp.; *S. cokeri*, *S. curtisii*, FL, NC.

CANKER, Perennial. *Endothia gyrosa*, NY.

LEAF SPOT. *Cercospora* sp., NY; *Gloeosporium fagi*, CT to WI; *Microstroma* sp., IL, NJ; *Phyllosticta faginea*, MA to WV.

MISTLETOE. *Phoradendron serotinum* (**flavescens**), occasional VT to IN and southward.

NONPARASITIC. **Leaf Scorch**, common in Northeast but cause unknown, associated with high temperature and water deficiency.

**Leaf Mottle**, cause unknown, virus suspected, CT, NJ, NY, PA.

POWDERY MILDEW. *Microsphaera alni*, MA to AL, WI; *Phyllactinia corylea*, New England to AL, IL, WI.

ROT, Heart, Butt, Wound. *Fomes* spp.; *Ganoderma applanatum*; *Poly-porus* spp.; *Schizophyllum commune*; *Stereum* spp.

ROT, Mushroom Root. *Armillaria mellea*, CT, NJ, NY, OH.

ROT, Sapwood. *Hericium* spp.; *Ustulina deusta*.

ROT, Wood. *Daedalea* spp.; *Daldinia* spp.; *Lenzites betulina*, widespread.

SOOTY MOLD. *Scorias spongospora*, MA to AL, MO.

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**Beet (*Beta vulgaris*)**

BACTERIAL, symptomless. *Clavibacter sepedonicum*, ND.

BACTERIAL Black Streak. *Pseudomonas syringae* pv. **aptata**, CA, OR, UT, WA.

BACTERIAL Crown Gall. *Agrobacterium tumefaciens*, occasional.

BLIGHT, Foliage. *Thanatephorus cucumeris*, MN.

BLIGHT, Phytophthora. *Phytophthora*, IL.

BLIGHT, Southern. *Sclerotium rolfsii*, NC to FL, AZ, CA, TX.

DAMPING-OFF. *Pythium* spp.; *Rhizoctonia solani*, general.

DODDER. *Cuscuta* spp., occasional when beets follow legumes.

DOWNY MILDEW. *Peronospora schachtii*, CA, MN, NJ, NY, OR, WA.

LEAF SPOT. *Alternaria* sp., general, secondary; *Gloeosporium betae*, MS, MT; *Ramularia beticola*, CA, OR, WA; *Septoria betae*, DE, IN, MA, OH.

LEAF SPOT; Blight. *Cercospora beticola*, general. NEMATODE, Leaf and Stem. *Ditylenchus dipsaci*, KS.

NEMATODE, Root Knot. *Meloidogyne arenaria*; *M. javanica*; *M. chitwoodi*, Pacific NW; *M. hapla*, Pacific NW; Sugar-beet, *Heterodera schachtii*; Clover Cyst, *H. trifolii*; Gall, *Nacobbis Batatiformis*.

NEMATODE, Sheath. *Hemicycliophora obtusa*. Sting, *Belonolaimus gracilis*; Stubby Root, *Trichodorus christiei*; Lesion, *Pratylenchus penetrans*.

NONPARASITIC. **Black Heart**. Boron deficiency, general; phosphorus deficiency, occasional.

**Bronzing**. Potassium deficiency occasional.

**Chlorosis**. Alkalinity, iron, manganese deficiency.

**Girdle**. Strangling constriction of tap root.

**Tipburn**. Black tips, from high nitrogen with low light intensity.

POWDERY MILDEW. *Erysiphe polygoni*, CA, MI.

ROT, Black Heart. *Phoma betae*, general, occasional as leaf spot.

ROT, Black Root. *Aphanomyces cochlioides*, general.

ROT, Charcoal. *Macrophomina phaseoli*, CA.

ROT, Crown. *Sclerotinia sclerotiorum*, CT, IL.

ROT, Root. *Phytophthora drechsleri*, CA, CO, ID; *P. cryptogea*, WY; *Phyalospora*

**rhodina**, AL; **Phymatotrichum omnivorum**, TX; **Pythium deliense**, AZ, TX; **Rhizopus arrhizus**, WY; **Fusarium oxysporum** f. sp. **betae**, CO, MT.

ROT, Violet Root. **Helicobasidium purpureum**, occasional.

ROT, Wound, Storage. **Aspergillus fumigatus**, MI; **Rhizopus** spp., cosmopolitan; **Cylindrocarpon radicola**, NY; **Penicillium** spp.; **Fusarium** spp.

RUST. **Puccinia aristidae** (0, I), CO, KS, NM, UT; II, III on grasses; **P. subnitens**, NE; **Uromyces betae** (II, III), AZ, CA, NM, OR.

SCAB. **Streptomyces scabies**, widespread.

SCAB, Acid. **Streptomyces acidiscabies**, ME.

VIRUS. **Beet Black Scorch**, CO; **Beet Curly Top**; **Beet Latent**; **Beet Mosaic**; **Beet Pseudo-Yellows**; **Beet Ring Mottle**; **Beet Savoy**; **Beet Yellow Net**; **Beet Yellows**; **Beet Yellow Vein**; **Cucumber Mosaic**; **Beet Necrotic Yellow Vein**, CA, NE, TX, WA; **Beet Necrotic Yellow Vein** (Vector, *Polymyxa beta*, **Rhizomania** disease), CA, MN, TX, WA; **Beet Western Yellows**, CA; **Lettuce chlorosis**, CA; **Lettuce Infectious Yellows**, AZ, CA; **Beet Distortion Mosaic**, CA; **Beet 2 Alphacryptovirus**; **Lettuce Speckles Mottle**, CA; **Beet Soilborne**; **Beet Soilborne Mosaic**, MN; **Curtoviruses**, AZ.

WHITE RUST. **Albugo bliti**, IA, OH.

WILT. **Verticillium albo-atrum**, CO.

WILT; Yellows. **Fusarium** sp., MN; **Fusarium conglutinans** (F. **orthoceras**) var. **betae**; **F. graminearum** (sugar beets) MN, WY.

Most of the troubles are more important for commercially grown sugar beets. *Cercospora* leaf spot or blight is common on garden beets although spraying is not often practical. Boron deficiency can be prevented by treating soil with borax.

### Beggarweed, Florida (*Desmodium tortuosum*)

RUST. **Phakopsora pachyrhizi**, GA.

VIRUS. **Tomato Spotted Wilt**, GA.

### Begonia

BACTERIAL Crown Gall. **Agrobacterium tumefaciens**, CT, MS, TX.

BACTERIAL Spot. **Xanthomonas begoniae**, general.

BLIGHT, Gray Mold. **Botrytis cinerea**, cosmopolitan.

LEAF SPOT, Anthracnose. **Gloeosporium** sp., FL, LA, MA, MS, NJ, TX; **Cercospora** sp., FL, GA, MS, NJ, TX; **Penicillium bacillosporium**, secondary; **Phyllosticta** sp., NJ, PA.

NEMATODE, Leaf. **Aphelenchoides fragariae**, cosmopolitan in greenhouses; Lesion, **Pratylenchus** sp.

NEMATODE, Root Knot. **Meloidogyne** spp., cosmopolitan in gardens in the South, greenhouses in the North.

NONPARASITIC. **Oedema**. A water-soaked spotting, frequent in house plants.

POWDERY MILDEW. **Golovinomyces cichoracearum**, CA; **Oidium** sp., CA, FL, NC; **Oidium begoniae**, OH.

ROT, Root. **Armillaria mellea**, CA; **Thielaviopsis basicola**, MA, OH.

ROT, Root and Stem. **Pythium** spp., CA, MO; **Rhizoctonia solani**, cosmopolitan; **Sclerotinia sclerotiorum**, CA; **Sclerotium rolfsii**, IL.

VIRUS. **Impatiens Necrotic Spot**, NC; **Tomato Spotted Wilt**, CA, MO, OK, TX; **Broad Bean Wilt**, MN.

WILT. **Verticillium albo-atrum**, CT, NY; **Fusarium foetens**, CT, Ontario Canada.

The dry air of the average living room keeps leaf diseases at a minimum. Overwatering may foster root rots and physiological oedema. In greenhouses *Botrytis* blight, bacterial spot, leaf nematode, and *Pythium* rots may become problems. Powdery mildew is serious on tuberous begonias.

### Bells-of-Ireland (*Molucella*)

LEAF SPOT. **Cercospora apii**, CA, Texcoco, Mexico.

ROT, Crown. **Myrothecium** sp., TX.

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## Bidens (*Bur-Marigold*)

BACTERIAL, MLO. *Aster Yellows*, CA.

POWDERY MILDEW. *Sphaerotheca macularis*, general.

RUST. *Uromyces bidenticola* (0, I, II, III), CA, FL, NM.

VIRUS. *Bidens Mottle*, FL.

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## Bignonia (*Crossvine*)

BLACK MILDEW. *Asterina bignoniae*, LA; *Meliola bidentata*, Gulf states; *M. furcata*, FL.

LEAF SPOT. *Cercospora capreolata*, AL, MS; *Leptostromella bignoniae*, TN.

NEMATODE, Root Knot. *Meloidogyne* sp.

SOOTY MOLD. *Capnodium elongatum*, AL, MS.

SPOT ANTHRACNOSE. *Sphaceloma* sp., LA.

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## Bindweed, Field (*Convolvulus*)

POWDERY MILDEW. *Erysiphe convolvuli* var. *convolvuli*, General, N. America.

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## Birch (*Betula*)

ANTHRACNOSE. *Gloeosporium* sp.; *Glomerella cingulata*, VA, on Eur. White Birch.

CANKER, Bark Patch. *Aleurodiscus oakesii*, VT; *Solenia ochracea*, cosmopolitan.

CANKER, Bleeding, *Phytophthora cactorum*, NJ.

CANKER, Trunk. *Hymenochaete agglutinans*, MI, PA; *Nectria coccinea*; *N. galligena*; *Twig Canker*, *N. cinnabarina*.

DIEBACK. *Melanconis stilbostoma*, MA to IN on white birch; other species; *Cylindrosporium orthosporum*.

LEAF BLISTER. *Taphrina americana*, Witches' Broom, NH, VT, WI; *T. carnea*, ME, NH; *T. flava*, ME, MA, NH, WI.

LEAF SPOT. *Gloeosporium betularum*; *G. betulaeluteae*, NY, PA; *Cylindrosporium*

*betulae* DE, NY, WI; *Phyllosticta betulinum*; *Septoria betulicola*; *S. betulae*.

MISTLETOE. *Phoradendron serotinum* (*flavescens*), FL, IN, TX; *Viscum album*, CA, on *Betula verrucosa* (Weeping White Birch).

POWDERY MILDEW. *Microsphaera alni*, MA, NH, PA; *Phyllactinia corylea*, widespread.

ROT, Heart. *Fomes* spp.; *Stereum purpureum*; *Polyporus hispidus*.

ROT, Root. *Armillaria mellea*; *Phytophthora cinnamomi*, of seedlings; *Phymatotrichum omnivorum*, TX.

ROT, Sapwood. *Polyporus betulinus*, general on gray and paper birches; *P. gilvus*; *Steccherinum* spp.

ROT, Wood. *Polyporus* spp., *Stereum* spp.; *Daedalea unicolor* and other spp.

ROT, Wound. *Schizophyllum commune*; *Pleurotus serotinus*.

RUST. *Melampsoridium betulinum* (II, III); 0, I on larch.

VIRUS. Dieback, vein clearing, New England.

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## Bird-of-Paradise (*Strelitzia*)

BACTERIAL Leaf Spot; Blight. *Xanthomonas campestris*, FL.

BACTERIAL Leaf Stripe. *Acidovorax avenae* subsp. *avenae*, FL.

BLIGHT. *Cylindrocladium clavatum*, FL.

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## Bischofia

LEAF SPOT, Algal. *Cephaleuros virescens*, FL.

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## Bishops-Cap (*Mitella*)

LEAF SPOT. *Cercospora mitellae*, MI; *Phyllosticta mitellae*, NY, WI; *Ramularia mitellae*, IL, IN, MI, NY; *Septoria mitellae*, MI, WI.

POWDERY MILDEW. *Sphaerotheca macularis*, WI. ROT, Leaf. *Sclerotium deciduum*, WI.

RUST. *Puccinia heucherae* (III), widespread.

**Bittercress (*Cardamine*)**

ROT. *Sclerotinia minor*, NC.

**Bittersweet (*Celastrus*)**

BACTERIAL Crown Gall. *Agrobacterium tumefaciens*, CT.

CANKER; DIEBACK. *Glomerella cingulata*, NH, NC.

LEAF SPOT. *Ascochyta* sp., CT; *Asteria celastris*, KS, ME, MI; *Cercospora melanochaeta*, IA, KS, NE, ND; *Marssonina* sp., NY; *Phyllosticta celastris*, IL, KS, MA, NY, WV; *Ramularia celastris*, VT to MS, ND, TX.

POWDERY MILDEW. *Microsphaera alni*, WI; *Phyllactinia corylea*, ME to VA, SD, TX.

ROT, Root. *Phymatotrichum omnivorum*, TX.

**Bixa (*Annato-Tree*)**

LEAF SPOT. *Cercospora bixae*; *Phyllosticta bixae*.

LEAF SPOT, Algal. *Cephaleuros virescens*, FL.

**Black Bearberry (*Arctous*)**

RUST. *Pucciniastrum sparsum* (II, III), AK.

**Blackberry (*Rubus*)**

ANTHRACNOSE. *Glomerella cingulata*, Mexico.

BACTERIAL Crown Gall. *Agrobacterium tumefaciens*, general; Cane Gall, *A. rubi*, NY, OR, PA, WA, WI; Hairy Root, *A. rhizogenes*, OR.

BLIGHT, Cane. *Gnomonia rubi*, ME, MD, NY, PA, VT; *Leptosphaeria coniothyrium*, NY to NC, TX, WI, Pacific Northwest.

BLIGHT, Leaf. *Colletotrichum acutatum*, Brazil.

BLIGHT, Spur. *Didymella applanata*, VA, WI.

BLIGHT, Stamen; Dry Berry. *Hapalosphaeria deformans*, OR, WA.

BLIGHT, Thread. *Pellicularia koleroga*, LA.

BLOTCH, Sooty. *Gloeodes pomigena*, MD to NC, IN, TX; *Geastrum polystigmatis*, NC.

CANKER. *Glomerella cingulata*, MD, VA; *Phomopsis* sp., WA; *Botryosphaeria obtusa*, OH; *B. dothidea*, MD; *Leptosphaeria coniothyrium*, OH; *Gnomonia rubi*, OH.

CANKER, Cane Spot. *Ascospora ruborum*, WA.

DOWNY MILDEW. *Peronospora rubi*, MD, WI; *P. sparsa*, Mexico.

FRUIT SPOT; Flyspeck. *Leptothyrium pomi*, PA to NC, IL.

LEAF SPOT. *Mycosphaerella confusa*, VA to FL, IL, IN, TX; *M. rubi*, NC, WI; *Pezizella oenotherae*, also fruit rot, MD, OH, VA; *Cylindrosporium rubi*, NC, TX; *Phyllosticta* spp., FL, IL, NH; *Septoria darrowi*; *S. rubi*, general.

LEAF SPOT, Algal. *Cephaleuros virescens*, AR, FL, LA.

POWDERY MILDEW. *Sphaerotheca macularis*, CT to MD, IL, MN, Pacific Northwest; *Phyllactinia corylea*, MI.

ROSETTE, Double Blossom. *Cercospora rubi*, NY to FL, CA, TX.

ROT. *Botrytis* spp., SC.

ROT, Gray Mold. *Botrytis cinerea*, general on fruit, bud, shoot.

ROT, Root. *Armillaria mellea*, TX, WA; *Phymatotrichum omnivorum*, TX; *Phytophthora dreschleri*, NC; *Rhizoctonia solani*.

ROT, White Root. *Corticium galactinum*, near apple trees, AR, MD, VA.

RUST. *Phragmidium violaceum*, CA.

RUST, Orange. *Gymnoconia peckiana* (0, I, III), ME to GA and west to Pacific; *Kunkelia nitens* (I), general, more common in South; *Phragmidium violaceum*.

RUST, Yellow Cane. *Kuehneola uredinis* (0, I, II, III), ME to FL, LA, WI.

SPOT ANTHRACNOSE. *Elsinoë veneta*, general.

VIRUS. **Blackberry Dwarfing**; **Blackberry Mosaic**; **Blackberry Variegation**; **Loganberry Dwarf**, OR; **Raspberry Beta-Leaf Curl**; **Red Raspberry Mosaic**, MA to VA, IA, WI, Pacific Northwest; **Raspberry Ringspot**; **Raspberry Streak**, OH, PA, WA;

**Tobacco Streak**, OR, WA; **Wineberry Latent**; **Beet Pseudo-Yellows**, AR, NC, SC; **Marafivirus**, MS; **Impatiens Necrotic Spot**, Southern U.S., AL; **Tobacco Ringspot**, **Tomato Ringspot**, **Raspberry Bushy Dwarf**, AL; **Black Raspberry Necrosis**, TN; **Blackberry Chlorotic Ringspot**, OR, WA.

WILT. **Verticillium albo-atrum**, CA, MN, NY, WA.

Sanitation is the best approach to home garden blackberry diseases. Plants with crown gall, orange rust, or virus diseases should be removed and burned, replanting with clean stock.

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### **Blackberry-Lily (*Belamcanda*)**

LEAF SPOT. **Alternaria** sp., KS, VA; **Didymellina macrospora**, CA, IA, KS, NY OK, VT, VA.

RUST. **Puccinia iridis**, FL.

VIRUS. **Tomato Spotted Wilt**, FL.

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### **Bladder-Senna (*Colutea*)**

BLIGHT, Twig. **Diplodia coluteae**, PA.

POWDERY MILDEW. **Erysiphe polygoni**.

ROT, Root. **Ganoderma** sp., OK; **Phytophthora cactorum**, MO.

RUST. **Uromyces colutea** (II, III), KS.

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### **Blanket Flower (*Gaillardia grandiflora*)**

POWDERY MILDEW. **Leveillula taurica**, WA.

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### **Bleeding-Heart (*Dicentra spectabilis*)**

ROT, Stem. **Sclerotium rolfisii**, NY; **Sclerotinia sclerotiorum**, MN.

VIRUS. **Tobacco Rattle**, MA, MI, MN.

WILT. **Fusarium** sp., NJ.

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### **Bleeding-Heart Vine (*Clerodendrin*)**

VIRUS. **Zonate Ring Spot**, FL.

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### **Blephilia (Wood Mint, Downy Pagoda Plant)**

LEAF SPOT. **Cercoseptoria blephiliae**, WI; **Septoria menthicola**, WI.

RUST. **Puccinia menthae** (0, I, II, III), IL, IN, IA, MD, MI, MO, TN, WI.

VIRUS, Mottling. **Cucumber Mosaic**, AR.

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### **Bloodroot (*Sanguinaria*)**

BLIGHT, Gray Mold. **Botrytis cinerea**, NY.

LEAF SPOT. **Cercospora sanguinariae**, MD, MO, NY, PA, TX, WI; **Cylindrosporium circinans**, MD, MO, WI; **Gloeosporium sanguinariae**, OH, TX; **Phyllosticta sanguinariae**, MO, TX, WV.

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### **Blueberry (*Vaccinium*)**

ANTHRACNOSE. **Gloeosporium** sp., FL, NJ.

BACTERIAL Canker. **Pseudomonas** sp., OR; **Xanthomonas campestris** pv. **maniotis** (also leaf spot), FL; **X. campestris** pv. **fici** (also leaf spot), FL.

BACTERIAL Crown Gall. **Agrobacterium tumefaciens**, MA, MI, WA.

BACTERIAL Leaf Scorch. **Xylella fastidiosa**, FL.

BLACK MILDEW, **Meliola nidulans**, AL, GA.

BLIGHT, Blossom, Fruit, Twig. **Botrytis cinerea**, CA, ME, MA, NJ, OR, WA; **Diaporthe vaccinii**, ME, MA, NJ.

BLIGHT, Stem. **Botryosphaeria dothidea** (*B. ribis*), NC; **Phomopsis vaccinii**, NC; **Lasiodiplodia theobromae**, FL; **Fusarium** sp., Argentina; **Calonectria colhounii**, MI.

BLIGHT, Twig. **Nigrospora sphaerica**, Argentina.

CANKER, Blight of Stem, MI. **Glomerella cingulata**, **Alternaria** sp., **Sordaria** sp., **Epicoccum** sp., **Tympanis** sp., **Papulospora** sp., **Nectria cinnabarina**, **Coniothyrium** sp., **Pestalotia** sp., **Verticillium** sp., **Godronia cassandrae** f. sp. **vaccinii**, **Phoma** sp., **Dendrophoma** sp., **Diaporthe** (**Phomopsis**) **vaccinii**, **Melanospora** sp., **Pullularia** spp., **Coryneum**

- microstictum**, *Sphaeronema* sp., *Fusarium* spp., *Bispora* sp., *Botrytis cinerea*, *Cephalosporium* sp., *Cylindrocarpon* sp., *Pyrenochaeta* sp.
- CANKER, Cane. *Physalospora corticis*, AL, FL, MS, NC; *Godronia cassandrae*, ME, MI; *Botryosphaeria corticis*, AL, FL, GA, MS, NC; *Coryneum microstictum*, MA, MI.
- CANKER, Twig. *Dothidella vacciniicola*, NC; *Fusicoccum putrefaciens*, ME, MA, MI, *Phomopsis vaccinii*, MI; *Sporocadus lichenicola*, OR.
- DODDER. *Cuscuta* sp., FL.
- GALL, Crown and Root. *Agrobacterium rubi* and *A. rhizogenes*, Argentina.
- GALL, Red Leaf. *Exobasidium vaccinii*, also fruit green spot, general; *Synchytrium vaccinii*, ME, MS.
- LEAF RUST. *Thekopsora minima*, MI, Mexico; *Pucciniastrum corymbosum*, HI.
- LEAF SPOT. *Gloeocereocospora inconspicua*, GA, MD, NC; *Phyllosticta* sp., AL, GA; *Phyllostictina vaccinii*, GA, MD, MI, NC; *Piggotia vaccinii*, WI; *Discohainesia oenotherae*, NJ, NC; *Ramularia vaccinii*, FL, MD, MI, NJ, NY; *Septoria albopunctata*; *Alternaria tenuissima*, NC; *Cristulariella pyramudates*, MD; *Nigrospora sphaerica*, Argentina.
- LEAF SPOT, Double Spot. *Dothichiza caroliniana*, GA, NC.
- LEAF SPOT, Tar. *Thytsima vaccinii*, widespread.
- NEMATODE. *Helicotylenchus* sp.; *Hemicycliophora similis*; *Merlinius joctus*; *Xiphinema Americanum*; *Paratrichodorus renifer*, WA, British Columbia, Canada.
- POWDERY MILDEW. *Microsphaera alni* var. *vaccinii*, widespread.
- ROT, Berry; Dieback. *Alternaria* sp., MA, NJ, NC; *Glomerella cingulata*, NJ, NY; *Phomopsis vaccinii*, NC.
- ROT, Brown; Mummy Berry. *Monilinia vaccinii-corymbosi*, IN, ME, MA, MI, NJ, NY, NC, PA; *Sclerotinia sclerotiorum*, Argentina.
- ROT, Root. *Phytophthora cinnamomi*, AR, NJ, VA; *P. nicotinae*, VA; *P. palmivora*, VA; *Fusarium proliferatum*, Argentina.
- RUST, Witches' Broom. *Pucciniastrum goeppertianum* (III) ME to MN; 0, I on fir; Leaf, *P. myrtilli* (II, III) ME to PA, WI; 0, I, spruce.
- VIRUS. **Blueberry Necrotic Ring Spot; Blueberry Red Ring Spot; Blueberry Stunt**, MA, MI, NJ, NY, NC; **Blueberry Shoestring**, MI, NJ, WA; **Blueberry Leaf Mottle**, MI; **Blueberry Necrotic Shock**, OR, WA; **Blueberry Scorch**, CT, MA, OR, WA, British Columbia, Canada; **Tobacco Ring Spot**, IL; **Peach Rosette Mosaic**, MI.
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- Blue Cohosh (*Caulophyllum*)**
- BLIGHT, Leaf. *Botrytis streptothrix*, NJ, NY.
- LEAF SPOT. *Cercospora caulophylli*, VT to VA, MO, WI.
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- Blue Curls (*Trichostema*)**
- LEAF SPOT. *Septoria trichostematis*, NY.
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- Blue-Eyed Grass (*Sisyrinchium*)**
- BLIGHT, Leaf. *Kellermania sisyrinchii*, CA, NM, ND.
- NEMATODE, Lesion. *Pratylenchus pratensis*.
- RUST. *Uromyces houstoniatus* (II, III), ME, WV; 0, I on *Houstonia* spp.; *U. Probus* (I, II, III), ID, OR, TX, UT, WA; *Aecidium residuum* (0, I), OK, TX.
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- Blue Lace-Flower (*Trachymene*)**
- BACTERIAL, MLO. **Western Aster Yellows**, CA.
- NEMATODE, Root Knot. *Meloidogyne* sp., FL.
- ROT, Root and Stem. *Fusarium* sp., CT, NJ; *Rhizoctonia solani*, NJ.
- WILT. *Phytophthora cactorum*, MA.



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**Bluestem, Big (*Andropogon*)**

LEAF SPOT. *Ascochyta brachypodii*, NY, PA;  
*Phyllosticta andropogonivora*, MN, ND, SD.  
 VIRUS. Barley Yellow Dwarf.

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**Bluestem, Little (*Schizachyrium*)**

VIRUS. Barley Yellow Dwarf.

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**Boehmeria**

NEMATODE. *Paratylenchus elachistus*, FL.

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**Boisduvalia**

RUST. *Puccinia glabella* (II, III), NV, OR, UT;  
 0, I unknown; *P. oenotherae* (0, I, II, III), CA,  
 ID, NV, OR, WA; *P. vagans* var.  
*epilobi-tetragoni* (0, I, II, III), CA, ID, NV,  
 OR, UT.

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**Boltonia**

LEAF SPOT. *Septoria erigerontis* var. *boltoniae*,  
 IA, WI.

POWDERY MILDEW. *Golovinomyces*  
*cichoracearum*, SD.

RUST. *Puccinia dioicae* var. *asteris* (II, III), IA,  
 NE, ND, SD; 0, I on sedge; *Uromyces*  
*compactus* (0, I, II, III), TX.

SMUT, White. *Entyloma compositarum*, WI.

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**Borage (*Borago*)**

LEAF SPOT. *Ramularia* sp., CA; *Stemphylium* sp.  
 ROT, SOFT. *Sclerotinia sclerotiorum*, ND.

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**Bottle-Brush (*Callistemon*)**

LEAF SPOT. *Cylindrocladium colhounii*, FL, HI,  
 LA, NC, OR, SC; *C. clavatum*, FL.  
 ROT, Root. *Armillaria mellea*, CA.

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**Bougainvillea (*Buginvillea*)**

BACTERIAL Leaf Spot. *Pseudomonas*  
*andropogonis*, FL; *Burkholderia*  
*andropogonis*, Canada.

BLIGHT, Foliage. *Phytophthora parasitica*, FL.

LEAF SPOT. *Cladosporium arthrinioides*, TX;  
*Cercospora bougainvilleae*, FL; *Passalora*  
*bougainvilleae*, Mexico.

VIRUS. Mosaic. Undetermined, FL.

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**Bouvardia**

NEMATODE, Leaf. *Aphelenchoides fragariae*.

NEMATODE, Root Knot. *Meloidogyne* sp., NY.

RUST. *Puccinia bouvardiae* (0, I, III), AZ.

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**Boysenberry**

Subject to most blackberry diseases: anthracnose, crown gall, cane gall, cane canker, dieback, leaf spots, mosaic.

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**Boxelder (*Acer negundo*)**

ANTHRACNOSE. *Gloeosporium apocryptum*,  
 widespread.

BACTERIAL Leaf Spot. *Pseudomonas aceris*, CA.

BLIGHT Leaf. *Coryneum negundinis*, MO; on  
 twigs, ME.

BLIGHT, Twig. *Coniothyrium negundinis*, IL,  
 OK; *Coryneum negundinis*, ME. *Nectria*  
*cinnabarina*.

CANKER, Felt Fungus. **Septobasidium** spp., NC.  
 LEAF SPOT. **Alternaria** sp.; **Ascochyta negundinis**, IL, NC; **Cercosporanegundinis**, KS, NE, WI; **Piggotia negundinis**, WI; **Phyllosticta minima**, general; **P. negundinis**, ME to AL, TX, WI; **Septoria aceris**, general; **S. negundinis**; **Cylindrosporium negundinis**; **Cristulariella pyramidalis**.  
 LEAF SPOT, Tar. **Rhytisma punctatum**, CA, NY; **R. acerinum**, OR, WA.  
 POWDERY MILDEW. **Phyllactinia corylea**, SD; **Microspheera alni**, **Uncinula circinata**; **Sawadaea bicornis**, WI.  
 ROT, Root. **Phymatotrichum omnivorum**, CA, TX; **Helicobasidium purpureum**, TX.  
 WILT. **Verticillium albo-atrum**, occasional.

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### Boxwood (*Buxus*)

BLIGHT, Box. **Cylindrocladium pseudonaviculatum**, NC.  
 BLIGHT, Leaf Cast. **Hyponectria buxi**, general; **Verticillium buxi**, cosmopolitan on dead leaves, often associated with *Hyponectria*.  
 BLIGHT, Leaf Tip. **Phoma conidiogena**, MD, NJ, NY, OK.  
 CANKER, "Nectria"; Leaf Blight. **Volutella buxi**, general; considered imperfect stage of *Pseudonectria rouselliana* but unconfirmed connection.  
 CANKER; DIEBACK. **Fusarium buxicola** (*Nectria desmazierii*), AL, MD, PA; **F. lateritium** (see ► *Gibberella baccata*), secondary, MD, SC, VA.  
 LEAF SPOT. **Phyllosticta auerswaldii**, MD, MA, NJ, NY, VA, WA; **Macrophoma candollei**, prominent, general on dead leaves following winter injury or disease.  
 NEMATODE, Dagger. **Xiphinema americanum**.  
 NEMATODE, Lesion. **Pratylenchus pratensis**; **P. vulnus**, NC.  
 NEMATODE, Root Knot. **Meloidogyne hapla**; **M. incognita**; **M. incognita acrita**; **M. javanica**; **M. arenaria**, NC.  
 NEMATODE, Spiral. **Helicotylenchus nannus**; **Rotylenchus buxophilus**.

NEMATODE, Stubby Root. **Trichodorus** sp.  
 NONPARASITIC. **Freezing**. Ice standing on stems causes bark to slough off and branches die back for months thereafter.  
**Sunscald**. Injury in late winter or early spring when covering is removed in bright sun or high wind.  
 ROT, Root. **Armillaria mellea**, NJ; **Fusarium oxysporum** and **F. solani**, MD, perhaps secondary; **Phymatotrichum omnivorum**, TX; **Phytophthora parasitica**, MD, NC; **P. cactorum**, NC; **P. citrophthora**, NC; **Pythium** sp., MA; **Rhizoctonia solani**, cosmopolitan after nematode injury.  
 ROT, Heart; Trunk. **Ganoderma lucidum**, VA; **Fomes igniarius**, VA; **Poria punctata**, VA.  
 ROT, Root; Decline. **Paecilomyces buxi** and some **Fusaria**, VA.  
 VIRUS. **Variation**, cause unknown, MD, NY, VA.  
 Salmon-pink pustules appearing on backs of leaves, along twigs, and on main stems are indications of *Volutella buxi*, controlled by thorough cleaning, then spraying. Much of the die-back, bronzing, general unhealth of boxwood is due to nematodes, especially spiral and root lesion or meadow.  


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**Brachiaria (Broadleaf signalgrass)**  
 ROT, Root. **Pythium arrhenomanes**, LA.  


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**Brachycome (Swan River Daisy)**  
 BACTERIAL, MLO. **Western Aster Yellows**, CA.  
 VIRUS. **Tomato Spotted Wilt**, PA.  


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**Brachypodium (Slender False-Brome)**  
 ANTHRACNOSE. **Colletotrichum graminicola**, MD.

BACTERIAL Spot. *Pseudomonas coronafaciens* var. *atropurpurea*, ND.  
 ROT, Root. *Curvularia geniculata* and *Fusarium scirpi*, secondary, ND.

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### Brickellia (Brickle-Bush)

DODDER, *Cuscuta exaltata*, TX.  
 LEAF SPOT. *Cercospora coleosanthi*, CA, CO.  
 ROT, Root. *Phymatotrichum omnivorum*, TX.  
 RUST. *Aecidium arcularium* (0, I), AZ, CO, NM; *Coleosporium aridum* (II), CA; *Puccinia kuhniae*, AZ, FL; *P. subdecora* (0, I, II, III), AZ, CO, NM, UT; *Uredo arida* (II), CA.

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### Bristlegrass (*Setaria*)

BLIGHT. *Beniowskia sphaeroidea*, GA, TX.  
 VIRUS. Foxtail Mosaic.

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### Broccoli

►Cabbage.

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### Brodiaea

RUST. *Puccinia carnegiana* (0, I, III), AZ; *P. dichelostemmae* (0, I, III), CA, OR, WA; *P. moreniana* (III), CA; *P. nodosa* (0, I, II, III), CA; *P. pattersoniana*, ID, UT, WA; II, III on grasses; *P. subangulata* (0, I, III), WA; *Uromyces brodiaeae* (0, I, III), CA, OR, WA.

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### Bromegrass, False (*Brachypodium*)

RUST. *Puccinia brachypodii* and *P. striiformis*, Italy, Netherlands.

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### Bromegrass, Smooth (*Bromus*)

BACTERIAL, Halo Blight. *Pseudomonas syringae* pv. *coronafaciens*, AK.

POWDERY MILDEW. *Blumeria graminis*, *Erysiphe graminis*, PA.  
 RUST. *Puccinia recondita*, PA.

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### Bromelia

LEAF SPOT. *Gloeosporium* sp., FL, MD; *Helminthosporium rostratum*, FL.

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### Broom (*Cytisus*)

CANKER. *Diaporthe* spp., NJ, NY; *Dothidea tetraspora*, CA; *Gloeosporium* sp., NJ; *Nectria coccinea*, OR; *Pestalotia polychaeta*, CA; *Phomopsis* sp., MA, NJ; *Physalospora obtusa*, AL. Many are secondary.  
 NEMATODE, LESION. *Pratylenchus pratensis*.  
 ROT, Root. *Thielaviopsis basicola*, WI.

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### Broom, Spanish (*Spartium*)

CANKER. *Diplodia sarothamni*, CA; *Pestalotia polychaeta*, CA; *Phomopsis sarothamni*, CA. All possibly secondary infections.

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### Broussonetia (Paper-Mulberry)

CANKER; DIEBACK. *Nectria cinnabarina*, AL, NY; *Fusarium solani*, OH.  
 MISTLETOE. *Phoradendron serotinum* (*flavescens*), TX.  
 NEMATODE, Root Knot. *Meloidogyne* sp., MD.  
 ROT, Root. *Phymatotrichum omnivorum*, TX; *Armillaria mellea*, CA.

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### Browallia (*Streptosolen jamesonii*)

BACTERIAL Canker; Vascular. *Clavibacter michiganense*, WY.  
 NEMATODE, Root Knot. *Meloidogyne* sp.  
 VIRUS. Tomato Spotted Wilt, CA, OK.  
 WILT. *Fusarium* sp., DE.

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## Brunfelsia

BACTERIAL Canker; Vascular. *Clavibacter michiganense*, WY.

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## Brussel Sprouts

► Cabbage.

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## Bryonopsis

BACTERIAL SPOT. *Pseudomonas lachrymans*, WI.  
DOWNY MILDEW. *Pseudoperonospora cubensis*, MA, OH.

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## Buckeye

► Horse-Chestnut

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## Buckleya

RUST. *Cronartium comandrae* (II, III), TN; 0, I on pine.

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## Buckthorn (Rhamnus)

LEAF, Black. *Phytophthora ramorum*, CA.

LEAF SPOT. *Cercospora aeruginosa*, MO, NE, SC; *C. Bacilligera*; *C. rhamni*, LA, NE, NJ, TX, WI; *Cylindrosporium rhamni*, ID; *Marssonina rhamni*, WA; *Phaeosphaerella rhamni*, CA; *Phyllosticta rhamnigena*; *Septoria blasdalei*, CA, ID, OR, TX.

POWDERY MILDEW. *Microsphaera alni*, WI.

ROT, Heart. *Daedalea unicolor*, WA; *Fomes igniarius*, ID.

ROT, Root. *Phymatotrichum omnivorum*, TX.

RUST. *Puccinia coronata* (0, I), widespread; II, III on grasses, cereals, widespread;

*P. mesneriana* (III), CA.

SOOTY MOLD. *Capnodium* sp., CA.

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## Buckwheat-Tree (*Cliftonia*)

BLACK MILDEW. *Morenoella cliftoniae*, MS.

LEAF SPOT. *Coccomyces* sp.; *Pestalotia cliftoniae*, MS.

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## Buddleia (Butterfly-Bush)

CANKER, Stem. *Phomopsis buddleiae*, AZ.

NEMATODE, Root Knot. *Meloidogyne* spp., AL, MS, TX.

ROT, Root. *Phymatotrichum omnivorum*, TX.

SCAB. *Cladosporium heugelinianum*, DE, VA.

VIRUS, Line Spot. *Tomato Ringspot*, SC.

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## Buffaloberry (Shepherdia)

DAMPING-OFF. *Pythium ultimum*, NE; *Rhizoctonia solani*, NE.

LEAF SPOT. *Septoria shepherdiae*, AK, ID, MT, UT, WI; *Cylindrosporium* sp., Great Plains.

POWDERY MILDEW. *Phyllactinia corylea*, UT; *Sphaerotheca macularis* (*S. humilis*); AK, CO, MT, TX, WY.

ROT, Root. *Phymatotrichum omnivorum*, TX.

ROT, White Heart. *Fomes fraxinophilus*, CO, MT, NM, SD, WY.

RUST. *Puccinia caricis-shepherdiae* (0, I), Rocky Mts., AK, MI, NY, OR, WA; II, III on *Carex*; *P. coronata* (0, I), SD to NM, AK, WA.

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## Buffalograss (*Buchloe*)

DOLLAR SPOT. *Sclerotinia homoeocarpa*, OK.

SMUT. *Tilletia buchloëana*, KS, NE, OK, TX.

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## Bugleweed (*Ajuga*)

BLIGHT, Southern; Crown Rot. *Sclerotium rolfsii*, CA, CT, KS, NJ, NY. Serious in warm, muggy weather.

NEMATODE, Southern Root Knot. *Meloidogyne incognita*, GA.

ROT, Crown and Root. **Phoma** sp. GA.  
 VIRUS. **Cucumber Mosaic**, OH; **Tobacco Streak**, OH.

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## Bumelia

LEAF SPOT. **Cercospora lanuginosa**, TX;  
**Phyllosticta bumeliifolia**, AL, TX;  
**P. curtisii**, FL, MO; **Septoria bumeliae**, MS.  
 ROT, Root. **Helicobasidium purpureum**, TX;  
**Phymatotrichum omnivorum**, TX.

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## Bunchflower (*Melanthium*)

LEAF SPOT. **Septoria allardii**, VA.  
 RUST. **Puccinia atropuncta** (II, III), NC,  
 TN, VA.

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## Bundleflower (*Desmanthus*)

LEAF SPOT. **Cercospora desmanthi**, KS, LA,  
 MO, NM, SD, TN.  
 POWDERY MILDEW. **Erysiphe polygoni**, IL, MS.  
 RUST. **Ravenelia texensis** (II, III), TX.

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## Burnet (*Sanguisorba*)

LEAF SPOT. **Graphium sessile**, NY; **Ovularia bulbigera**, AK, IL.  
 POWDERY MILDEW. **Podosphaera oxyacanthae**, IA;  
**Sphaerotheca macularis**, AK, MA, NY, PA.  
 RUST. **Xenodochus carbonarius** (I, III), AK;  
**X. minor**, AK.

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## Butterfly Flower (*Schizanthus*)

ANTHRACNOSE. **Colletotrichum schizanthi**, NY.  
 BACTERIAL, MLO. **Aster Yellows**, NJ.  
 BACTERIAL Canker; Vascular. **Clavibacter michiganense**, WY.  
 DAMPING-OFF; Root Rot. **Pythium ultimum**, MO;  
**Rhizoctonia solani**, NY.  
 NEMATODE, Root Knot. **Meloidogyne** sp.

ROT, Stem. **Sclerotinia sclerotiorum**, MS,  
 MO.  
 VIRUS. **Tomato Spotted Wilt**, TX.

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## Butterfly Pea (*Centrosema*)

LEAF SPOT. **Cercospora clitoriae**, AL;  
**Colletotrichum** sp., on pods.

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## Butterfly Pea (*Clitoria*)

LEAF SPOT. **Cercospora clitoriae**, AL, FL;  
**C. cruenta**, FL.  
 ROT, Root. **Phymatotrichum omnivorum**, TX.

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## Butterfly Weed; Milkweed (*Asclepias*)

BACTERIAL Blight. **Xanthomonas campestris** pv.  
**asclepiadis**, NE.  
 BLIGHT, Stem. **Phoma asclepiadea**, UT.  
 LEAF SPOT. **Cercospora asclepiadorae**, AL, TX;  
**C. clavata**, general; **C. venturioides**, WA;  
**Phyllosticta tuberosa**, IL, NJ.  
 ROT, Root. **Phymatotrichum omnivorum**, TX.  
 RUST. **Puccinia bartholomaei** (0, I), ND, SD; II,  
 III on *Spartina*; **Uromyces asclepiadis** (II III),  
 widespread.

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## Buttonbush (*Cephalanthus*)

BLIGHT, Leaf. **Cercospora perniciosa**, TX.  
 BLIGHT, Thread. **Pellicularia koleroga**, FL.  
 DODDER. **Cuscuta compacta**, FL;  
**C. gronovii**, NY.  
 LEAF SPOT. **Ascochyta cephalanthi**, LA;  
**Coniothyrium cephalanthi**, LA;  
**Phyllosticta cephalanthi**, TX; **Ramularia cephalanthi**, AL, KS, LA, NY, WI; **Septoria cephalanthi**, KS, WI.  
 POWDERY MILDEW. **Microsphaera alni**, wide-  
 spread. **Phyllactinia corylea**, IN.  
 RUST. **Puccinia seymouriana** (0, I), New  
 England to FL and central states; II, III on  
*Spartina*, **Uredo cephalanthi** (II), FL.

## Cabbage (*Brassica oleracea*) (Including Broccoli, Brussels Sprouts, Cauliflower, Kale, Kohl-rabi)

BACTERIAL Black Rot. *Xanthomonas campestris*, general.

BACTERIAL Blight. *Pseudomonas syringae*, CA; *P. syringae* pv. *alisalensis*, CA, SC; *P. cannabina* pv. *alisalensis*, CA.

BACTERIAL Leaf Spot. *Pseudomonas maculicola*, widespread; *P. cichorii*, FL and inmarket; *Xanthomonas campestris* pv. *armoraciae*, FL, OH; *X. campestris* pv. *campestris*, SC; *Pseudomonas syringae* pv. *maculicola*, CA, OH, SC.

BACTERIAL, MLO. Western Aster Yellows *Phytoplasma*, CA, TX.

BACTERIAL Soft Rot; Stump Rot; *Erwinia carotovora*, cosmopolitan.

BLACKLEG. *Leptosphaeria biglobosa*, Central States, Mexico.

BLACKLEG; Leaf Spot. *Phoma lingam*, general east of Rocky Mts., also OR, WA.

BLIGHT, Gray Mold. *Botrytis cinerea*, FL; Pacific states, frequent.

BLIGHT, Southern. *Sclerotium rolfsii*, NC to FL, TX, occasional.

CANKER, Stem. *Botrytis cinerea*, WA.

CLUB ROOT. *Plasmodiophora brassicae*, general.

DAMPING-OFF; Bottom Rot. *Pythium* spp.; *P. polymastum*, CA; *Rhizoctonia solani*, general.

DOWNY MILDEW. *Peronospora parasitica*, general.

LEAF SPOT, Gray. *Alternaria brassicae*, general; Black Spot, Head Browning, *A. brassicicola*, general; *A. oleraceae*, occasional; *Cercospora brassicola*, CA, DE, FL, IL, MS, NC, OK; *Phyllosticta brassicicola*, CA; *Leptosphaeria maculans*, WI.

LEAF SPOT; White Spot. *Cercospora brassicae*, IN, OR, PA; Ring Spot, *Mycosphaerella brassicicola*, AL, CA, IL, NY, OR, TX, WA; *Pseudocercospora capsellae*, CA.

MOLD, Leaf. *Heterosporium variabile*, MT, NY; Seed, *Curvularia geniculata*; *Stemphylium botryosum*.

NEMATODE. *Nacobbis batatiformis*.

NEMATODE, Cabbage Cyst. *Heterodera cruciferae*. Sugar-Beet, *H. schachtii*.

NEMATODE, Lesion. *Pratylenchus pratensis*. Sting, *Belonolaimus gracilis*; *B. longicaudatus*; Stubby Root, *Trichodorus christiei*.

NEMATODE, Root Knot. *Meloidogyne arenaria*; *M. javanica*.

NONPARASITIC. Brown Heart. Probably boron deficiency.

Chlorosis. Magnesium or manganese deficiency.

Oedema. Excessive water tension, or copper sprays.

Pink Head. Probably genetic.

Tipburn. Potassium deficiency.

Whip-tail. Spindly growth, failure to head, due to acid soil, mineral deficiencies.

POWDERY MILDEW. *Erysiphe polygoni*, AZ, CA, CT, FL, MD, MA, OR; *E. cruciferarum*, CA.

ROT, Cottony; Drop. *Sclerotinia sclerotiorum*, AZ, MA, NY, TX.

ROT, Firm Head. *Sclerotinia sclerotiorum*, CA, NY; *Phytophthora porri*, WI.

ROT, Head. *Fusarium avenaceum*, NY.

ROT, Root. *Macrophomina phaseoli*, CA. on *Brassica campestris*; *Phymatotrichum*, TX; *Phytophthora megasperma*, CA, OR; *P. drechsleri*, KY.

ROT, Root and Crown. *Sclerotinia minor*, CA.

ROT, Root; Damping-off. *Aphanomyces raphani*, WI. Also: *Brassica alboglabra*—Chinese Kale; *B. carinata*—Abyssinian Mustard; *B. napus*—; Rape; *B. perviridis*—Spanish Mustard; *B. robertiana*; *Eruca sativa*—Racuet Salad; *Raphanus raphanistrum*—Wild Radish.

ROT, Soft; Black Mold. *Rhizopus stolonifer*, occasional.

ROT, Sprout. *Alternaria tenuis*, *Rhizoctonia solani*, and *Fusarium* sp. on brussels sprouts.

VIRUS. Cabbage Ring Necrosis; Cauliflower Mosaic, GA; Turnip Mosaic, GA; Beet Curly Top; Tomato Spotted Wilt; Cabbage Leaf Curl, GA.

WHITE RUST; Blister. *Albugo candida*, CA, ID, KY, NE, NC, OH, TX.

WILT, Vascular. *Verticillium dahliae*, CA.

WILT, Yellows. *Fusarium oxysporum* f. sp. **conglutinans**, general.

A general control program starts with choosing varieties resistant to *Fusarium* yellows, purchasing disease-free seed or having it hot-water treated against blackleg and black rot, growing in soil free from club root and careful cleaning up of all vegetable refuse at the end of the season.

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### Cactus (*Cereus*)

ANTHRACNOSE. *Mycosphaerella opuntiae*, TX.

BACTERIAL Soft Rot. *Erwinia carotovora*, TX.

BLIGHT, Gray Mold; Rot. *Botrytis cinerea*, occasional when too damp, indoors.

LEAF SCORCH. *Hendersonia opuntiae*, TX.

LEAF SPOT, Black. *Diplothea (Stevensea) wrightii*, TX; Stem, *Septoria cacticola*, TX.

NEMATODE, Cyst. *Heterodera cacti*; *Nacobbis batatiformis*.

NEMATODE, Root Knot. *Meloidogyne* sp.

ROT, Dry. *Poria* sp., CA.

ROT, Stem and Branch. *Aspergillus alliaceus*, TX.

ROT, Root and Stem. *Fusarium oxysporum*, AZ, CA; *Helminthosporium cactivorum*, CA, TX; *Phymatotrichum omnivorum*, TX.

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### Cactus (*Leuchtenbergia principis* and *Schlumbergera gaertneri* "Makoyana")

NEMATODE, Cyst. *Heterodera cacti*.

VIRUS. Tomato Spotted Wilt, PA.

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### Cactus, Fishhook, Pincushion (*Mammillaria*)

ANTHRACNOSE; Zonate Spot. *Gloeosporium cactorum*; *Mycosphaerella opuntiae*; Spine Spot, *Phoma mammillariae*, MT.

NEMATODE, Root Knot. *Meloidogyne incognita*, Bermuda Bot. Gard; *Meloidogyne* sp., TX; Cyst, *Heterodera cacti*.

ROT, Root. *Phymatotrichum omnivorum*, TX.

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### Cactus, Giant, Saguaro (*Carnegiea*)

BACTERIAL Blight. *Erwinia carnegieana*, AZ.

BACTERIAL Crown Gall. *Agrobacterium tumefaciens*, AZ.

ROT, Dry. *Poria carnegieae*; Heart, *Fomes robustus*.

ROT, Seedling. *Fusarium solani*; *F. oxysporum*.

VIRUS. Saguaro Cactus, AZ.

The bacterial blight is spread over the whole giant cactus area in Arizona, with mortality heaviest in magnificent specimens 150 to 200 years old.

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### Cactus, Prickly Pear (*Opuntia*)

ANTHRACNOSE; Zonate Spot. *Gloeosporium cactorum*, FL, MS; Black Rot, *Mycosphaerella opuntiae*, AL, FL, LA, NY, SC, TX.

BACTERIAL Rot. *Erwinia aroideae*, FL, MS, OK, TX.

BLACK MILDEW. *Lembosia cactorum*, FL.

LEAF SCORCH. *Hendersonia opuntiae*, AL, KS, MT, NJ, TX.

LEAF SPOT, Black. *Diplothea wrightii*, FL, TX.

NEMATODE, Root Knot. *Meloidogyne* sp.

NONPARASITIC. *Oedema*, causing glassiness or scab, from overwatering.

ROT, Charcoal. *Macrophomina phaseoli*, TX.

ROT, Cladode. *Aspergillus alliaceus*, TX; *Diplodia opuntiae*, MD, KS, PA; *Physalospora obtusa*, NY; *P. rhodina*, FL; *Phyllosticta cacti*, NM; *P. concava*, MO, NJ, OK, TX; *Septoria fici-indicae*, TX.

ROT, Root. *Armillaria mellea*, CA.

ROT, Stem. *Phytophthora parasitica*, NY; *Pythium debaryanum*, CA.

VIRUS. Mosaic, MD; Chlorotic Ring Spot, AZ, CA, ID, MT, NM, UT, WA, WY; *Opuntia Sammons*, AZ; Tomato Spotted Wilt, PA.

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### Cactus, Star, Sea-Urchin, Barrel (*Echinocactus*)

ANTHRACNOSE. *Mycosphaerella opuntiae*, TX.

LEAF SCORCH; Scald. *Hendersonia opuntiae*, TX.

LEAF SPOT, Black. *Diplothea* sp., TX.  
 ROT, Root. *Phymatotrichum omnivorum*, TX;  
 Stem, *Aspergillus alliaceus*, TX.

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## Caesalpinia

ANTHRACNOSE. *Gloeosporium* sp., FL.  
 BACTERIAL Crown Gall. *Agrobacterium tumefaciens*, FL.  
 CANKER; DIEBACK. *Botryosphaeria ribis* var. *chromogena*, FL, TX.  
 ROT, Root. *Clitocybe tabescens*, FL;  
*Phymatotrichum omnivorum*, TX.  
 RUST. *Ravenelia humphreyana* (II, III), FL.

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## Caladium

BACTERIAL Soft Rot. *Erwinia carotovora*, FL.  
 BLIGHT, Southern. *Sclerotium rolfsii*, FL.  
 BLIGHT; Tuber Rot. *Botrytis ricini*, FL.  
 LEAF SPOT. *Gloeosporium thuemenii*, FL.  
 NEMATODE, Citrus. *Tylenchulus semipenetrans*, FL.  
 NEMATODE, Lesion. *Pratylenchus* sp., FL.  
 NEMATODE, Root Knot. *Meloidogyne* sp., FL,  
 MS; *M. javanica*.  
 ROT, Tuber. *Fusarium solani*, FL.

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## Calathea

LEAF SPOT. *Glomerella cincta*, NJ; *Phyllosticta* sp.; *Alternaria alternata*, FL; *Drechslera setariae*, FL.  
 NEMATODE, Burrowing. *Radopholus similis*, FL.  
 Spiral, *Helicotylenchus nannus*.

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## Calceolaria (Slipperwort)

BLIGHT, Gray Mold. *Botrytis cinerea*, AK.  
 NEMATODE, Leaf. *Aphelenchoides fragariae*.  
 NONPARASITIC. Boron Deficiency, leaf necrosis, CA.  
 ROT, Root. *Pythium mastophorum* and *P. ultimum*, CA.

ROT, Stem. *Sclerotinia sclerotiorum*, NY, WA.  
 VIRUS. Tomato Spotted Wilt, CA.  
 WILT. *Verticillium albo-atrum*, NY, WA.

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## Calendula (Pot Marigold)

BACTERIAL, MLO. Aster Yellows, CT, DE, ME, NJ, PA, VA; California Aster Yellows, CA.  
 BLIGHT, Gray Mold. *Botrytis cinerea*, AK, MO, NJ, NY.  
 BLIGHT, Southern. *Sclerotium rolfsii*, TX.  
 LEAF SPOT. *Alternaria* sp., NY; *Cercospora calendulae*, PA, TX, VA; *Colletotrichum gloeosporioides*, VA.  
 NEMATODE, Root Knot. *Meloidogyne* spp., TN, TX, WV; *M. javanica*.  
 POWDERY MILDEW. *Golovinomyces cichoracearum*, CA, NY; *Erysiphe polygoni*, PA.  
 ROT, Root. *Rhizoctonia solani*, IN, NJ, NC, TX; *Pythium ultimum*, CA; *Phymatotrichum omnivorum*, TX.  
 ROT, Stem; Wilt. *Sclerotinia sclerotiorum*, CA, FL, LA, MO, OH, TX.  
 RUST. *Puccinia flaveriae* (III), IL, IN, IA, KS, MO, NE, TX.  
 SMUT, White. *Entyloma calendulae*, CA, NH, OR; *E. compositarum*, WA.  
 VIRUS. Cucumber Mosaic, Tomato Spotted Wilt, CA, MI, TX; *Bidens Mottle*, FL.

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## Calibrachoa (*Calibrachoa* sp.)

VIRUS. *Calibrachoa Mottle*, CA; Tobacco Mild Green Mosaic, MS.

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## California-Bluebell (*Phacelia*)

LEAF SPOT. *Cylindrosporium phaceliae*, MT, TX.  
 POWDERY MILDEW. *Golovinomyces cichoracearum*, CA, MT, NM, TX.  
 RUST. *Puccinia aristidae* (0, I); II, III on wild grasses; *P. phaceliae* (III); *P. recondita* (0, I),



MT to CO, CA, NM, OR; II, III on brome-grass; *Uredo contraria* (II), CA.

VIRUS. **Beet Curly Top**, CA.

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### California-Laurel (*Umbellularia*)

ANTHRACNOSE. *Kabatiella phorodendri* f. sp. **umbellulariae**, CA.

BACTERIAL Leaf Spot. *Pseudomonas lauraceum*, CA.

BLACK MILDEW. *Asterina anomala*, CA.

BLIGHT, Leaf. *Colletotrichum gloeosporioides*.

CANKER; DIEBACK. *Nectria cinnabarina*; **N. coccinea**, CA.

LEAF SPOT, Sudden Oak Death. *Phytophthora ramorum*, CA.

NEMATODE, Pin. *Paratylenchus (Gracilacus) anceps*. Ring, *Criconemoides xenoplax*, CA; Sheath *Hemicycliphora brevis*, CA.

NEMATODE, Root Knot. *Meloidogyne hapla*, CA.

ROT, Wood. *Fomes* spp., *Lenzites betulina*;

**Polyporus versicolor**; **Porioambigua**;

**P. ferruginosa**; **Stereum albobadium**;

**Schizophyllum commune**.

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### California Pepper-Tree (*Schinus*)

DODDER. *Cuscuta subinclusa*, CA.

LEAF SPOT. *Rhizoctonia solani*, FL.

NEMATODE, Root Knot. *Meloidogyne* sp., TX.

ROT, Heart. *Fomes applanatus*, CA; **Polyporus dryophilus**, CA; **P. farlowii**, AZ, CA; **P. sulphureus**; **P. versicolor**, CA.

ROT, Root. *Armillaria mellea*, CA; **Phymatotrichum omnivorum**, TX.

ROT, Wood. *Ganoderma polychromum*, CA;

**Stereum hirsutum**; **Trametes hispida**, CA;

**Schizophyllum commune**.

WILT. *Verticillium albo-atrum*, CA; *Raffaelea lauricola*, CA.

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### California Pitcher-Plant (*Darlingtonia*)

LEAF SPOT. *Mycosphaerella sarraceniae*, CA; *Sectoria darlingtoniae*, OR.

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### California Poppy (*Eschscholtzia*)

BACTERIAL Blight. *Xanthomonas papavericola*, TX.

BACTERIAL, MLO. Aster **Yellows**, NJ, NY; and **California Aster Yellows**, CA.

BLIGHT, Gray Mold. *Botrytis cinerea*, AK.

LEAF SPOT, Mold. *Heterosporium eschscholtziae*, CA.

NEMATODE, Root Knot. *Meloidogyne* sp., FL, TX.

POWDERY MILDEW. *Erysiphe polygoni*, CA.

ROT, Collar. *Alternaria* sp., TX.

SMUT, Leaf. *Entyloma eschscholtziae*, CA.

WILT. *Verticillium albo-atrum*, CA.

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### California-Rose (*Convolvulus japonicus*)

LEAF SPOT. *Phyllosticta batatas*, SC; **Septogloeum convolvuli**, CA, WI; *Septoria calystegiae*, CA; *S. convolvuli*, WI; *S. flagellaris*, NY.

RUST. *Coleosporium ipomoeae* (II, III), LA, MA, 0, I on pine; *Puccinia convolvuli* (0, I, II, I, II), CA, OR.

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### Calla, Common, Golden, Pink (*Zantedeschia*)

BACTERIAL Soft Rot. *Erwinia aroideae*, general; **E. carotovora**.

BLIGHT, Gray Mold. *Botrytis cinerea*, AK, NJ.

BLIGHT, Southern. *Sclerotium rolfsii*, CA, FL, OR.

LEAF SPOT. *Alternaria* sp., secondary; **Cercospora richardiae**, AL, MS; **Coniothecium richardiae**, CA, FL, MA, NJ, NY, OR; **Gloeosporium callae**, WA.

NEMATODE, Root Knot. *Meloidogyne* sp., CA, FL.

NONPARASITIC. **Chalk rot**. Immaturity of rhizomes, CA, OR.

POWDERY MILDEW. *Leveillula taurica*, CA.

ROT, Rhizome. *Phytophthora cryptogea* var. **richardiae**, CA, FL, IL, MA, NJ, NY, OH, OR, PA, WA; **P. erythrosetpica**, CA; **Phoma** sp., CA, OR.

ROT, Root. *Armillaria mellea*, CA; *Rhizoctonia solani*, CA.

VIRUS. **Dasheen Mosaic; Tomato Spotted Wilt**, CA, IL, IN, MD, NY, OR, TX, WA; **Calla Chlorotic Spot**, U.S.

Root and rhizome rots are controlled by treating rhizomes before planting and growing in pots rather than benches. Specimens showing spotted wilt must be destroyed before thrips spread the virus.

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### **Calla, Wild (*Calla palustris*)**

LEAF SPOT. *Cercospora callae*, MA, NY, WI; *Marssonina callae*, NY.

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### **Calliandra (False-Mesquite)**

ROT, Root. *Clitocybe tabescens*, FL.  
RUST. *Ravenelia reticulatae* (II, III), AZ.

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### **Callicarpa (Beauty-Berry; French-Mulberry)**

BLACK MILDEW. *Meliola cookeana*, FL, LA.  
LEAF SPOT. *Cercospora callicarpae*, SC to TX.  
NEMATODE, Burrowing. *Radopholus similis*, FL.

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### **Calycanthus (Sweetshrub, Carolina Allspice)**

BACTERIAL Crown Gall. *Agrobacterium tumefaciens*, MS, NY.  
CANKER. *Botryosphaeria calycanthi*, NC, VA.  
POWDERY MILDEW. *Phyllactinia corylea*, CA.

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### **Camass (*Camassia*)**

BLIGHT, Gray Mold. *Botrytis cinerea*, OR.  
LEAF SPOT. *Septoria chlorogali*, OR.  
ROT, Root. *Phymatotrichum omnivorum*, TX.  
SMUT, Leaf. *Urocystis colchici*, IN, OR.

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## **Camellia**

BACTERIAL Crown Gall. *Agrobacterium tumefaciens*, WA.

BLACK MILDEW. *Meliola camelliae*.

BLIGHT. *Phytophthora ramorum*, CA, OR, WA.

BLIGHT, Flower. *Sclerotinia camelliae*, CA, GA, LA, MS, NC, SC, TX, VA; *S. sclerotiorum*, NC; *Pestalotia* sp., *Penicillium* sp., AL.

BLIGHT, Gray Mold; Bud and Flower. *Botrytis cinerea*, general after frost.

BLIGHT, Petal. *Pestalotia* sp., AL.

CANKER; DIEBACK. *Glomerella cingulata*, widespread; *Botryosphaeria ribis*, MS; *Phomopsis* sp., FL.

CANKER, Felt Fungus. *Septobasidium castaneum*; *S. conidiophorum*; *S. pseudopedicellatum*, SC.

DODDER. *Cuscuta* sp.

GALL, Leaf. *Exobasidium camelliae*, and var. *gracilis* on *Camellia sasanqua*, FL, LA, MS, TX; *E. monosporum*, AL.

LEAF SPOT. *Cercospora* sp., GA; *C. theae*, LA; *Hendersonia subalbicans*, GA; *Pestalotia quepini*, also twig blight, widespread; *Phyllosticta camelliae* and *P. camelliaeicola*, Southeast; *Sporonema camelliae*.

LEAF SPOT, Algal. *Cephaleuros virescens*, Gulf states.

NEMATODE, Burrowing. *Radopholus similis*, FL.

NEMATODE, Lesion. *Pratylenchus coffeae*.

NEMATODE, Ring. *Criconemoides komabaensis*, FL; *Hemicriconemoides gaddi*, GA, LA.

NEMATODE, Root Knot. *Meloidogyne incognita*.

NEMATODE, Spiral. *Helicotylenchus nannus*.

NONPARASITIC. **Bud Drop, Dieback**. Malnutrition, freezing, desiccation, widespread.

**Oedema**. Corky excrescences, from disturbed water relations.

**Sunscaud**. Light circular spots, often with secondary fungi.

ROT, Root. *Phytophthora cinnamomi*, major problem, AL, CA; *Clitocybe tabescens*, FL, LA.

SPOT ANTHRACNOSE, Scab. *Elsinoë leucospila*, FL, GA, LA.

**VIRUS. Camellia Yellow Mottle Leaf** (color-breaking strains).

Flower blight is a devastating disease that has spread with plants in cans or pots. Order camellias bare-rooted, with all flower buds showing color picked off. Dieback is the subject of much controversy among camellia fans. Drastic surgery and a copper spray early in the season to prevent infection through bud scars seems to be helpful. Chelated iron may mask color-breaking virus symptoms.

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### Camomile (*Anthemis*)

**BACTERIAL, MLO. California Aster Yellows**, CA.

**DAMPING-OFF. Rhizoctonia solani**, WA.

**NEMATODE, Root Knot. Meloidogyne** sp., FL, MD.

**ROT, Root. Phymatotrichum omnivorum**, TX.

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### Campanula (Bellflower, Canterbury)

**BACTERIAL, MLO. Aster Yellows**, PA.

**BACTERIAL, Proliferation. Rhodococcus fascians**, OR.

**BLIGHT, Gray Mold. Botrytis cinerea**, AK.

**BLIGHT, Southern. Sclerotium rolfsii**, IL, NJ.

**LEAF SPOT. Ascochyta bohémica**, WI; **Cercoseptoria minuta**, WI; **Phyllosticta alliariifoliae**, NJ, NY; **Ramularia macrospora**, AK; **Septoria campanulae**, IL, IA, KS, MO, WI.

**NEMATODE, Leaf. Aphelenchoides** sp.

**NEMATODE, Root Knot. Meloidogyne** sp.

**POWDERY MILDEW. Golovinomyces cichoracearum**, PA.

**ROT, Root. Fusarium** sp., NY, NJ; **Rhizoctonia solani**, CT, IL, TX.

**ROT, Stem. Sclerotinia sclerotiorum**, MD, WA.

**RUST. Coleosporium campanulae** (II, III), widespread; 0, I on pine; **Aecidium campanulastrum** (0, I), IA, MN; **Puccinia campanulae** (III), CA, MT, NY, OR, WA.

**VIRUS. Tomato Spotted Wilt**, CA.

**WILT. Verticillium albo-atrum**.

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### Camphor-Tree (*Cinnamomum*)

**ANTHRACNOSE. Glomerella cingulata**, Gulf states.

**BLACK MILDEW. Lembosia camphorae**, FL.

**CANKER; DIEBACK. Diplodia camphorae, D. natalensis, D. tubericola**, widespread; **Gloeosporium camphorae** and **G. ochraceum**, also leaf spot, Gulf states.

**LEAF SPOT, Algal. Cephaleuros virescens**, FL to LA.

**MISTLETOE. Phoradendron serotinum (flavescens)**, FL.

**NEMATODE, Lesion. Pratylenchus pratensis**, FL.

**NONPARASITIC. Chlorosis.** Manganese deficiency, FL.

**POWDERY MILDEW. Microsphaera alni** var. **cinnamomi**, LA.

**ROT, Root. Armillaria mellea**, FL; **Phymatotrichum omnivorum**, TX; **Clitocybe tabescens**, FL.

**SPOT ANTHRACNOSE. Elsinoë cinnamomi**, MS, SC.

**WILT, Laurel. Raffaelea lauricola**, GA, FL.

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### Candlestick Shrub (*Cassia*)

**LEAF SPOT. Tubakia dryina**, LA.

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### Candytuft (*Iberis*)

**BLIGHT, Gray Mold. Botrytis cinerea**, AK.

**CLUB ROOT. Plasmodiophora brassicae**, MS, NJ.

**DODDER. Cuscuta indecora**, TX.

**DOWNY MILDEW. Peronospora parasitica**, CA.

**NEMATODE, Root Knot. Meloidogyne** sp., AL.

**POWDERY MILDEW. Erysiphe polygoni**, CA.

**ROT, Root. Phoma lingam**, CA; **Pythium oligandrum**, ME.

**VIRUS. Lettuce Mosaic**, NY.

**WHITE RUST. Albugo candida**, CA.

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### Canna

**BLIGHT, Southern. Sclerotium rolfsii**, TX.

**LEAF SPOT. Alternaria** sp., MI, SC, TX.

NEMATODE, Buitowing. **Radopholus similis**.  
 ROT, Rhizome. **Fusarium** sp., MN, MO, PA.  
 RUST. **Puccinia cannae** (II, III), FL, OH, TX;  
**P. thaliae**, LA.  
 VIRUS. **Cucumber Mosaic**, OH, RI; **Mosaic**;  
 unidentified, DE, MD, MI, NY; **Canna Yellow Mottle**, WA, Pacific Northwest; **Hosta Virus X**, **Tobacco Rattle Virus**; **Helleborus Net Necrosis**; **Nemesia Ring Necrosis**, **Diascia Yellow Mottle**, Pacific Northwest.

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### Canola (*Brassica napus*)

BLACK LEG. **Septosphaeria maculans**, KY;  
**Leptosphaeria maculans**, Canada, ND,  
 (Winter Canola) OK.  
 DECLINE SYNDROME. Causal agent unknown, GA,  
 KY, TN.  
 PHYTOPLASMA. **Candidatus asteris** (also on **Brassica rapa**), Saskatchewan, Canada.  
 ROT, Damping-off. **Rhizoctonia solani**, WA.  
 ROT, Root. **Sclerotinia sclerotiorum**, GA, TX.  
 STUNTING, Clubroot. **Plasmodiophora brassicae**, ME.

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### Cantaloupe

► Melon.

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### Cape-Cowslip (*Lachenalia*)

VIRUS. **Ornithogalum Mosaic**, AL.

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### Cape-Honeysuckle (*Tecomaria*)

ANTHRACNOSE. **Colletotrichum gloeosporioides**, TX.  
 ROT, Root. **Armillaria mellea**, CA; **Clitocybe tabescens**, FL.

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### Cape-Marigold (*Dimorphotheca*)

BACTERIAL, MLO. **Aster Yellows**, NJ, NY.

BLIGHT, Gray Mold. **Botrytis cinerea**, AK, CT.  
 DOWNY MILDEW. **Plasmopara halstedii**, IA, ND.  
 NEMATODE, Root Knot. **Meloidogyne** sp., FL.  
 ROT, Charcoal. **Macrophomina phaseoli**, CA.  
 ROT, Root. **Pythium ultimum**, CA; **Rhizoctonia solani**, IL.  
 RUST. **Puccinia flaveriae** (III), IL, IN, NE, NJ.  
 VIRUS. **Curly Top Virus (Beet)** on *Dimorphotheca pluvialis* var. *fangens* and *D. sinuata*.  
 WILT. **Fusarium** sp., FL.

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### Capeweed, Cape Dandelion (*Arctotheca calendula*)

BLIGHT; ROT, Root, Crown and Stolon. **Sclerotium rolfsii**, CA.

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### Caper (*Capparis*)

BLACK MILDEW. **Asterina lepidigenoides**, FL;  
**A. radians**, FL.

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### Caraway (*Carum*)

BACTERIAL, MLO. **California Aster Yellows**, WA.  
 DODDER. **Cuscuta** sp., WA.  
 NEMATODE, Root Knot. **Meloidogyne** sp.  
 ROT, Stem. **Sclerotinia sclerotiorum**, WA.

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### Cardoon (*Cynara cardunculus*)

LEAF SPOT. **Cercospora obscura**, CA, TX;  
**Ramularia cynarae**, CA.  
 POWDERY MILDEW. **Golovinomyces cichoracearum**, CA.

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### Carissa

CANKER; DIEBACK. **Physalospora obtusa** and **P. rhodina**, FL.  
 LEAF SPOT. **Colletotrichum gloeosporioides**, FL;  
**Macrophoma** sp., CA; **Septoria** sp., CA.

NEMATODE, Root Knot. **Meloidogyne** sp., CA, FL.  
 ROT, Root. **Phymatotrichum omnivorum**, TX.

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### Carissa (Natal-Plum)

CANKERS; GALL. **Sphaeropsis tumefaciens**, FL.

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### Carnation (*Dianthus caryophyllus*)

ANTHRACNOSE. **Colletotrichum** sp., NJ, NY, TX.  
 BACTERIAL Blight. **Pseudomonas woodsii**, HI.  
 BACTERIAL Crown Gall. **Agrobacterium tumefaciens**, MD.  
 BACTERIAL Fasciation; Witches' Broom. **Clavibacter fascians**, CA, OH.  
 BACTERIAL, MLO. **Aster Yellows**.  
 BACTERIAL Pimple. **Xanthomonas oryzae**.  
 BACTERIAL Spot. **Pseudomonas woodsii**, MS to GA, IN, MI, ND, OK, OR, WA.  
 BACTERIAL Wilt. **Pseudomonas caryophylli**, IL, IN, IA, MA, MO, WA.  
 BLIGHT, Branch and Collar Rot. **Alternaria dianthi**, general.  
 BLIGHT, Gray Mold. **Botrytis cinerea**, cosmopolitan in high humidity.  
 BLIGHT, Petal. **Stemphylium floridanum**, FL.  
 BLIGHT, Southern. **Sclerotium rolfii**, FL, MS, TX.  
 BLIGHT, Web. **Pellicularia koleroga**, NC.  
 BLOTCH, Greasy. **Zygomphala jamaicensis**, CA, PA.  
 DOWNY MILDEW. **Peronospora dianthicola**, CA.  
 LEAF SPOT, Mold; Fairy Ring. **Heterosporium echinulatum** occasional in greenhouses, CA, TX; **Cladosporium herbarum**, secondary, general.  
 LEAF SPOT. **Cladosporium echinulatum**, HI; **Septoria dianthae**, VT to SC, CA, MI, TX.  
 NEMATODE, Cyst. **Heterodera trifolii**.  
 NEMATODE, Lance. **Hoplolaimus coronatus**.  
 NEMATODE, Pin. **Paratylenchus dianthus**.  
 NEMATODE, Ring. **Criconemoides curvatum**.  
 NEMATODE, Root Knot. **Meloidogyne arenaria**; **M. hapla**; **M. incognita acrita**; **M. javanica**.  
 NONPARASITIC. **Yellow Spotting**. Potassium deficiency, NJ, NY.

PETAL SPOT. **Bipolaris (Helminthosporium) setariae**, FL.

POWDERY MILDEW. **Oidium** sp., FL, NC; **O. dianthi**, CA.

ROT, Bud. **Fusarium tricinctum** f. sp. **poae**, MA to VA, KS, NE, WA.

ROT, Root. **Phymatotrichum omnivorum**, TX; **Pythium** sp., IL; **Rhizoctonia solani**, general; **Armillaria mellea**, CA.

ROT, Stem. **Armillaria mellea**, CA; **Fusarium cerealis**, general.

RUST. **Uromyces dianthi** (II, III), general.

SMUT. Anther. **Ustilago violaceae**, MA.

VIRUS. **Carnation Latent**; **Carnation Mosaic**; **Carnation Mottle**; **Carnation Ring Spot**; **Carnation Streak**; **Carnation Yellows**; **Carnation Etch-Ring**; **Beet Curly Top**, CA, TX; **Carnation Necrotic Fleck**, CA; **Carnation Italian Ring Spot**; **Carnation Vein Mottle**; **Carnation Yellow Fleck and Necrotic Fleck**, OR.

WILT. **Fusarium oxysporum** f. sp. **dianthi**; **Verticillium albo-atrum (dahliae)**, NJ; **Phialophora (Verticillium) cinerescens**, NY.

A rigid sanitation program is necessary for healthy carnations, taking cuttings high on the plant, breaking instead of cutting, planting in sterile medium, controlling aphids and other insect vectors of virus diseases and controlling mites that spread bud rot. The mother block system controls wilts; heat cures wilts; heat cures viruses.

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### Carob, St. Johns Bread (*Ceratonia*)

CANKER. **Botryosphaeria ribis**, CA.

NEMATODE, Root Knot. **Meloidogyne** spp.

ROT, Root. **Phymatotrichum omnivorum**, TX; **Phytophthora cactorum**, CA.

WILT. **Verticillium albo-atrum**, CA.

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### Carolina Geranium (*Geranium carolinianum*)

BLIGHT, Stem and Leaf. **Sclerotinia minor**, NC.

VIRUS. **Tomato Spotted Wilt**, GA.

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**Carolina Jessamine (*Gelsemium*)**

BLACK MILDEW; Black Spot. *Asterina somatophora*, FL.

LEAF SPOT. *Phyllosticta gelsemii*, NJ.

ROT, Root. *Phymatotrichum omnivorum*, TX.

SOOTY MOLD. *Capnodium grandisporum*, MS, TX.

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**Carolina Moonseed (*Cocculus*)**

LEAF SPOT. *Cercospora cocculicola*, OK; *C. menispermi*, MS, TX.

NEMATODE, Burrowing. *Radopholus similis*, FL.

ROT, Root. *Phymatotrichum omnivorum*, TX.

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**Carpetweed (*Mollugo*)**

VIRUS. Tomato Spotted Wilt, GA.

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**Carrot (*Daucus carota* var. *sativa*)**

BACTERIAL Blight. *Xanthomonas carotae*, CA, ID, IA, WI.

BACTERIAL Core-Rot. *Erwinia chrysanthemi* and/or *E. carotovora* var. *carotovora*, IL.

BACTERIAL, MLO. Aster **Yellows**, widespread and California strain, CA, ID, OR, WA.

BACTERIAL Soft Rot. *Erwinia carotovora*, general.

BLIGHT, Early; Leaf Spot. *Cercospora carotae*, general.

BLIGHT, Late. *Alternaria dauci*, general.

BLIGHT, Southern. *Sclerotium rolfsii*, GA to FL, CA, TX.

CANKER, Root; Storage Rot. *Rhizoctonia* spp., MI, NY, OR, WA.

DAMPING-OFF. *Pythium* sp., ID; *Rhizoctonia solani*, general.

DODDER. *Cuscuta* sp., ID, MS, NM, NY, TX, WV.

LEAF SPOT. *Ramularia* sp., KS; *Alternaria tenuis*, secondary, also seed mold; *Cercospora carotae*, WA.

NEMATODE. *Nacobbis batatiformis*.

NEMATODE, Cyst. *Heterodera carotae*.

NEMATODE, Root Knot. *Meloidogyne arenaria*; *M. incognita*; *M. javanica*.

NONPARASITIC. **Black Heart**. Cause unknown, WI.

**Chlorosis**. Magnesium deficiency in acid soil.

**Root Girdle**. Cause unknown.

POWDERY MILDEW. *Erysiphe polygoni*, CA; *E. heraclei*, NY, NC, WA, Michoacan, Mexico.

ROT, Black. *Alternaria radicina*, ID, MA, MI, NY, PA, WA.

ROT, Black Mold. *Rhizopus* spp.; Blue Mold, *Penicillium* sp.; Gray Mold, *Botrytis cinerea*; Pink Mold, *Trichothecium roseum*, IN.

ROT, Crown. *Rhizoctonia solani*, GA.

ROT, Dry. *Fusarium* spp., ID, NY, associated with scab; *Mycocentrospora acerina*, WA.

R, Root. *Helicobasidium purpureum*, OR, WA; *Phymatotrichum omnivorum*, AZ, LA, TX; *Phytophthora megasperma*, CA; *P. cactorum*, MI; *Sclerotinia minor*, *S. sclerotiorum*, Ontario, Canada.

ROT, Storage. *Centrospora acerina*, NY; *Aspergillus niger*; *Pellicularia filamentosa*; *Typhula* sp.

ROT, Watery Soft. *Sclerotinia sclerotiorum*, general; *S. intermedia*, *S. minor*.

RUST. *Uromyces scirpi* (0, I), OR; II, III on *Scirpus*.

SCAB. *Streptomyces scabies*, CA, MI, PA, WA.

SCAB, Acid. *Streptomyces acidiscabies*, ME.

SPIROPLASMA. **Carrot Purple Leaf**, WA.

VIRUS. **Alfalfa Mosaic**, CA, WA; **Clover Yellow Vein**, WA; **Beet Curly Top**, OR, UT; **Carrot Motley Dwarf**; **Celery Mosaic**; **Carrot Red Leaf**; **Carrot Thin Leaf**, CA; **Lettuce Infectious Yellows**, AZ, CA.

Carrots in home gardens require a deeply dug friable soil even more than treatment for diseases.

Root-knot nematodes are rather common.

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**Carrot, Wild (*Daucus carota*)**

VIRUS. **Alfalfa Mosaic**, WA; **Clover Yellow Vein**, WA.

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**Cascara (*Ramnus ramorum*)**

LEAF SPOT, Black. *Phytophthora ramorum*, CA.

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**Cashew (*Anacardium*)**

BLIGHT, Seedling. *Sclerotium rolfsii*, FL.

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**Cassabana, Curuba (*Sicana*)**

ANTHRACNOSE. *Colletotrichum lagenarium*, FL.

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**Cassia (*Senna*, Sicklepod, Partridgepea)**

BLIGHT, Seedling. *Alternaria cassiae*, MS.

CANKER, Stem. *Diaporthe phaseolorum* var. *caulivora*, LA.

DIEBACK. *Diplodia natalensis*, TX.

LEAF SPOT. *Cercospora nigricans*, MS; *Septoria cassiicola*; *Tubakia dryina*, LA.

NEMATODE, Root Knot. *Meloidogyne* sp., CA, TX.

POWDERY MILDEW. *Microsphaera alni*, MD; *Erysiphe polygoni*.

ROT, Black. *Cylindrocladium parasiticum*, GA.

ROT, Root. *Clitocybe tabescens*, FL; *Phymatotrichum omnivorum*, TX.

WILT. *Fusarium oxysporum* f. sp. *cassiae*, FL, GA, NC, SC.

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**Cassiope**

LEAF GALL. *Exobasidium vaccinii*, WA.

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**Castor-Bean (*Ricinus communis*)**

BACTERIAL Crown Gall. *Agrobacterium tumefaciens*.

BACTERIAL Leaf Spot. *Xanthomonas ricinicola*, MD, OK, TX.

BACTERIAL Wilt. *Pseudomonas solanacearum*, AL, FL, GA, MI.

BLIGHT, Inflorescence; Gray Mold. *Botryotinia ricini*, GA to FL, TX.

BLIGHT, Southern. *Sclerotium rolfsii*.

DAMPING-OFF. *Rhizoctonia solani*, FL, KS.

GALL. *Synchytrium* sp., TX.

LEAF SPOT. *Alternaria* sp., FL, LA, TX; *Cercospora canescens*, AL, KS, MT; White Spot, *C. ricinella*; *C. coffeicola*, Brazil; *Corynespora cassiicola*.

NEMATODE, Root Knot. *Meloidogyne* sp., OK.

NEMATODE, Burrowing. *Radopholus similis*, FL.

ROT, Root. *Clitocybe tabescens*, FL; *Phymatotrichum omnivorum*, TX.

ROT, Stem. *Sclerotinia sclerotiorum*, FL; *Phytophthora parasitica*, FL.

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**Casuarina (Australian-Pine)**

NEMATODE, Root Knot. *Meloidogyne* sp., FL.

ROT. *Armillaria mellea*, CA; *Clitocybe tabescens*, FL.

*Casuarina* is particularly susceptible to *Clitocybe* root rot but *C. cunninghamiana* is more resistant than other species.

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**Catalina Cherry (*Prunus lyonii*)**

LEAF SPOT; Shot Hole. *Coryneum beierincki*.

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**Catalpa**

ANTHRACNOSE. *Gloeosporium catalpae*, MD, MA, NJ, NY, PA.

BLIGHT, Southern. *Sclerotium rolfsii*, on seedlings.

DAMPING-OFF. *Rhizoctonia solani*, NE; *Pythium ultimum* (somewhat resistant).

LEAF SPOT. *Alternaria catalpae*, widespread; *Cercospora catalpae*, MA to FL, TX and IA; *Phyllosticta catalpae*, general.

NEMATODE, Root Knot. *Meloidogyne* sp., southern states to OH.

NONPARASITIC. **Chlorosis**. Soil alkalinity. **Leaf Scorch**. Heat, drought.

POWDERY MILDEW. **Microsphaera alni** var. **vaccinii**, MA to AL, IL, NE, TX; **Phyllactinia corylea**, IL, IN, KY, MA, OH, SC, VA.

ROT, Root. **Armillaria mellea**, WA; **Helicobasidium purpureum**, OH; **Phymatotrichum omnivorum**, TX; **Thielaviopsis basicola**, of seedlings.

ROT, Wood. **Collybia velutipes**, IN; **Polyporus** spp.; **Schizophyllum commune**; **Stereum** spp.; **Trametes sepium**.

SOOTY MOLD. **Capnodium axiliatum**, LA, SC.

SPOT ANTHRACNOSE. **Sphaceloma** sp.

WILT. **Verticillium albo-atrum**, IL, IN, KS, MA, NJ, NY, OH, VA.

Leaf spots may cause some defoliation in a wet season, but many years the expense of spraying may be unjustified on a limited budget. **Verticillium** wilt kills street trees.

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### Catha (Arabian-Tea)

BLIGHT, Leaf Tip, **Colletotrichum gloeosporioides**, FL.

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### Catnip (*Nepeta*)

BACTERIAL Leaf Spot. **Pseudomonas tabaci**, WI; **Xanthomonas campestris**, CA.

BLIGHT, Gray Mold. **Botrytis cinerea**, AK.

BLIGHT, Southern. **Sclerotium rolfsii**, TX.

LEAF SPOT. **Ascochyta nepetae**, WI; **Cercospora nepetae**, IL, TX; **Phyllosticta decidua**, IL, NY, OH, WI; **Septoria alabamensis**, AL; **S. nepetae**, WI.

ROT, Root. **Rhizoctonia solani**, TX.

VIRUS. **Cucumber Mosaic**, IN, IA, KS, MI, WI.

WILT. **Fusarium** sp., GA.

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### Cat-Tail (*Typha*)

LEAF SPOT. **Stagonospora typhoidearum**, TX, WI; **Phyllosticta typhina**, NE, NY, OR, TX, WI; **Scolecotrichum typhae**, CO.

MOLD, Leaf. **Cladosporium** spp., general.

ROT, Culm. **Ophiobolus** sp., AR.

ROT, Leaf. **Phythiogeton autossytum**, OH; **Pythium helicoides**, OH.

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### Cats-Claw (*Doxantha*)

ROT, Root. **Phymatotrichum omnivorum**, TX.

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### Ceanothus

BACTERIAL Crown Gall. **Agrobacterium tumefaciens**, WA.

LEAF SPOT. **Cercospora ceanothi**, KS, WI; **Septoria ceanothi**, ID; **Cylindrosporium ceanothi**, Pacific Coast; **Phyllosticta ceanothi**, MS.

POWDERY MILDEW. **Microsphaera alni**, widespread.

ROT, Root. **Armillaria mellea**, CA.

ROT, Sapwood. **Schizophyllum commune**, CA.

RUST. **Puccinia tripsaci** (0, I), KS, NE, WI; II, III on grasses.

WILT. **Verticillium albo-atrum**, CA.

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### Cedar (*Cedrus* spp.) (Atlas Cedar, Deodar, Cedar of Lebanon)

CANKER; DIEBACK. **Diplodia pinea**, AL; **Sirococcus conigenus**, OR.

ROT, Heart. **Fomes pini**, occasional.

ROT, Root, **Armillaria mellea**, MS; **Clitocybe tabescens**, FL; **Phymatotrichum omnivorum** TX; **Phytophthora cinnamomi**, CA.

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### Celandine (*Chelidonium*)

LEAF SPOT. **Septoria chelidonii**, TX.

ROT, Root. **Phymatotrichum omnivorum**, TX.



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## Celery, Celeriac (*Apium graveolens*)

BACTERIAL Leaf Spot. *Pseudomonas jaggeri* pv. **apii**, CT, DE, FL, IN, MI, MN, ND, NY, OH; Leaf Blight, *P. cichorii*, FL; *Pseudomonas syringae* pv. **apii**, CA.

BACTERIAL, MLO. **California Aster Yellows**, CA, ID, UT, WA.

BACTERIAL Soft Rot. *Erwinia carotovora*, cosmopolitan.

BLIGHT, Early. *Cercospora apii*, general.

BLIGHT, Late. *Septoria apiicola* (includes *S. apii* large leaf spot, and *S. apii-graveolentis*), general.

DAMPING-OFF. *Pythium mastophorum*, CA; *Pythium* spp.; *Rhizoctonia solani*; *Aphanomyces euteiches*, cosmopolitan.

LEAF SPOT. *Phyllosticta apii*, DE, NJ; *Stemphylium* sp. and *Alternaria* sp., secondary.

NEMATODE, Awl. *Dolichodorus heterocephalus*, red root, FL.

NEMATODE, Pin. *Paratylenchus hamatus*, New England, CA; *P. projectus*, NJ.

NEMATODE, Root Knot. *Meloidogyne incognita*.

NEMATODE, Sheath. *Hemicycliophora parvana*, FL.

NEMATODE, Stem. *Ditylenchus dipsaci*, CA.

NEMATODE, Sting. *Belonolaimus gracilis*, FL; *B. longicaudatus*.

NEMATODE, Stubby Root. *Paratrichodorus christiei*.

NONPARASITIC. **Black Heart**. Wide fluctuations of soil moisture, general.

**Brown Stem**. Over-age plants.

**Cracked Stem**. Boron deficiency.

**Hollow Stem**. Pithiness. Sometimes chilling; sometimes genetic.

POWDERY MILDEW. *Erysiphe heraclei*, CA.

ROT, Gray Mold. *Botrytis cinerea*, cosmopolitan.

ROT, Petiole and Crown. *Sclerotinia minor*, CA.

ROT, Pink; Watery Soft. *Sclerotinia sclerotiorum*, general; *S. intermedia*; *S. minor*.

ROT, Root; Scab on celeriac. *Phoma apiicola*, CA, MI, NY, OH, WI.

ROT, Stem; Brown Spot. *Cephalosporium apii*, CA.

ROT, Storage. *Centrospora acerina*, NY; *Typhula variabilis*, NY; *Tricothecium roseum*, pink mold, NY.

SLIME MOLD. *Physarum* spp., CA.

VIRUS. **Celery Calico**, CA, FL, NY, OH; **Celery Mosaic**, AL, CA, FL, WA; **Cucumber Mosaic**; **Beet Curly Top**, OR; **Celery Yellow Spot**, CA; **Tomato Spotted Wilt**; **Lettuce Mosaic**, NY; **Broad Bean Wilt**, NY; **Apium Virus Y**, CA, WA; **Potyvirus**, CA.

WILT, Yellows. *Fusarium oxysporum* f. sp. **apii**, CA, MI, NY, TX, general.

WILT. *Verticillium albo-atrum*, CA.

In many areas soil treatment for nematodes increases yield. Yellows-resistant varieties are on the market. Seed should be treated for leaf blights unless more than 2 years old. In Florida, development of apothecia of *Sclerotinia* is inhibited by flooding fields. Western growers fight mosaic by celery-free periods and by controlling insect vectors.

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## Celtuce (*Lactuca serriota* var. *sativa*)

DOWNY MILDEW. *Bremia lactucae*, ND, PA, WA.

LEAF SPOT. *Septoria lactucae*.

ROT, Watery Soft; Drop. *Sclerotinia sclerotiorum*, MA.

Celtuce is a kind of lettuce and subject to some of the same diseases.

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## Cenchrus (Buffelgrass)

BLIGHT. *Pyricularia grisea*, TX.

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## Centaurea (Bachelors-Button, Basketflower, Cornflower, Dusty-miller, Yellow Starthistle)

BACTERIAL, MLO. **Aster Yellows**, widespread; **California Aster Yellows**, CA.

BLIGHT, Southern. *Sclerotium rolfsii*, CT, MD, NJ, TX.

CROWN GALL. *Agrobacterium rhizogenes*, OR.

DIEBACK, Stem. *Pseudomonas syringae*, MT.

DODDER. *Cuscuta* sp.

DOWNY MILDEW. *Bremia lactucae*, CA;  
*Plasmopara halstedii*, IA, TX.

NEMATODE, Root Knot. *Meloidogyne* sp., CA,  
FL, OH.

POWDERY MILDEW. *Golovinomyces*  
*cichoracearum*, CA, CT.

ROT, Root. *Phymatotrichum omnivorum*, TX;  
*Pythium* sp.; *Rhizoctonia solani*, IL, IN, NJ,  
NY, TX.

ROT, Stem. *Sclerotinia sclerotiorum*, CA,  
IN, MS, MO, TX; *Phytophthora cactorum*,  
NY.

RUST. *Puccinia cyani* (0, I, III), MA to NC, CA,  
IN, OR, WA; *P. irrequiseta* (II, III), TX; 0, I,  
unknown; *P. jaceae* var. *diffusa*; *P. acroptili*,  
NM; *P. jaceae* var. *solstitiales*, CA.

VIRUS. *Tomato Spotted Wilt*, PA.

WHITE RUST. *Albugo tragopogonis*, TX.

WILT. *Verticillium albo-atrum*, NY.

WILT, Stem Rot. *Fusarium oxysporum* f. sp.  
*callistephi*, MI.

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### Centipede Grass (*Eremochloa*)

ANTHRACNOSE. *Colletotrichum graminicola*, FL;  
*C. sublineola*, MS.

LEAF MOLD. *Curvularia* sp., LA; *Stachybotrys*  
sp., MD.

ROT, ROOT. *Gaeumannomyces graminis*, GA.

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### Century Plant (*Agave*)

ANTHRACNOSE. *Glomerella cingulata*  
(*Colletotrichum agaves*) occasional.

BLIGHT, Gray Mold. *Botrytis cinerea*, after  
chilling.

LEAF SCORCH; Blight. *Stagonospora gigantea*,  
NM, TX.

LEAF SPOT. *Coniothyrium concentricum*,  
*C. agaves*, common.

LEAF SPOT, Black Patch. *Dothidella parryi*, CA.

LEAF SPOT, Black Rot. *Thielaviopsis paradoxa*,  
Mexico.

LEAF SPOT, Red Leaf Ring. *Pantoea ananatis*,  
Mexico.

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### Cephalotaxus (Japanese Plum-Yew)

BLIGHT, Nursery. *Phomopsis juniperovora*, NY.

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### Cestrum

BACTERIAL Canker, Vascular. *Clavibacter*  
*michiganense*, WY.

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### Chaerophyllum

BROOMRAPE. *Orobanche ramosa*, TX.

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### Chamaecyparis (Atlantic White-Cedar, Port Orford White-Cedar, Alaska Yellow-Cedar, Hinoki Cypress, Sawara Cypress-Retinospora)

BACTERIAL Crown Gall. *Agrobacterium*  
*tumefaciens*, CA.

BLIGHT, Nursery. *Phomopsis juniperovora*,  
widespread.

BLIGHT, Tip. *Pestalotia funerea*, MI, NJ, TX;  
*Didymascella chamaecy-parissi*, NY.

CANKER, Bark Patch. *Aleurodiscus nivosus*, NJ.

NEMATODE. *Sphaeronema* sp., AK; *Crossonema*  
sp., AK.

NONPARASITIC. *Scorch*. Sun, freezing, drought,  
mites.

ROT, Collar and Root. *Phytophthora lateralis*,  
CA, OR, WA, serious; *P. cinnamomi*.

ROT, Heart. *Fomes pini*, occasional; *F. pinicola*,  
AK; *F. subroseus*, NJ, NC.

ROT, Root. *Armillaria mellea*, VA; *Clitocybe*  
*tabescens*, FL; *Phymatotrichum*  
*omnivorum*, TX; *Pythium ultimum*, CA;  
*Phytophthora lateralis*, CA.

ROT, Wood. *Lenzites saepiaria*, VA; *Poria* spp.;  
*Polyporus* spp.; *Steccherinum balloui*, NJ;  
*Trametes isabellina*, CA; *Fomes annosus*.

RUST, Gall. *Gymnosporangium biseptatum*  
(III), ME, NH to NJ, AL; 0, I on service-  
berry; *G. nootkatense* (III), AK, OR, WA;  
0, I on crabapple, pear, mountain-ash;

**G. fraternum** (III), ME, MA, NJ; 0, I on chokeberry.

RUST, Witches' Broom. **Gymnosporangium ellisii** (III), ME to FL and AL; 0, I on sweet fern, bayberry, wax-myrtle.

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### **Chamaedaphne (Cassandra, Leatherleaf)**

GALL, Leaf. **Exobasidium vaccinii**, widespread; **Synchytrium vaccinii**, NJ.

LEAF SPOT. **Ascochyta cassandrae**, NY to WI; **Venturia arctostaphyli**, NH, NY.

RUST. **Chrysomyxa ledi** var. **cassandrae** (II, III), ME to PA and MN; AK; 0, I on pine.

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### **Chayote (*Sechium*)**

ANTHRACNOSE. **Colletotrichum lagenarium**, FL, TX.

BLIGHT, Southern. **Sclerotium rolfsii**, TX.

LEAF SPOT. **Cercospora sechii**, FL, TX.

NEMATODE, Root Knot. **Meloidogyne** sp.; **M. incognita**.

NEMATODE, Stubby Root, **Trichodorus** sp.

POWDERY MILDEW. **Podosphaera xanthii**, LA.

ROT, Fruit. **Glomerella cingulata**, LA.

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### **Checker Mallow (*Sidalcea*)**

LEAF SPOT. **Ramularia sidalceae**, CA, CO, WY.

RUST. **Endophyllum tuberculatum** (III), CO, WY; **Puccinia interveniens** (0, I), CA, CO, ID, MT, OR, WA, WY; II, III on *Stipa*; **P. schedonnardi** (0, I), CO; **P. sherardiana** (0, III), AZ, CA, CO, NV, OR, WA.

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### **Chenopodium**

DAMPING-OFF. **Sclerotium rolfsii**, CA.

NEMATODE, Cyst. **Cactodera milleri**, WI.

VIRUS. **Sowbane Mosaic**, CA. Commonly used as test plant (bioassay) for viruses.

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### **Cherimoya, Custard-Apple (*Annona*)**

ANTHRACNOSE, Fruit Rot. **Glomerella cingulata**, FL.

BLIGHT, Stem. **Diplodia natalensis**, TX.

ROT, Root. **Armillaria mellea**, CA; **Clitocybe tabescens**, FL; **Phymatotrichum omnivorum**, TX.

RUST. **Phakopsora cherimoliae** (II, III), FL, TX.

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### **Cherry (*Prunus* spp.)**

BACTERIAL Black Spot; Canker; Gummosis. **Xanthomonas pruni**, NY to MI, GA and TX.

BACTERIAL Canker. **Pseudomonas syringae**, MA to MI; Pacific states and **P. morsprunorum**.

BACTERIAL Crown Gall. **Agrobacterium tumefaciens**, CA, TX, WA.

BACTERIAL Fire Blight. **Erwinia amylovora**, OR, WA.

BACTERIAL, MLO. **Peach X-Disease; Peach Yellow Leaf Roll (Peach Western X-Disease)**, Northwest.

BLACK KNOT. **Dibotryon morbosum**, eastern states.

BLIGHT, Blossom, Brown Rot. **Monilinia laxa**, general, Pacific states, MI, NY, WI; **Sclerotinia sclerotiorum**, OR.

BLIGHT, Seedling, Twig. **Monilinia rhododendri**, VT to GA, AR, IA; **M. fructicola**, shoot and leaf, GA.

BLIGHT, Shoot; Shot Hole. **Coryneum carpophilum** (*C. beijerinckii*), CA, ID, OR, WA; **Monilinia laxa**; MA, NY, RI.

CANKER, Felt Fungus. **Septobasidium retiforme**, GA.

CANKER, Trunk and Collar. **Phytophthora cactorum**, **P. citrophthora**, CA.

CANKER, Twig. **Phomopsis padina**; **Cytospora leucostoma**, NY, PA; **Valsa leucostoma**, widespread; **Nectria** sp., NY; **Eutypa lata** (syn. **E. armeniacae**), CA.

DIEBACK, Branch. **Calosphaeria pulchella**, CA.

LEAF BLISTER. **Taphrina farlowii**, VT to FL, TX; **Taphrina cerasi**, ME to NJ, MN.

LEAF SPOT. *Cercospora circumscissa* (*Mycosphaerella cerasella*), NJ, PA, VA to FL, TX; *Alternaria citri* var. *cerasi*, CA; *Phyllosticta pruni-avium*, OR; *Cercospora graphioides* and *Phyllosticta serotina* on wild black cherry only; *Coccomyces lutescens*, VA.

LEAF SPOT; Blight; Shot hole. *Coccomyces hiemalis*, general.

MISTLETOE. *Phoradendron serotinum* (*flavescens*).

NEMATODE, Lesion. *Pratylenchus* sp.; *P. vulnus*, CA.

NEMATODE, Root Knot. *Meloidogyne* sp.; *M. incognita*; *M. javanica*.

NONPARASITIC. **Brown Bark Spot.** Arsenical poisoning of soil, ID, MT, WA. **Chlorosis.** Alkali injury, CA, TX. **Little Leaf.** Zinc deficiency, CA, OR, WA.

POWDERY MILDEW. *Podosphaera oxyacanthae*, general.

ROT, Brown. *Monilinia fructicola*, general; *M. laxa*, MA, NY, RI, Argentina.

ROT, Fruit. *Alternaria* sp.; *Botrytis cinerea*; *Cladosporium herbarum*, CA to WA and ID; *Lambertella* sp., OR; *Microstroma tonellianum*, MA; *Penicillium expansum*; *Rhizopus stolonifer*, occasional in market; *Pullularia* sp., Northwest; *Mucor piriformis*.

ROT, Green Fruit. *Sclerotinia sclerotiorum*, OR.

ROT, Heart; Wood. *Fomes fomentarius*, Northeast; *Polyporus* spp.; *Poria ambigua*, CA.

ROT, Root. *Armillaria mellea*, NM, OK, OR; *Phymatotrichum omnivorum*, TX; *Xylaria* spp., VA; *Poria ambigua*, CA.

ROT, Silver Leaf. *Stereum purpureum*, NY, MT.

RUST. *Tranzschelia discolor* (II, III), GA, MA, NE, NY, NC, OK, TX; 0, I on anemone.

SCAB. *Fusicladium cerasi*, NY to IA and WI.

VIRUS. **Cherry Rough Fruit**, UT on sweet cherry (*Prunus avium*); **Cherry Albino**; **Cherry Bark-Splitting**; **Cherry Black Canker**; **Cherry Buckskin**; **Cherry Bud Abortion**; **Cherry Chlorosis**; **Cherry Freckle Fruit Disease**; **Cherry Green Ring Mottle**; **Cherry Gummosis**; **Cherry Little Cherry**; **Cherry Midleaf Necrosis**; **Cherry Mora**;

**Cherry Mottle Leaf**; **Cherry Necrotic Rusty Mottle**; **Cherry Pink Fruit**; **Cherry Pinto Leaf**; **Cherry Rasp Leaf**; **Cherry Ring Spot**; **Cherry Rugose Mosaic**; **Cherry Rusty Mottle**; **Cherry Twisted Leaf**; **Cherry Vein Clearing**; **Cherry Yellows**; **Prune Dwarf**; **Tomato Ring Spot**; **Stem Pitting**; **Prunus Necrotic Ring Spot**, CA, WA; **Plum Pox**, WA.

VIRUS, Leafroll and Yellow Leaves. *Nepovirus*, WA.

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### Cherry, Flowering, Oriental (*Prunus serrulata*)

BACTERIAL Fire Blight. *Erwinia amylovora*, GA, OH.

BACTERIAL Leaf Spot. *Xanthomonas pruni*, NJ.

CANKER; DIEBACK. *Botryosphaeria ribis*, GA.

DECLINE. Cause, unknown; complex of insect, poor soil, viral infection and air pollutants suspected, VA.

LEAF BLISTER; Witches' Broom. *Taphrina cerasi*, MD, NJ.

LEAF SPOT. *Coccomyces hiemalis*, MA, NJ.

SCAB. *Cladosporium carpophilum*, MS.

VIRUS. **Cherry Vein Clearing**; **Cherry (Flowering) Rough Bark**; **Cherry Little Cherry**.

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### Cherry, Japanese Flowering (*Prunus subhirtella*)

LEAF SPOT. *Cristulariella pyramidalis*, FL.

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### Cherry-Laurel (*Prunus laurocerasus*)

BACTERIAL Spot. *Xanthomonas pruni*, GA, MS, NJ, SC.

BLIGHT, Blossom; Brown Rot. *Monilinia fructicola*, CA; *M. laxa*, CA; *Alternaria* sp., TX.

LEAF SPOT. *Cercospora circumscissa*, CA; *C. cladosporioides*, LA, TX; *Coccomyces lutescens*, MS; *Phyllachora beaumontii*,

AL; **Phyllosticta laurocerasi**, CA, FL, NJ; **Septoria ravenelii**, SC.

MISTLETOE. **Phoradendron serotinum (flavescens)**, FL.

ROT, Root. **Armillaria mellea**, CA; **Clitocybe tabescens**, FL; **Phymatotrichum omnivorum**, TX.

WILT. **Verticillium albo-atrum**, CA.

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## Chestnut (*Castanea*)

BLIGHT, Canker. **Endothia parasitica**, general, with American chestnut practically exterminated by it.

BLIGHT, Twig. **Cytospora** sp.; **Phomopsis** sp.; **Diplodia longispora**.

CANKER, Bark Patch. **Aleurodiscus aceris**.

CANKER; DIEBACK. **Cryptodiaporthe castanea**; **Strumella coryneoidea**.

LEAF SPOT. **Actinopelte dryina**; **Cylindrosporium castaneae**; **Marssonina ochroleuca**, general; **Monochaetia desmazierii**; **M. kansensis**; **Phyllosticta castanea**; **Exosporium fawcettii**; **Scolecosporium fagi**.

MISTLETOE. **Phoradendron villosum**, CA.

POWDERY MILDEW. **Microsphaera alni**; **Phyllactinia corylea**.

ROT, Root. **Armillaria mellea**; **Phytophthora cinnamomi**; **Phymatotrichum omnivorum**.

ROT, Wood. **Fomes** spp.; **Polyporus** spp.; **Poria** spp.; **Stereum** spp.

Japanese and Chinese chestnuts are resistant to chestnut blight. Plant breeders are trying to develop hybrids between Asiatic and native species that will be resistant to *Endothia*.

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## Chickory

► Endive.

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## Chick-Pea, Garbanzo (*Cicer*)

BACTERIAL, Blight. **Pseudomonas andropogonis**, ME.

BACTERIAL, Pink Seed. **Erwinia rhapontici**, Saskatchewan, Canada.

BLIGHT. **Ascochyta radiei**, ID, NE, WA.

NEMATODE, Root Knot. **Meloidogyne** spp.

POWDERY MILDEW. **Leveillula taurica**, WA.

ROT, Root. **Fusarium solani** f. sp. **pisi**; **Thielaviopsis basicola**, ID, WA.

ROT, Root; Damping-Off. **Pythium ultimum**, CA; **Rhizoctonia solani**, CA.

ROT, Stem. **Sclerotinia sclerotiorum**, ND, WA; **S. minor**, AR.

RUST. **Uromyces ciceris-arietini**, CA, GA.

VIRUS. **Mosaic**, unidentified, CA; **Chickpea filiform**, WA; **Lettuce Mosaic**, CA; **Red Clover Vein Mosaic**, WA; **Pea Enation Mosaic**, ID, WA; **Bean leaf Roll**, ID, WA; **Pea Streak**, ID, WA.

WILT. **Fusarium lateritium** f. sp. **cicerii**; **Vascular Disease**; **Phialophora gregata**; **Fusarium solani** f. sp. **pisi**, CA. **Verticillium albo-atrum**.

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## Chickweed (*Stellaria* and *Cerastium*)

ROT. **Sclerotinia minor**, NC; **Sclerotium rolfsii** (stem), NC.

RUST, Broom. **Melampsorella caryophyllacearum**, NY.

VIRUS. **Tomato Ringspot**, PA; **Tomato Spotted Wilt**, GA.

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## Chinaberry (*Melia*)

BLACK MILDEW. **Meliola** sp.

BLACKLEG. **Phoma lingam**, WA.

BLIGHT, Limb; Twig. **Pellicularia koleroga**, FL; **Eutypella stellulata**, OK, TX; **Fusarium lateritium**, TX.

CANKER. **Nectria coccinea**, MS, SC.

DOWNY MILDEW. **Peronospora parasitica**, general.

LEAF SPOT. **Cercospora leucosticta**, Gulf states; **C. meliae**; **C. subsessilis**; **Phyllosticta azedarachis**, AL; **P. meliae**, LA, TX.

MISTLETOE. **Phoradendron serotinum (flavescens)**, TX.

NEMATODE, Root Knot. **Meloidogyne** sp.  
 PHYTOPLASMA; Witches' Broom and Decline, Brazil, Rio Grande do Sul.  
 POWDERY MILDEW. **Phyllactinia corylea**, MS.  
 ROT, Root. **Helicobasidium purpureum**, TX;  
**Phymatotrichum omnivorum**, AZ, TX.  
 ROT, Wood. **Fomes meliae**, AL; **Polyporus versicolor**, GA.

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### Chinese Cabbage (*Brassica pekinensis*, *B. chinensis*)

ANTHRACNOSE. **Colletotrichum higginsianum**, FL.  
 BACTERIAL Black Rot. **Xanthomonas campestris**, IN, MD, TX.  
 BACTERIAL Leaf Spot. **Pseudomonas maculicola**, VA.  
 BACTERIAL, MLO. **Aster Yellows**.  
 BLIGHT, Southern. **Sclerotium rolfsii**, TX.  
 CLUB ROOT. **Plasmodiophora brassicae**, CT, MA, NJ, OH, PA.  
 LEAF SPOT, Black. **Alternaria oleracea**, CA, CT, FL, MA, NH, TX; Gray, **A. brassicae**, CA, CT, FL, IN, MD; **Cercospora brassicola**, FL, GA, NH, NJ; **Cercospora brassicae**, white spot, widespread.  
 LEAF SPOT; White Spot. **Pseudocercospora capsellae**, CA.  
 NEMATODE, Root Knot. **Meloidogyne** sp.  
 POWDERY MILDEW. **Erysiphe polygoni**, AZ, MA; **Peronospora parasitica**.  
 ROT, Root; Damping-off. **Aphanomyces raphani**, WI.  
 ROT, Watery Soft. **Sclerotinia sclerotiorum**, AZ, MA, NY, TX.  
 VIRUS. **Turnip Mosaic**; **Cauliflower Mosaic**.  
 WHITE RUST. **Albugo candida**, AL.

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### Chinese Evergreen (*Aglaonema*)

ANTHRACNOSE. **Colletotrichum** sp., **Gloeosporium** sp., WA.  
 BACTERIAL Leaf Spot. **Erwinia aroideae**; **Xanthomonas dieffenbachiae**, FL.

GLEBAL MASSES. **Sphaerobolus stellatus** (**Gasteromycetous fungus**), FL, TX.  
 LEAF SPOT. **Myrothecium roridum**, FL; **Burkholderia gladioli**, Argentina.  
 NEMATODE, LESION. **Pratylenchus coffeae**, FL.  
 NEMATODE, Root Knot. **Meloidogyne javanica**.  
 ROT, Collar; Foliar Blight. **Fusarium subglutinans**, HI.  
 ROT, Root; Leaf. **Pythium splendens**, FL.

The root rot is serious, with all roots rotted, plants stunted, dying. Destroy infected plants. Take tip cuttings well above ground.

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### Chinese Lantern (*Physalis alkekengi*)

LEAF SPOT. **Alternaria solani**; **Phyllosticta** sp., OK; **P. physaleos**, CT.  
 SMUT, White. **Entylooma australe**, CT, NY.  
 VIRUS. **Cucumber Mosaic**; **Tobacco Mosaic**; **Potato Mottle**.  
 WILT. **Verticillium albo-atrum**, NY.

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### Chinese Tallowtree (*Sapium*)

LEAF SPOT. **Cercospora stillingiae**, LA; **Phyllosticta stillingiae**, LA.  
 ROT, Root. **Clitocybe tabescens**, FL; **Phymatotrichum omnivorum**, TX.

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### Chinese Waxgourd (*Benincasa*)

ANTHRACNOSE. **Colletotrichum lagenarium**, IN.  
 DOWNY MILDEW. **Pseudoperonospora cubensis**, MA, OH.  
 NEMATODE, Root Knot. **Meloidogyne** sp.

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### Chinquapin (*Castanopsis*)

BLIGHT, Chestnut; Canker. **Endothia parasitica**, general.  
 CANKER, BROWN Felt. **Septobasidium pseudopedicellatum**.  
 LEAF BLISTER. **Taphrina castanopsidis**, CA.

LEAF SPOT. *Dothidella castanopsidis*, CA, OR;  
*Mycosphaerella* sp., CA, OR.  
 POWDERY MILDEW. *Microsphaera alni*, NC.  
 ROT, Heart; Sapwood; Wood. *Fomes ignarius*,  
 OR; *Ganoderma oregonenses*; *Peniophora*  
*sanguinea*; *Polyporus hirsutus*; *P. versicolor*.  
 ROT, Root. *Armillaria mellea*, OR.  
 WILT, Oak. *Ceratocystis fagacearum*.

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### Chiogenes (Creeping Snowberry)

RUST. *Chrysomyxa chiogenis* (II, III), MI, NH,  
 NY, WI; 0, I unknown.

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### Chionodoxa (Glory-of-the-Snow)

NEMATODE, Bulb. *Ditylenchus dipsaci*.

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### Chirita

VIRUS. **Tobacco Mosaic**, CA, CT, DC, FL, OH,  
 WA.

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### Chives (*Allium schoenoprasum*)

BLIGHT, Leaf. *Botrytis byssoidea*, CA.  
 DOWNY MILDEW. *Peronospora destructor*, CA.  
 RUST. *Puccinia porri* (II, III), CT, NY, WA.  
 SMUT. *Urocystis cepulae*, MA.

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### Chlorogalum (Soap-Plant)

LEAF SPOT. *Heterosporium gracile*, CA.  
 RUST. *Uromyces aureus* (0, I, III), CA.

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### Chokeberry (*Aronia*)

BACTERIAL Fire Blight. *Erwinia amylovora*, MI,  
 TX, WV.  
 DODDER. *Cuscuta compacta*, FL.  
 LEAF SPOT. *Ascochyta pirina*, WI; *Cercospora*  
*mali*, AL, TX; *C. piri*, MI, NH, WI;

*Mycosphaerella arbutifolia*, NY;  
*Phyllosticta arbutifolia*, NJ.  
 ROT, BROWN. *Monilinia fructicola*, WI.  
 ROT, Root. *Phymatotrichum omnivorum*, TX.  
 RUST. *Gymnosporangium clavariiforme* (0, I),  
 MA; III on juniper; *G. clavipes* (0, I), CT, ME,  
 MA, TX; *G. davisii* (0, I), ME, MI, NH, WI;  
*G. fraternum* (0, I), DE, MA, ME, NJ, PA; III  
 on chamaecyparis.

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### Chokecherry (*Prunus virginiana*)

BACTERIAL Leaf Spot. *Xanthomonas pruni*, IL,  
 MT, NY, WY.  
 BACTERIAL, MLO. **Peach X-Disease**, NH to VA,  
 IL, WI.  
 BLACK KNOT. *Dibotryon morbosum*, general.  
 BLIGHT, Fruit and Shoot. *Monilinia demissa*, ID,  
 WA; *M. padi* (*Sclerotinia angustior*), VT to  
 KS, ND.  
 CANKER; DIEBACK. *Cytospora chrysosperma*, MT.  
 CANKER, TWIG. *Eutypa lata* (syn. *E.*  
*armeniaca*), CA.  
 LEAF BLISTER; Fruit, Shoot Hypertrophy.  
*Taphrina confusa*, widespread.  
 LEAF SPOT. *Cylindrosporium nuttallii*, OR;  
*Gloeosporium prunicola*, NY;  
*Lophodermina prunicola*, tar spot, CO;  
*Mycosphaerella cerasella*, KS; *Phyllosticta*  
*circumscissa*; *P. virginiana*, leaf blotch, NY  
 to KS and MT; *Septoria pruni*, MI.  
 LEAF SPOT; Shot Hole. *Cercospora*  
*circumscissa*, New England, IA, WI; ND  
 to KS, and MT; *Cercospora lutescens*,  
 general.  
 NEMATODE, Root Knot. *Meloidogyne* sp.  
 POWDERY MILDEW. *Podosphaera oxyacanthae*,  
 widespread; *Phyllactinia corylea*, WA.  
 ROT, Brown Heart. *Fomes fulvus*, ND, SD.  
 RUST. *Tranzschelia pruni-spinosae* (II, III), CT  
 to IL, WI.  
 VIRUS. **Western X-Disease**, ID, OR, UT, WA;  
**Tatter Leaf (Peach Ring Spot)**.  
 Chokecherries should be eliminated  
 near peach orchards to control the peach  
 X-disease.

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### Christmas Berry (*Heteromeles arbutifolia*)

BLIGHT, Sudden Oak Death. *Phytophthora ramorum*, CA.

RUST. *Gymnosporium exiguum*, CA.

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### Christmas Cactus (*Zygocactus truncatus*)

ROT, Basal Stem. *Fusarium oxysporum*, MA.

ROT, Root. *Phytophthora parasitica*, FL.

VIRUS. *Zygocactus Montana X*, MT.

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### Christmas Rose (*Helleborus niger*)

BLIGHT, Flower Spot. *Botrytis cinerea*, NJ; *Gloeosporium* sp., NJ.

LEAF SPOT, Black. *Coniothyrium hellebori*, MD, NY, OR.

ROT, Stem. *Sclerotium delphinii* (*S. rolfsii*), NY.

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### Chrysanthemum (*Dendranthema grandiflora*)

BACTERIAL, MLO. Phloem Necrosis. MLO, widespread; Aster Yellows.

BACTERIAL Blight; Wilt. *Erwinia chrysanthemi*, serious in greenhouses; *E. carotovora*, OK; *Pseudomonas cichorii*, FL.

BACTERIAL Crown Gall. *Agrobacterium tumefaciens*, CT, FL, NJ, TX.

BACTERIAL Fasciation. *Clavibacter fascians*, MI, NJ, NY, OH.

BLIGHT, Blossom. *Phytophthora nicotianae*, AL.

BLIGHT, Gray Mold. *Botrytis cinerea*, cosmopolitan.

BLIGHT, Leaf; Blotch. *Septoria leucanthemi*, widespread.

BLIGHT, Petal. *Itersonilia perplexans*, FL, MN.

BLIGHT, Ray. *Ascochyta chrysanthemi* (*Mycosphaerella ligulicola*), MD to FL, CA, MS, OH; Ray Speck, *Stemphylium floridanum*, FL; *Alternaria* spp.

BLIGHT, Southern. *Sclerotium rolfsii*, FL, VA.

DODDER. *Cuscuta* sp., MI, NJ, NY, WA, WV; *C. arvensis* and *C. indecora*, TX.

LEAF SPOT. *Alternaria* sp., OK, TX; *Cercospora chrysanthemi*, AL, LA, MD, PA, TX; *Cylindrosporium chrysanthemi*, MA to AL and KS; *Phyllosticta chrysanthemi*, FL, MA, MS, VA; *Septoria chrysanthemella* (*S. chrysanthemi*) and *S. obesa*, general.

NEMATODE, Leaf. *Aphelenchoides ritzemabosi*, widespread.

NEMATODE, LESION. *Pratylenchus pratensis*, NJ, TX.

NEMATODE, Root Knot. *Meloidogyne* spp.

NONPARASITIC. Crackneck. In greenhouses, probably overwatering and insufficient ventilation.

Air Pollution Injury.

Yellow Strapleaf. Amino acid imbalance.

PETAL SPOT. *Bipolaris* (*Helminthosporium*) *setariae*, FL.

POWDERY MILDEW. *Golovinomyces cichoracearum*, general.

ROT, Charcoal Stem. *Macrophomina phaseoli*, OK.

ROT, Flower. *Fusarium tricinctum* f. sp. *poae*, LA, NJ.

ROT, Root. *Fusarium* sp.; *Rhizoctonia solani*, general; *Pythium* sp.; *Phymatotrichum omnivorum*, AZ, TX.

ROT, Stem. *Fusarium solani*.

ROT, Stem; Drop. *Sclerotinia sclerotiorum*, AZ, LA, MI, VA.

RUST. *Puccinia taneceti* (II), general.

VIROID. Chrysanthemum Stunt, serious; Chrysanthemum Chlorotic Mottle, FL, NY, widespread.

VIRUS. Chrysanthemum Flower Distortion; Chrysanthemum Mosaic; Chrysanthemum Ring Spot; Chrysanthemum Rosette; *Impatiens* Necrotic Spot, GA, NC; Tomato Aspermy; Tomato Spotted Wilt.

WHITE RUST. *Puccinia horiana* (III, IV), CA, FL, NJ, OR, PA.

WILT. *Fusarium oxysporum* f. sp. *callistephi*; *F. oxysporum* f. sp. *tracheiphilum*, SC; *F. oxysporum* f. sp. *chrysanthemi*, FL, SC, widespread; *Verticillium albo-atrum*.



When garden chrysanthemums have foliage browning and dying progressively up the stem, the cause can be leaf nematodes, Septoria leaf spots, or Verticillium wilt. To reduce spread of nematodes home gardeners should take tip cuttings rather than crown divisions. Commercial growers should procure stock free from stunt and other virus diseases.

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### Chrysopsis (Golden Aster)

LEAF SPOT. *Cercospora macroguttata*, AL, MS; *Ramularia chrysopsidis*, NY.

POWDERY MILDEW. *Golovinomyces cichoracearum*, MT, WY.

RUST. *Coleosporium asterum* (II, III), CO, FL, NE; 0, I on pine; *Puccinia grindeliae* (III), CA, CO, OK, UT, WY; *P. stipae* (0, I), AZ, CO, FL, MT, NE, WY; II, III on grasses.

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### Cimicifuga (Bugbane, Black Cohosh)

LEAF SPOT. *Ascochyta actaeae*, CT, NY; *Ectostroma afflatum*, VA.

NEMATODE, Root Knot. *Meloidogyne* spp., NJ.

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### Cinchona

LEAF SPOT. *Cercospora cinchonae*, LA.

NEMATODE, Root Knot. *Meloidogyne* sp.

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### Cineraria (*Senecio*)

BACTERIAL, MLO. Aster Yellows, NY.

BLIGHT. *Botrytis cinerea*, AK, IN, MO, NJ, PA.

DAMPING-OFF. *Rhizoctonia solani*, IL, NY.

DOWNY MILDEW. *Plasmopara halstedii*, NY.

NEMATODE, Root Knot. *Meloidogyne* sp.

POWDERY MILDEW. *Golovinomyces cichoracearum*, MA.

ROT, Root. *Pythium* sp., MD; *P. ultimum*; *Thielaviopsis basicola*, MA.

ROT, Stem. *Fusarium* sp., PA; *Phytophthora* sp., NJ; *Sclerotinia sclerotiorum*, WA.

RUST. *Puccinia lagenophorae*, NY.

VIRUS. *Cineraria Mosaic*, WA; **Tomato Spotted Wilt; Chrysanthemum Stunt** (viroid); **Impatiens Necrotic Spot**, NC.

WILT. *Verticillium albo-atrum*, NJ, NY, WA; *V. dahliae*, CA.

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### Cinnamon-Tree (*Cinnamomum zeylandicum*)

ANTHRACNOSE. *Glomerella cingulata*, FL.

LEAF SPOT, Algal. *Cephaleuros virescens*, FL.

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### Cirsium (Plumed Thistle)

LEAF SPOT. *Alternaria chrysanthemi*, MT; *Cercospora* spp.; *Phyllosticta cirsii*; *Septoria cirsii*, WI.

POWDERY MILDEW. *Golovinomyces cichoracearum*, general; *Sphaerotheca macularis*.

ROT, Root. *Rhizoctonia solani*, IL; *Phymatotrichum omnivorum*, TX.

RUST. *Puccinia cirsii* (0, I, II, III), PA to NC, CA, TX, OR; *Uromyces junci* (0, I), MT, NE, ND. SMUT, Inflorescence. CO, UT.

WHITE RUST. *Albugo tragopogonis*, NY to IA, TX, WY.

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### Cissus

LEAF SPOT. *Cercospora viticola*, LA; *C. arboreae*, TX; *Phyllosticta cissicola*, TX.

ROT, Root. *Phymatotrichum omnivorum*, TX.

RUST. *Aecidium mexicanum* (0, I), OK.

SMUT. *Mycosyrinx cissi*, FL.

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### Citrus Fruits (Grapefruit, Lemon, Lime, Orange)

ANTHRACNOSE; Withertip, Fruit Spot. *Glomerella cingulata*, general.

ANTHRACNOSE, Lime; Withertip. *Gloeosporium limetticolum*, on lime only, CA.

- ANTHRACNOSE, Scab. **Elsinoë australis**, FL.
- BACTERIAL Blast; Blight; Black Pit. **Pseudomonas syringae**, CA; after cold rains.
- BACTERIAL Brown Leaf Spot. **Burkholderia andropogonis**, FL.
- BACTERIAL Canker. **Xanthomonas campestris** pv. **citri**, FL.
- BACTERIAL Crown Gall. **Agrobacterium tumefaciens**, AZ, CA.
- BACTERIAL Greening. **Candidatus Liberibacter asiaticus**, Central America, Puerto Rico.
- BACTERIAL, MLO. **Citrus Stubborn Disease**.
- BLIGHT, Brown Spot; Fruit and Young Shoots. **Alternaria citri**, FL.
- BLIGHT, Leaf and Stem. **Phytophthora syringae**, CA.
- BLIGHT, Seedling; Fruit Rot. **Sclerotium rolfsii**.
- BLIGHT, Thread. **Pellicularia koleroga**, Gulf states.
- BLIGHT, Twig. **Gibberella baccata** (*Fusarium lateritium*), CA; **Tryblidiella rufula**, TX.
- BLOTCH, Sooty. **Gloeodes pomigena**, Gulf states.
- CANKER, Branch. **Eutypella** spp., CA; **Spencermartinsia viticola**, **Neofusicoccum austral**, and **N. parvum**, CA.
- CANKER, Branch Knot. **Sphaeropsis tumefaciens**, FL.
- CANKER, Branch Wilt. **Exosporina fawcettii**, CA.
- CANKER; DIEBACK. **Aspergillus foetidus**, CA.
- CANKER, Felt Fungus. **Septobasidium** spp., Gulf states.
- CANKER, Trunk. **Botryodiplodia theobromea**, TX.
- CANKER, Wound. **Hendersonula toruloidea**, CA.
- DAMPING-OFF. **Pythium** spp.; **Rhizoctonia solani**, cosmopolitan.
- DODDER. **Cuscuta americana**, CA, FL; **Cassytha filiformis**, a dodderlike plant, FL.
- GREENING DISEASE. **Huanglongbing**, FL.
- LEAF SPOT. **Cercospora aurantia**, FL, TX; Greasy Spot, **C. citri-grisea**, FL; Tar Spot, **C. gigantea**, FL; **Cladosporium oxysporum**, FL; **Mycosphaerella lageniformis**, CA; **M. citri**, FL; **Pleospora** sp., CA; **Alternaria citri**, on Rangpur lime; Fruit Spot, **Septoria citri**, CA, TX; **S. limonium**, CA; **Xanthomonas fuscans**, Brazil.
- LEAF SPOT, Algal; Red Rust. **Cephaleuros virescens**, Gulf states.
- MISTLETOE. **Phoradendron** sp., Gulf states.
- NEMATODE, Burrowing. **Radopholus similis**, FL.
- NEMATODE, Citrus. **Tylenchus semipenetrans**, CA, FL.
- NEMATODE, Lance. **Hoplolaimus coronatus**.
- NEMATODE, Lesion. **Pratylenchus brachyurus**; **P. vulnus**.
- NEMATODE, Ring. **Criconema civellae**; **Criconemoides citri**, FL.
- NEMATODE, Stubby Root. **Paratrichodorus christiei**.
- NONPARASITIC. **Blight**. Boron deficiency, CA, FL. **Bronzing**. Magnesium deficiency, FL. **Cancroid Spot**. Genetic abnormality. **Chlorosis**. Iron deficiency, AZ, CA, FL; manganese deficiency, FL.
- Exanthema**. Copper deficiency, augmented by excessive nitrogen fertilization and bad drainage, CA, FL.
- Greasy Spot**. Black Melanose, Cause unknown, CA, TX; chiefly grapefruit.
- Gummosis**. Gum Spot; Gummosis. Environmental injuries in part.
- Leprosis**. Florida Scaly Bark; Nailhead Rust. Cause unknown, FL.
- Mottle Leaf**. Zinc deficiency, AZ, CA, FL.
- Oleocellosis**. Rind-oil Spot. Chemical injury from release of oil in rind.
- Rumple**. Rind network on lemon; cause unknown.
- Silver Scurf**. Thrips injury on fruit, widespread; Silvering. Rust mite injury; Stigmonose. Insect punctures.
- Wilt; Blight; Leaf Curl**. Irregular water supply, FL.
- PHYTOPLASMA, Citrus Huanglongbing. **Candidatus L. asiaticus**, FL.
- POWDERY MILDEW. **Oidium** sp., CA, FL; **O. tingitaninum**.
- ROT. **Diplodia**; Collar; Twig Blight. **Diplodia natalensis**, general.
- ROT, Black, of Fruit. **Alternaria citri**, widespread.
- ROT, Brown; Gummosis. **Phytophthora citrophthora**, AZ, CA, FL; **P. parasitica**, "mal di gomma," CA, FL.

ROT, Charcoal. **Macrophomina phaseoli**, AZ, CA.

ROT, Cottony Fruit; Twig Blight. **Sclerotinia sclerotiorum**, CA, FL, TX.

ROT, Dothiorella; Bark Canker. **Botryosphaeria ribis**, widespread.

ROT, Fruit. **Aspergillus** spp.; **Fusarium** spp.; **Mucor** spp.; **Oospora citri aurantii**, sour rot, **Nematospora coryli**, dry rot; **Candida krusei**; **Gloeosporium foliicolum** (*Glomerella cingulata*), FL; **Penicillium italicum**, Mexico.

ROT, Gray Mold; Twig Blight. **Botrytis cinerea**, CA.

ROT, Green Mold. **Penicillium digitatum**; Blue Mold, CA; **P. italicum**; Pink Mold, **P. roseum**, cosmopolitan; Black Mold, **Rhizopus stolonifer**; **Trichothecium viride**, occasional.

ROT, Melanose; Phomopsis; Decorticosis; Shell Bark. **Diaporthe citri**, general.

ROT, Mushroom Root. **Armillaria mellea**, CA; **Clitocybe tabescens**, FL.

ROT, Root. **Fusarium solani**; **Phymatotrichum omnivorum**, TX; **Poria vaporaria**, CA; **Thielaviopsis basicola**.

ROT, Sour. **Geotrichum citri-aurantii**, Mexico.

ROT, Wood. **Daldinia concentrica**, occasional; **Ganoderma lucidum**, FL; **Polyporus** spp.; **Schizophyllum commune**; **Trametes hydroides**; **T. hispida**.

SOOTY MOLD, **Capnodium citri**; **C. citricola**. Gulf states.

SPOT ANTHRACNOSE; Citrus Scab. **Elsinoë fawcettii**, AL, CA, FL, LA, MS.

VIRUS. **Algerian Navel Orange**, FL; **Citrus Ringspot**, CA, FL; **Citrus Exocortis** (viroid); **Citrus Psorosis**, Scaly Bark; **Citrus Tatter Leaf**; **Citrus Tristeza**, Quick Decline; **Citrus Vein Enation**; **Citrus Xyloporosis**, Cachexia; **Citrus Yellow Vein**; **Citrus Leaf Rugose**, CA; **Citrus Tristeza**, LA; **Citrus Variegation**; **Citrus Leprosis**; **Citrus Enation-Woody Gall**, CA.

In the home garden oil sprays for scale help to get rid of sooty mold. A neutral copper spray just before growth starts is recommended in Florida for citrus scab and one just after

flowering for melanose. Citrus trees in the burrowing nematode area are being pulled and the soil treated. Consult the California and Florida Agricultural Experiment Stations for the latest information on specific Citrus problems.

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## Clarkia

ANTHRACNOSE, **Colletotrichum** sp., PA.

BACTERIAL, MLO. **Aster Yellows**, NY, and **California Aster Yellows**, CA.

BLIGHT, Gray Mold; Canker. **Botrytis cinerea**, CA, NY.

DAMPING-OFF. **Pythium debaryanum**, CA; **Rhizoctonia solani**, CT.

DOWNY MILDEW. **Peronospora arthuri**, CA.

GALL, Leaf. **Synchytrium fulgens**, CA.

LEAF SPOT. **Alternaria tenuis**, secondary.

ROT, Stem. **Fusarium** sp., CA; **Phytophthora cactorum**, NY.

RUST. **Puccinia oenotherae** (0, I, II, III), CA, ID, NV, OR, WA; **Puccini astrum pustulatum** (II, III), AK, NY.

WILT. **Verticillium albo-atrum**, CA.

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## Clausena (Wampi)

LEAF SPOT. **Glomerella cingulata**, MD.

NEMATODE, Citrus. **Tylenchulus semipenetrans**, FL.

SPOT ANTHRACNOSE; Citrus Scab. **Elsinoë fawcettii**, FL.

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## Claytonia (Spring Beauty)

DOWNY MILDEW. **Peronospora claytoniae**, CA, IA, MD, TX, WA.

GALL, Leaf. **Physoderma claytoniana**, MI, WI.

LEAF SPOT. **Ramularia claytoniae**, CA.

ROT, Root. **Phymatotrichum omnivorum**, TX.

RUST. **Puccinia marie-wilsoniae** (0, I, III), NH to VA, CO, MO, UT, WA, WI; **P. agnita** (0, III); **Uromyces claytoniae** (0, I, III), NY.

VIRUS. **Spring Beauty Latent**, AR.

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### Clematis (including Virgins-Bower)

BACTERIAL Crown Gall. *Agrobacterium tumefaciens*, MN, TX.

BLIGHT, Leaf. *Phloeospora adusta*, TX.

LEAF SPOT. *Ascochyta clematidina*, widespread; *Cercospora rubigo*, CA, WA; *C. squalidula*, widespread; *Cylindrosporium clematidis*, East and South; *Glomerella cingulata*, FL; *Phyllosticta clematidis*, MT, VA; *Ramularia clematidis*, MT; *Septoria clematidis*, WA, WI; *Sphaerella applanata*, MT, TX.

NEMATODE, Root Knot. *Meloidogyne hapla*, ND.

POWDERY MILDEW. *Erysiphe polygoni*, widespread.

RUST. *Puccinia recondita* (0, I), Rocky Mts. and Pacific Coast; II, III on grasses; *P. pulsatillae* (III), CA; *P. stromatica* (III), AL; *Tranzschelia viornae* (II, III), TX.

SMUT. *Urocystis carcinodes*, UT.

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### Cleome (Spider-Flower)

DOWNY MILDEW. *Peronospora parasitica*, LA.

LEAF SPOT. *Cercospora cleomis*, MI, NJ; *C. conspicua*; *Heterosporium hybridum*, IA, MT.

NEMATODE, Root Knot. *Meloidogyne* sp.

POWDERY MILDEW. *Leveillula taurica*, North America.

RUST. *Puccinia aristidae* (0, I), AZ, CO, IN, MT, NE, NM; II, III on grasses.

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### Clerodendrum (Glorybower)

CANKER, Stem. *Kutilakesa pironii*, FL.

LEAF SPOT. *Septoria phyletaenioides*, SC; *Cercospora apii* f. sp. *clerodendri*, FL.

NEMATODE, Root Knot. *Meloidogyne* sp., MD.

VIRUS. *Zonate Ring Spot*, FL.

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### Clethra (Sweet Pepperbush, White-Alder)

GALL, Red Leaf. *Synchytrium vaccinii*, NJ.

LEAF SPOT. *Phyllosticta clethricola*, MD, NJ, TX.

ROT, Root. *Corticium galactinum*.

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### Clinopodium (Basil-Weed)

LEAF SPOT. *Phyllosticta deciduas*, NY.

RUST. *Puccinia menthae* (0, I, II, III), MA to VA, CO, WI.

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### Clintonia

GALL, Leaf; False Rust. *Synchytrium aureum*, WI.

ROT, Leaf. *Ceratobasidium anceps*, ME, NY, WI.

RUST. *Puccinia mesomajalis* (III), CA, ID, MI, MN, MT, NH, NY, OR, TN, VA, WA, WI.

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### Clivia

NEMATODE, Spiral. *Rotylenchus brachyurus*.

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### Clover (*Trifolium incarnatum*, *T. pratense*, *T. repens*, *T. stoloniferum*, *T. subterraneum*, *T. vesiculosum*)

BLACK SPOT, *Pseudomonas andropogonis*, NC.

BLIGHT, Root; Crown Rot. *Pythium ultimum*; *P. irregulare*; *Fusarium proliferatum*; *Rhizoctonia solani*, GA, TX.

LEAF SPOT. *Cercospora zebrina*, TX.

NEMATODE, Root-Knot. *Meloidogyne graminicola*, MS.

VIRUS. *Clover Yellow Mosaic*; *Crimson Clover Latent*; *Cucumber Mosaic*; *Peanut Stunt*, MO; *Red Clover Vein Mosaic*; *Subterranean*

**Clover Red Leaf**, CA; **White Clover Mosaic**; **Alfalfa Mosaic**, WI; **Bean Yellow Mosaic**, AK.

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### **Coccoloba (Sea-Grape, Dove-Plum)**

BLACK MILDEW. *Lembosia coccolobae*; *L. philodendri*; *L. portoricense*; *L. tenella*, FL.

LEAF SPOT. *Pestalotia coccolobae*, FL.

RUST. *Puccinia canaliculata*, GA; *Uredo coccolobae*; *U. uviferae* (II), FL.

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### **Cocklebur (*Xanthium*)**

DOWNY MILDEW. *Plasmopara halstedii*, ND.

NEMATODE, Root Knot. *Meloidogyne hapla*.

ROT, Stem. *Sclerotinia trifoliorum*, MD; *S. sclerotiorum*, MD; *S. minor*, MD.

RUST. *Puccinia canaliculata*, KS; *P. xanthii*, KS.

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### **Cockscomb (*Celosia argentia*)**

DAMPING-OFF. *Rhizoctonia solani*, CT.

LEAF SPOT. *Cercospora celosiae*, AL, OK; *Phyllosticta* sp., NJ; *Alternaria* sp., NJ.

NEMATODE, Root Knot. *Meloidogyne* sp., KS, OH, TX.

ROT, Charcoal. *Macrophomina phaseoli*, TX.

VIRUS. **Beet Curly Top**, CA, TX; **Cucumber Mosaic**, NY.

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### **Cocoa (*Theobroma cacao*)**

GALL. *Agrobacterium tumefaciens*, FL.

ROT, Pod. *Phytophthora palmivora*, Puerto Rico.

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### **Cocoa-Plum (*Chrysobalanus*)**

LEAF SPOT. *Cercospora chrysobalani*, FL.

LEAF SPOT, Algal. *Cephaleuros virescens*, FL.

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### **Cocoyam (*Xanthosoma*)**

BACTERIAL Leaf Spot. *Xanthomonas campestris* pv. *dieffenbachiae*, FL.

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### **Codonanthe**

VIRUS. **Tobacco Mosaic**, CA, CT, DC, FL, OH, WA.

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### **Coffee-Berry (*Rhamnus californicus*)**

BLIGHT, Sudden Oak Death. *Phytophthora ramorum*, CA.

LEAF SPOT. *Phaeosphaerella rhamni*, CA.

RUST. *Puccinia mesneriana* (III), CA.

SOOTY MOLD. *Capnodium* sp., CA.

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### **Coleus**

BROOMRAPE. *Orobanche ramosa*, NY.

DAMPING-OFF; Cutting Rot. *Pythium* spp., CA, MD; *Rhizoctonia solani*, FL, IL, NY, TX.

DOWNY MILDEW. *Peronospora lamii*, LA, NY.

LEAF SPOT. *Alternaria* sp., NJ; *Phyllosticta* sp., NJ.

NEMATODE, Leaf. *Aphelenchoides fragariae*, NJ.

NEMATODE, Root Knot. *Meloidogyne* spp., AL, CA, CT, MD, MO, NJ, NY, OK.

NONPARASITIC. **Crinkle**. Genetic leaf deformity.

ROT, Gray Mold; Leaf Blight. *Botrytis cinerea*, AK, MO.

SLIME MOLD. *Badhamia panicea*, KS.

VIRUS. **Coleus Mosaic**; **Coleus Vein Necrosis**, **Tobacco Etch Virus**, MN, MO.

WILT. *Verticillium* sp., CT.

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### **Collards**

► Cabbage.

Subject to downy mildew and *Sclerotinia* rot.

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### **Collinsia (Blue-Lips, Blue-Eyed Mary)**

LEAF SPOT. *Septoria collinsiae*, IL.

ROT, Root. *Pythium mamillatum*, CA.

RUST. *Aecidium insulum* (0, I), UT;  
*Puccinia collinsiae* (0, I, II, III), CA, OR,  
 UT, WA.

SMUT, White. *Entyloma collinsiae*, CA, OR.

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### **Collinsonia (Horse-Balm)**

BLACK SPOT, on stem. *Phyllachora* sp., PA.

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### **Collomia**

NEMATODE, Bulb. *Ditylenchus dipsaci*, Pacific Northwest.

POWDERY MILDEW. *Sphaerotheca macularis*, CA, CO, ID, MT, ND, WA, WY.

RUST. *Puccinia giliae* (II, III), CA, WA; 0, I unknown; *P. plumbaria* (0, I, III), NV;  
*Uromyces acuminatus* var. *polemonii* (0, I), CO, NE, ND; II, III on marsh grass.

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### **Coltsfoot (*Tussilago*)**

LEAF SPOT. *Mycosphaerella tussilaginis*, NY;  
*Septoria farfaricola*, TN.

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### **Columbine (*Aquilegia*)**

BLIGHT, Gray Mold. *Botrytis cinerea*;  
*B. streptothrix*.

DAMPING-OFF; Root Rot. *Rhizoctonia solani*, IL.

LEAF SPOT, *Ascochyta aquilegiae*, CT, IL, IA, NJ, NY, PA, TX, WI; *Cercospora aquilegiae*, KS, OR; *Septoria aquilegiae*, CT, IN, MI, NY, OH, VT, VA, WI;  
*Haplobasidium pavoninum*, AK.

NEMATODE, Root Knot. *Meloidogyne* sp.

POWDERY MILDEW. *Erysiphe polygoni*, AK, IL, IN, IA, NJ, NY, OH, PA, TX, UT, WI, WY.

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ROT, Root. *Phymatotrichum omnivorum*, TX;  
*Pythium mamillatum*, CA; *Phytophthora dreschleri*, NC.

ROT, Stem. *Phoma* sp., PA; *Sclerotinia sclerotiorum*, DE, OH, PA, TX; *Phyllosticta aquilegicola*, WA.

RUST. *Puccinia recondita* (0, I), CA, CO, ID, NM, OR, WA; II, III on grasses.

SMUT, Leaf and Stem. *Urocystis sorosporioides*, UT.

VIRUS. *Cucumber Mosaic*, OH; *Mosaic*, unidentified, IA, KS.

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### **Columbo (*Frasera*)**

LEAF SPOT. *Asteroma fraseriae*, black mildew, CO, ID; *Cercospora fraseriae*, CO, UT;  
*Marssonina fraseriae*, ID, WA; *Phyllosticta fraseriae*, CO.

RUST. *Uromyces speciosus* (II, III), CO, NM; 0, I, unknown.

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### **Columnea**

VIRUS. *Tomato Spotted Wilt*, PA.

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### **Commelina (*C. diffusa*)**

VIRUS. *Aneilema Mosaic*, FL; *Commelina Mosaic*, FL; *Cucumber Mosaic*, FL; *Tradescantia/Zebrinia Mosaic*, FL.

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### **Confederate-Jasmine (*Trachelospermum*)**

BLACK MILDEW; Sooty Mold. *Dimerosporium pulchrum*, LA.

LEAF SPOT. *Cercospora repens*, LA.

ROT, Root. *Clitocybe tabescens*, FL.

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### **Coral-Bells**

► *Heuchera*.

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### **Coralberry (*Symphoricarpos orbiculatus*)**

CANKER; Stem Gall. **Phomopsis** sp., MD.

LEAF SPOT. **Cercospora symphoricarpi**, KS, NE, TX.

POWDERY MILDEW. **Microsphaera diffusa**, general.

ROT, Berry. **Alternaria** sp., CT.

ROT, Root. **Helicobasidium purpureum**, TX; **Phymatotrichum omnivorum**, TX.

RUST. **Puccinia crandallii** (0, I), KS, MO, OK.

SPOT ANTHRACNOSE. **Sphaceloma symporicarpii**.

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### **Cordia**

POWDERY MILDEW. **Golovinomyces cichoracearum**, TX.

ROT, Root. **Clitocybe tabescens**, FL; **Phymatotrichum omnivorum**, TX.

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### **Coreopsis (Tickseed)**

BACTERIAL, MLO. **Aster Yellows**, NJ, NY, and **California Aster Yellows**, CA.

BLIGHT, Gray Mold. **Botrytis cinerea**, AK.

BLIGHT, Southern. **Sclerotium rolfsii**, FL, TX.

BROOMRAPE. **Orobanche ramosa**, TX.

CANKER, Basal. **Fusarium oxysporum**, CT, NY.

DODDER. **Cuscuta** sp., NJ.

LEAF SPOT. **Cercospora coreopsisidis**, OK; **Phyllosticta coreopsisidis**, WI; **Septoria coreopsisidis**, IA, WI, TX.

NECROSIS, Foliar. **Fusarium oxysporum**, CT, NY.

NEMATODE, Root Knot. **Meloidogyne** sp., FL.

POWDERY MILDEW. **Golovinomyces cichoracearum**, MD, MN, NY, WI.

ROT, Root. **Rhizoctonia solani**, MN, NY, TX; **Phymatotrichum omnivorum**, TX; **Fusarium oxysporum**, CT, NY.

ROT, Stem. **Sclerotinia sclerotiorum**, OH, WA.

RUST. **Coleosporium inconspicuum** (II, III), GA, MD, NC, OH, SC, TN, VA, WV; 0, I on pine.

SCAB. **Cladosporium coreopsisidis**.

VIRUS. **Beet Curly Top**, CA; **Lettuce Mosaic**, WA.

WILT. **Verticillium albo-atrum**, NY.

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### **Coriander (*Coriandrum*)**

ANTHRACNOSE. **Gloesporium** sp., MD.

BACTERIAL Leaf Spot. **Pseudomonas syringae**, CA, FL; **Xanthomonas campestris** pv. **carotae**, OR.

NEMATODE, Root Knot. **Meloidogyne** sp., FL.

VIRUS. **Coriander Feathery Red Vein**, CA.

WILT. **Fusarium oxysporum** f. sp. **coriandrii**, CA.

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### **Corn, Sweet (*Zea mays* var. *saccharata*)**

BACTERIAL Leaf Blight. **Acidovorax avenae** syn. **Pseudomonas avenae**, IL.

BACTERIAL Leaf Stripe. **Pseudomonas andropogonis**, FL.

BACTERIAL Spot. **Pseudomonas syringae**, MA.

BACTERIAL Stalk Rot. **Erwinia dissolvens**, FL, WV.

BACTERIAL Wilt. **Erwinia stewartii**, general; **Clavibacter michiganensis** subsp. **nebraskensis**, IN, MN, TX.

BLIGHT, Leaf. **Helminthosporium turcicum** syn. **Exserohilum turcicum**), HI, IL, TX; middle Atlantic and southern states, occasional in central states; **H. maydis** (*Cochliobolus heterostrophus*), southern leaf blight; **Clavibacter michiganensis** subsp. **nebraskensis**, IN; **Pantoea agglomerans**, Mexico.

BLIGHT, Seedling; Stalk Rot; Ear Rot. **Penicillium oxalicum**.

DOWNY MILDEW. **Peronosclerospora sorghi**, IL.

LEAF SPOT. **Cercospora zeae-maydis**, VA, Ontario, Canada; **Phaeosphaeria maydis**, FL; **Physoderma maydis**, brown spot, in South; Eyespot, **Kabatiella zeae**; **Pantoea ananatis**, Argentina.

LEAF STRIPE. *Burkholderia gladioli*, Mexico.  
 LESIONS, Stem. *Rhizoctonia solani*, MS.  
 NEMATODE, Lesion. *Pratylenchus penetrans*.  
 NEMATODE, Root Knot. *Heterodera zeae*, VA;  
**Meloidogyne chitwoodi**, Pacific NW;  
**M. hapla**, Pacific NW.  
 ROOT DISEASE. *Fusarium oxysporum*, **F. solani**,  
**F. acuminatum**, **F. proliferatum**, MN.  
 ROT, Black Bundle Disease. *Cephalosporium*  
**acremonium**, MT.  
 ROT, Dry Ear. *Nigrospora sorghi*, IA.  
 ROT, Ear, Root and Stalk; Seedling Blight.  
**Diplodia zeae**, ME to VA, SD, TX; *Fusarium*  
 spp.; **F. moniliforme**, cosmopolitan;  
**Burkholderia gladioli**, MS.  
 ROT, Root. *Gibberella zeae*, chiefly east of Mis-  
 sissippi River; *Phoma terrestris*, DE, MD;  
**Pythium** spp., IL, IA, OH, TX;  
**Helminthosporium pedicellatum**, CA;  
**Exserohilum pedicellatum**, TX; *Phomus*  
**terrestris**, NC.  
 ROT, Stem. *Burkholderia gladioli*, Mexico.  
 RUST. *Puccinia sorghi* (II, III), general; 0, I on  
 oxalis; **P. polysora**, GA, Southern U.S.  
 SMUT. *Ustilago maydis*, general, FL, IL, MI, MN,  
 NY, TX, WI; *Sphacelotheca reiliana*, Head  
 Smut.  
 SMUT, False. *Ustilaginoidea virens*, MS.  
 VIRUS. **Barley Yellow Dwarf**, IL; **Corn Leaf**  
**Fleck**; **Corn Mosaic**, **Corn Stunt**, AL, AZ,  
 CA, GA, IN, KY, MO, SC; **Wheat Streak**  
**Mosaic**, CO, ID, IN, KS, MI, NE, OH, TX,  
 UT; **Cucumber Mosaic**, celery strain; **Maize**  
**Chlorotic Mottle**, HI, KS, NE; **Maize Dwarf**  
**Mosaic**, AL, AZ, AR, CA, GA, ID, IA, MO,  
 NJ, NM, NY, OH, PA, WA; **Maize Rayado**  
**Fino**; **Maize Stripe**, FL; **Sorghum Stunt**  
**Mosaic**, CA; **Oat Blue Dwarf**. **Marafivirus**,  
 North America, Great Plains.  
 WILT, STUNT. *Phytophthora sansomeana*, OH.  
 WILT, Vascular. *Pantoea agglomerans*,  
 Mexico.  
 WITCHWEED. *Striga asiatica*, on roots, NC.

Smut is the most conspicuous corn disease in home gardens. Bacterial wilt is dependent on survival of insect vectors and may be serious after a warm winter unless resistant hybrids are used.

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### Corncockle (*Agrostemma*)

LEAF SPOT. *Gloeosporium* sp., IN; *Marssonina*  
**delastrei**, IL, IN, MI, MS, MO; *Septoria*  
**lychnidis** var. **pusilla**, ND.  
 ROT, Root. *Phymatotrichum omnivorum*, TX.  
 ROT, Stem. *Fusarium* sp., IN.

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### Corn-Marigold (*Chrysanthemum segetum*)

BACTERIAL, MLO. **California Aster Yellows**, CA.  
 LEAF SPOT. *Septoria chrysanthemi*, NY.

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### Corydalis

DOWNY MILDEW. *Peronospora corydalis*, IN,  
 MD, MA, OK, TX.  
 LEAF SPOT. *Septoria corydalis*, TX, WI.  
 NEMATODE. *Meloidogyne* sp., FL.  
 RUST. *Puccinia aristidae* (0, I), CO, KS,  
 NE; II, III on grasses; **P. brandegei** (III)  
 CO, WA.

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### Cosmos

BACTERIAL, MLO. **Aster Yellows**, DE, NJ, NY,  
 and **California Aster Yellows**, CA.  
 BACTERIAL Wilt. *Pseudomonas solanacearum*,  
 NC.  
 BLIGHT, Southern. *Sclerotium rolfsii*, MS.  
 CANKER, Stem Blight. *Diaporthe stewartii*, CT  
 to NJ, CA, KS, SD, TX.  
 DODDER. *Cuscuta* sp., NY.  
 LEAF SPOT. *Cercospora* sp., TX; *Septoria* sp.,  
 CT.  
 MOLD, Gray. *Botrytis cinerea*, Brazil.  
 NEMATODE, Root Knot. *Meloidogyne* sp.  
 POWDERY MILDEW. *Golovinomyces*  
**cichoracearum**, CA, MD, NE, NC, TX.  
 ROT, Root. *Phymatotrichum omnivorum*,  
 AZ, TX; *Macrophomina phaseoli*, TX;  
**Pythium** sp., MD; *Rhizoctonia solani*, CT,  
 MD, TX.



VIRUS. **Beet Curly Top; Mosaic**, unidentified, FL, TX; **Tomato Spotted Wilt**, TX.  
WILT. **Fusarium** sp., NJ; **Verticillium dahlia**, CA.

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### Cotoneaster

BACTERIAL Fire Blight. **Erwinia amylovora**, widespread.  
BACTERIAL Hairy Root. **Agrobacterium rhizogenes**, central states.  
CANKER, Twig Blight. **Physalospora obtusa**, NY to OH, TX; **Diplodia** sp., TX; **Gibberella baccata**, CA.  
LEAF SPOT. **Fabraea maculata**, CA, IA; **Phyllosticta cotoneastri**, MD; **P. cydoniae**, MS.  
POWDERY MILDEW. **Podosphaera** sp., CA.  
ROT, Root. **Armillaria mellea**, CA; **Clitocybe tabescens**, FL; **Phymatotrichum omnivorum**, AZ, TX; **Phytophthora** sp.  
SCAB. **Venturia** sp., WA.

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### Cotton (*Gossypium*)

CANKER, Stem. **Phoma exigua**, NC, VA.  
NEMATODE. **Rotylenchus reniformis**, VA.  
ROT, Lint. **Nigrospora oryzae**, AL.  
ROT, Root. **Rhizoctonia solani**, MS.  
ROT, Stem. **Sclerotinia sclerotiorum**, ND.

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### Coursetia

RUST. **Phragmopyxis acuminata** (0, III), AZ, CA.

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### Cowania

RUST. **Phragmidium andersonii** (I, II, III), ID.

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### Cowpea (*Vigna sinensis*)

LEAF AND STEM DISEASE. **Cercospora cebrina** (clover isolate), NC.

POD SPOT, Black; Seed. **Phomopsis longicolla**, MS.

ROT, Root. **Phytophthora megasperma**, NC.

VIRUS. **Brome Mosaic**, CA; **Cowpea Aphid-Borne Mosaic**, AR; **Cowpea Severe Mosaic**, AR, IN, LA.

WILT. **Fusarium oxysporum** f. sp. **tracheiphilum**, CA.

Cowpeas are of most interest to gardeners as a green manure crop, and there is little need of repeating here the long list of possible diseases, most of which are given under Bean. Ashy stem blight, charcoal rot, is fairly serious. The root-knot nematode is general, but varieties Iron and Bragham are almost immune. Fusarium wilt, general in the South, is largely controlled by using resistant varieties. Leaf spots are numerous, and some may cause defoliation. Rust is widespread on Blackeye and related varieties, but many varieties are resistant.

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### Crabapple, Flowering (*Malus*)

ANTHRACNOSE. Northwestern. **Neofabraea malicorticis**, OR.

BACTERIAL Fire Blight. **Erwinia amylovora**, widespread.

BLIGHT, Thread. **Pellicularia koleroga**, LA.

BLOTCH, Sooty. **Gloeodes pomigena**, IN.

CANKER, Blister. **Nummularia discreta**, WV.

CANKER, Coral Spot; Twig Blight. **Nectria cinnabarina**, AK.

CANKER; DIEBACK. **Valsa leucostoma**, WV; **Physalospora obtusa**, MI; **Sphaeropsis pyriputrescens**, WA; **Phacidiopycnis washingtonensis** (also Fruit Rot), WA.

LEAF SPOT. **Cercospora pirina**, IL, WI; **Coniothyrium pirinum**, WI; **Fabraea maculata**, AK, MD; **Illosporium malifoliorum**, WV; **Marssonina coronaria**, IN, IA, MO, WI; **Phyllosticta** sp., IA; **P. solitaria**, IN, IA, KS, OH, TX, WV; **P. zonata**, IA; **Septoria pyri**.

MISTLETOE, European. **Viscum album**, CA.

POWDERY MILDEW. **Oidium pyrinum**, WI; **Phyllactinia corylea**, WA; **Podosphaera**

**leucotricha**, IL, IA; **P. oxyacanthae**, WA, WI.

ROT, Black, Fruit, Leaf Spot. **Physalospora obtusa**, eastern and central states.

ROT, Heart. **Ganoderma applanatum**.

ROT, Root. **Armillaria mellea**, WA; **Phymatotrichum omnivorum**, TX.

RUST. **Gymnosporangium clavipes**, CT, NJ; **G. globosum**, AL, IN, KS, NJ, SC, VA; **G. juniperi-virginianae**, cedar-apple rust, general; **G. libocedri**, AK, OR; **G. nelsonii**, AK, WA; **G. nootkatense**, AK; **G. yamadae**, DE, PA.

SCAB. **Venturia inaequalis**, general.

SCAB, Twig Infections. **Venturia inaequalis**, MA, OH, PA, RI.

Cedar-apple rusts are common and injurious on most native crabapples; asiatic varieties are usually resistant. Remove red-cedars in the vicinity.

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### Cranberry (*Vaccinium*, subgenus *Oxycoccus*)

DIEBACK. **Diaporthe vaccinii**, WI.

GALL, Red Leaf. **Synchytrium vaccinii**, NJ.

GALL; Shoot Hypertrophy; Rose-bloom. **Exobasidium vaccinii**, general; **E. oxycocci**, MA.

LEAF SPOT. **Discohainesia oenotherae**, also storage rot, MA, NJ, OR, WA, WV; **Mycosphaerella nigromaculans**, black spot, OR, WA; **Phyllosticta putrefaciens**, also berry rot, MA, NJ; **Ramularia multiplex**, MI, NY, WI; **Venturia compacta**, leaf smudge, general; **Cladosporium oxycocci**, leaf mold, NJ, WA.

NEMATODE. **Atylenchus decalineatus**.

NEMATODE, Sheath. **Hemicycliphora similis**.

NEMATODE, Stubby Root. **Paratrichodorus christiei**.

POWDERY MILDEW. **Microsphaera alni** var. **vaccinii**, AL, NJ, OH.

ROT, Berry; Blotch. **Acanthorhynchus vaccinii**, ME to NC, WI, OR, WA; **Ceuthospora lunata**, black rot, MA, NJ, OR, WA, WI; **Curvularia inaequalis**, IL, NJ, WI;

**Sphaeronema pomorum**, NJ; **Sporonema oxycocci**, AK, ME, MA, NJ, OR, WA, WI.

ROT, Berry Speckle. Several fungi associated.

ROT, Bitter; Leaf Spot. **Glomerella cingulata** var. **vaccinii**, general; **Phyllosticta vaccinii**, WI.

ROT, Early; Scald, Blast. **Guignardia vaccinii**, general; **Phyllosticta vaccinii**, WI.

ROT, End. **Godronia cassandrae**, general.

ROT, Fairy Ring; Root. **Psilocybe agrariella** var. **vaccinii**, MA, NJ.

ROT, Fruit. **Acanthorhynchus vaccinii** and **A. alba**, North America; **Gliocephalotrichum bulbilium**, MA, NJ.

ROT, Hard; Twig Blight. **Monilinia oxycocci**, MA, ME, OR, WA, WI.

ROT, Root; DIEBACK. **Phytophthora cinnamomi**, MA.

ROT, Storage. **Penicillium** spp., cosmopolitan; **Diaporthe vaccinii**, general; **Botrytis cinerea**, gray mold, also blossom blight; **Alternaria** sp.; **Dematium** spp.; **Melanospora destruens**, in market; **Gloeosporium minus**, MD, NJ; **Pestalotia vaccinii**; **Stemphylium ilicis**.

ROT, Witches' Broom. **Naevia oxycocci**, ME, MI, NH, NY.

RUST. **Pucciniastrum vaccinii** (II, III), OR, UT, WA; 0, I on hemlock.

VIRUS. **Cranberry False-Blossom**, ME to NJ, OR, WA, WI; **Cranberry Ring Spot**, WI.

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### Crape-Myrtle (*Lagerstroemia*)

BLIGHT, Thread. **Rhizoctonia ramicola**, FL.

LEAF SPOT. **Cercospora lythracearum**, TX; **Cercospora** sp., blotch, FL, TX; **Phyllosticta lagerstroemiae**, tip blight, LA, TX.

NONPARASITIC. **Chlorosis**. Manganese deficiency.

POWDERY MILDEW. **Uncinuliella australiana**, general; **Phyllactinia corylea**, AL.

ROT, Root. **Clitocybe tabescens**, FL; **Phymatotrichum omnivorum**, TX.

SOOTY MOLD. **Capnodium** spp., in aphid honeydew.

Mildew is serious on crape-myrtle, calling for sprays as the buds break.

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## Crassula

ANTHRACNOSE. *Gloeosporium* sp., NJ.

LEAF SPOT. *Phomopsis* sp., CT.

NEMATODE, Leaf. *Aphelenchoides* sp.

ROT, Root. *Armillaria mellea*, CA; *Pythium* sp., NJ, NY.

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## Creeping Zinnia (*Sanvitalia procumbens*)

VIRUS. Sunflower Mosaic, TX.

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## Creosote Bush (*Larrea*)

BLIGHT. *Omphalia* sp.

MISTLETOE. *Phoradendron californicum*, TX to CA.

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## Crinum

LEAF SCORCH; Red Blotch. *Stagonospora curtisii*, CA, NY.

LEAF SPOT. *Cercospora pancratii*, AL, FL, MS.

VIRUS. Mosaic. Unidentified.

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## Crocus

BACTERIAL Scab. *Pseudomonas marginata*, occasional on imported stocks.

ROT. Corm. *Fusarium oxysporum*, NY, PA;

*Stromatinia gladioli*, dry rot, widespread;

*Penicillium* sp., blue mold.

VIRUS. Iris Mosaic, CA, MD.

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## Crotalaria (*C. retusa*)

BLIGHT, Seedling. *Alternaria cassiae*, MS.

POWDERY MILDEW. *Oidium erysiphoides* var. *crotalariae*, LA, MS.

VIRUS. Potato Virus X, on *C. juncea*.

WILT; Root Rot. *Fusarium* sp., GA, TX.

This species is sometimes grown as an ornamental. Crotalaria as a cover crop has more diseases, but *C. spectabilis* is immune to root-knot nematode and so particularly useful between susceptible crops.

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## Croton (*Codiaeum*)

ANTHRACNOSE. *Gloeosporium* spp., FL, NJ.

ROT, Root. *Phymatotrichum omnivorum*, TX.

This is the croton of florists.

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## Croton (*Croton*)

DODDER. *Cuscuta indecora*, TX.

GALL, Leaf. *Kutilakesa pironii*, FL.

LEAF SPOT. *Cercospora capitati*, TX; *C. crotonicola*, SC, TX; *C. crotonis*, AL, FL, SC; *C. crotonophila*, WI; *C. maritima*, MS; *C. crotonifolia*, SC.

NEMATODE, Lesion. *Pratylenchus* sp., FL.

ROT, Root. *Phymatotrichum omnivorum*, TX.

RUST. *Bubakia crotonis* (II, III), KY to AL, AZ, CA, FL, NE, TX.

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## Crowberry (*Empetrum*)

RUST. *Chrysomyxa empetri* (II, III), ME, NH, NY.

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## Crown Vetch (*Coronilla varia*)

NEMATODE. *Meloidogyne* sp., VA.

ROT, Stem. *Sclerotinia trifoliorum*; *Fusarium roseum*.

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## Cryptantha

GALL, Leaf. *Synchytrium myosotidis*, AZ, CA.

POWDERY MILDEW. *Golovinomyces cichoracearum*, CA, NV.

RUST. *Puccinia aristidae* (0, I); II, III on native grasses; *P. cryptanthae*, CA, WA.

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## Cryptanthus

ANTHRACNOSE. *Gloeosporium* sp., WA.

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## Cryptomeria

BLIGHT, Leaf and Twig. *Diaporthe eres*; *Phyllosticta cryptomeriae*, VA and general U.S.

LEAF SPOT. *Pestalotia cryptomeriae*, SC; *P. funerea*, NJ.

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## Cucumber (*Cucumis sativus*)

ANTHRACNOSE. *Colletotrichum lagenarium*, general.

BACTERIAL Angular Leaf Spot. *Pseudomonas syringae* pv. *lachrymans*, general.

BACTERIAL Soft Rot. *Erwinia aroideae*; *E. carotovorus*.

BACTERIAL Spot. *Xanthomonas cucurbitae*, MA, MI.

BACTERIAL Wilt. *Erwinia tracheiphila*, general.

BLIGHT, Blossom; Fruit Rot. *Choanephora cucurbitarum*, FL, GA, NJ, OK, RI, TX.

BLIGHT, Gummy Stem; Black Fruit Rot. *Mycosphaerella citrullina*, widespread; *M. melonis*, AZ.

BLIGHT, Leaf. *Alternaria cucumerina*, general.

BLIGHT, Southern. *Sclerotium rolfsii*, VA to FL, TX.

DAMPING-OFF. *Rhizoctonia solani*, also stem rot; *Pythium* spp.

DODDER. *Cuscuta gronovii*, NY.

DOWNY MILDEW. *Pseudoperonospora cubensis*, general; U.S., Beirut, Lebanon.

LEAF SPOT. *Cercospora cucurbitae* AL, DE, IA, NJ, TX, WI; *Ascochyta* sp., OR; *Gloeosporium* sp. IL; *Phyllosticta cucurbitacearum*, DE, OH, TX; *Septoria cucurbitacearum*, DE, MA, NH, PA; *Stemphylium cucurbitacearum*, OH; *Alternaria consortiale*, WA; *Ulocladium cucurbitae*, CA, NY.

MOLD. Seed. *Alternaria tenuis*, cosmopolitan; *Curvularia trifolii*, NJ.

NEMATODE, Hop Cyst. *Heterodera humuli*, OR.

NEMATODE, Root Knot. *Meloidogyne incognita*; *M. javanica*.

NONPARASITIC. *Chlorosis*. Nitrogen, manganese, or potassium deficiency.

POWDERY MILDEW. *Golovinomyces cichoracearum*, general; *Sphaerotheca fuliginea*, CA, NC; *Leveillula taurica*, ID.

ROT, Charcoal. *Macrophomina phaseoli*, IL.

ROT, Fruit. *Fusarium* spp., TX; *Rhizopus stolonifer*, occasional. *Diplodia natalensis*; *Botrytis cinerea*.

ROT, Root. *Fusarium solani* f. sp. *radicicola*, CT, OR, WA; *Phymatotrichum omnivorum*, TX.

ROT, Stem; Fruit. *Sclerotinia sclerotiorum*, occasional.

SCAB. *Cladosporium cucumerinum*, general.

VIRUS. *Bromegrass Mosaic Virus*, general; *Cucumber Mosaic*, general; *Beet Curly Top*, CA, ID, OR, TX, UT, WA; *Tobacco Ring Spot*, MD, PA, VA; *Zucchini Yellow Mosaic*, CA, FL, NY; *Cucurbit Leaf Curl*, AZ, NM, TX.

WILT. *Fusarium oxysporum* f. sp. *cucumerinum*, FL; *F. oxysporum* f. sp. *cucurbitae*; *Verticillium albo-atrum*, CA.

WILT, Basal Stem Lesions. *Phytophthora capsici*, Mexico.

Starting cucumbers under Hotkaps and then treating to control insect vectors helps to reduce bacterial wilt and virus diseases. Choose varieties resistant to mosaic and scab.

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## Culvers-Root (*Veronicastrum*)

LEAF SPOT. *Cercospora leptandrae*, WI; *Phyllosticta decidua*, TX, WI; *Ramularia veronicae*, TX; *Septoria veronicae*, WI.

POWDERY MILDEW. *Golovinomyces cichoracearum*, IL; *Sphaerotheca macularis*, CT, IL, IA, MD, MI, MO, WI.

ROT, Root. *Phymatotrichum omnivorum*, TX; *Rhizoctonia solani*, TX.

RUST. *Puccinia veronicarum* (III), IA, TX, WI.

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## Cunninghamia

LEAF SPOT. Necrotic. *Phomopsis* sp., OR.

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## Cuphea

BLIGHT, Gray Mold. *Botrytis cinerea*, occasional in greenhouses.

LEAF SPOT. *Septoria maculifera*, NY, PA, VA, WV.

NEMATODE, Root Knot. *Meloidogyne* sp., MD.

POWDERY MILDEW. *Erysiphe polygoni*, MD, VA.

ROT, Root. *Rhizoctonia solani*, IL.

WILT, Root Rot. *Sclerotinia sclerotiorum* MN, ND.

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## Currant (*Ribes* spp.)

ANTHRACNOSE; Fruit Spot. *Pseudopeziza ribis*, general.

BLIGHT, Cane. *Botryosphaeria ribis* var. **chromogena**, general.

BLIGHT, Gray Mold; Fruit Spot. *Botrytis cinerea*, Northeast, OR, WA.

BLIGHT, Thread. *Pellicularia koleroga*, FL.

CANKER, Cane Knot. *Thyronectria berolinensis*, CT to IN, KS, UT.

CANKER; DIEBACK. *Nectria cinnabarina*, ME to CO, WA; *N. ditissima*, MN, NY; Black Pustule, *Phragmodothella ribesia*, Northeast, Pacific Northwest.

DOWNY MILDEW. *Plasmopara viticola*, WI.

LEAF SPOT. *Alternaria* sp., MI; **Cylindrosporium ribis**, WI; **Mycosphaerella ribis**, ME to MD, AR, OR, WA.

LEAF SPOT, Angular. *Cercospora angulata*, NY to VA, KS, MN; *C. ribis*, AL, IN, IA.

POWDERY MILDEW. *Microsphaera grossulariae*, MT, NE, NH; *Sphaerotheca mors-uvae*, AK, CA, CT, MT, NE, OR, WA; **Phyllactinia corylea**, MI.

ROT, Berry. *Glomerella cingulata*, CT, PA.

ROT, Collar. **Fomes ribis**, NY to IN, MN, UT.  
ROT, Root. **Armillaria mellea**, CA, OR, WA; **Phymatotrichum omnivorum**, TX; **Hypholoma perplexum**, NY.

RUST, White Pine Blister. **Cronartium ribicola** (II, III), ME to VA, IL, MN, OR, SD, WA. **Puccinia caricis** (0, I), CT, IN, MD, NY, II, III on *Carex*.

VIRUS. **Currant Mosaic**, MD, NY.

WILT. **Verticillium** sp., NY.

Black currant is the most important host of white pine blister rust and should not be grown; red currants should be kept at least 300 feet from pines. Cut out canes with cane blight.

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## Currant, Flowering (*Ribes*)

ANTHRACNOSE. **Pseudopeziza ribis**, IL, IA, MN, MT.

BACTERIAL Leaf Spot. **Pseudomonas ribicola**.

BLIGHT; DIEBACK. *Botrytis cinerea*, AK, IN.

CANKER; DIEBACK. **Botryosphaeria ribis**, KS; **Phragmodothella ribesia**, NY; **Thyronectria berolinensis**, KS; **Nectria cinnabarina**, AK, KS.

LEAF SPOT. **Cercospora angulata**, MN; **C. ribicola**, OR, WA; **Marssonina ribicola**, CO; **Mycosphaerella aurea**, NY to KS, SD, WA; **M. ribis**, NY to KS, MN, UT; **Phyllosticta grossulariae**, IN; **Septoria sanguinea**, WA.

RUST. **Coleosporium jonesii**, MN; **Cronartium occidentale**, MT to NM, CA, WA; **C. ribicola**, ME to MD, CO, MN, NV, Pacific states; **Melampsora ribesii-purpureae**; II, III on willow; **Puccinia caricina**, NY to IA, AK, CA, OR; **P. micrantha**; **P. parkerae**.

VIRUS. Viruslike vein-banding, CA, CT, MN, NJ, NY, OR, RI, WA.

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## Cycad, Sago-Palm (*Cycas*)

CORALLOID ROOTS. **Anabaena cycadearum** and **Nostoc commune**, algae, and bacterium *Azotobacter* are associated with roots but are mostly innocuous.

LEAF SPOT. *Ascochyta cycadina*, MO, TX; *Pestalotia cycadis* (secondary), CT, FL.

VIRUS. **Tobacco Ringspot**, FL.

A destructive blight of unknown cause (but with *Gloeosporium* and *Phoma bresadolae* often associated with it) causes pale green areas on pinnae of young leaves, which are curled out of the flat plane and dieback. The disease is apparently systemic and increases annually until death. Eradication of blighted plants is the only control suggested.

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## Cyclamen

ANTHRACNOSE. *Colletotrichum fragariae*, NC.

BACTERIAL Tuber Rot. *Erwinia carotovora*, NJ, NY, OH.

BLIGHT; Bud and Leaf Rot; Petal Spot. *Botrytis cinerea*, cosmopolitan.

BLIGHT, Leaf and Bud. *Glomerella cingulata*, IN, MA, MO, NJ, OH, PA, TX, VA.

LEAF SPOT. *Phyllosticta cyclaminicola*, IL, OH, TX; *P. cyclaminis*, VA; *Systoria cyclaminis*, CA; *Colletotrichum gloeosporioides*, FL; *C. fragariae*, FL; also lesions on flowers and stems.

LEAF SPOT; Stunt; White Mold. *Ramularia cyclaminicola* (*Cladosporium cyclaminis*), CA, IL, MN, NJ, NY, OH, PA.

NEMATODE, Leaf. *Aphelenchoides fragariae*.

NEMATODE, Lesion. *Pratylenchus pratensis*, VA.

NEMATODE, Root Knot. *Meloidogyne* sp., cosmopolitan.

ROT, Root. *Thielaviopsis basicola*, CT.

VIRUS. **Impatiens Necrotic Spot**, NC.

WILT. *Fusarium oxysporum* f. sp. *cyclaminis*, CA, NJ; *Fusarium* sp., NJ.

Discard plants with stunt; sterilize soil and pots, and benches where diseased plants have grown. Avoid splashing to reduce *Botrytis* blight and leaf nematodes. Spray for blight and leaf spots with zineb or ferbam.

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## Cynoglossum (Hounds-Tongue)

BLIGHT, Southern. *Sclerotium rolfsii*, FL.

DOWNY MILDEW. *Peronospora cynoglossi*, IL, MD, TX.

LEAF SPOT. *Cercospora cynoglossi*, IN; *Phyllosticta decidua*, WI; *Ramularia lappulae*, WI, TX.

NEMATODE, Root Knot. *Meloidogyne* sp.

POWDERY MILDEW. *Golovinomyces cichoracearum*, UT, VA, WY.

ROT, Root. *Phymatotrichum omnivorum*, TX.

ROT, Stem. *Sclerotinia sclerotiorum*, WA, British Columbia, Canada.

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## Cypress (*Cupressus*)

BACTERIAL Crown Gall. *Agrobacterium tumefaciens*, AZ, CA, FL.

BLIGHT, Nursery. *Phomopsis juniperovora*, MD, NC, VA.

BLIGHT, Seedling. *Fusarium solani*, TX.

BLIGHT, Twig. *Coryneum asperulum*, AL; *C. berckmansii*, OR; *Cercospora thujina*, AL, GA, LA; *Pestalotia funerea*, CA, TX; *Botryosphaeria* sp., GA, on Arizona cypress.

CANKER. *Seiridium cardinale*, CA, Chile.

CANKER, Bark. *Seiridium unicornae*, CA.

CANKER; DIEBACK. *Coryneum cardinale*, on Monterey, sometimes Italian cypress; *Cytospora canis*, CA, on Italian cypress; *Macrophoma cupressi*, AL, CA, FL, TX; *Monochaetia unicornis*, GA, SC.

MISTLETOE. *Phoradendron* sp., AZ, CA, OR.

NEEDLE CAST. *Lophodermium* sp., NJ.

NEMATODE, Lesion. *Pratylenchus thornei*.

ROT, Heart. *Fomes pini*, CA.

ROT, Root. *Clitocybe tabescens*, FL; *Phymatotrichum omnivorum*, TX; *Phytophthora cinnamomi*, LA.

ROT, Wood. *Stereum taxodii*, cause of "pecky" cypress; *Coniophora puteana*, CA; *Lenzites saepiaria*, cosmopolitan; *Polyporus* spp.; *Poria subacida*; *Steccherinum ochraceum*.

RUST. *Gymnosporangium cupressi* (III), on Arizona cypress.

*Coryneum* canker has killed thousands of Monterey cypress trees in California, and *Cytospora* canker has been fatal in a narrow belt along the coast.

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**Cypress-Vine (*Quamoclit*)**NEMATODE, Root Knot. *Meloidogyne* sp., AL.ROT, Root. *Phymatotrichum omnivorum*, TX.RUST. *Coleosporium ipomoeae* (II, III), IL, SC, TN.WHITE RUST. *Albugo ipomeae-panduratae*, MS, NM.

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**Cyrilla (Leatherwood)**CANKER, BROWN Felt. *Septobasidium sinuosum*, FL.LEAF SPOT. *Phyllosticta cyrillae*, FL.RUST. *Aecidium cyrillae*, FL, LA, MS.

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**Dahlia**BACTERIAL Crown Gall. *Agrobacterium tumefaciens*, CT, IL.BACTERIAL, MLO. *Aster* Yellows, MD.BACTERIAL Rot. *Erwinia carotovora*, MS, WA; *E. cytolitica*, NY.BACTERIAL Wilt. *Pseudomonas solanacearum*, DE, MI, MS, NJ, NC, OK, TX.BLIGHT, Blossom. *Choanephora americana*, FL; *Stemphylium floridanum*.BLIGHT, Gray Mold. *Botrytis cinerea*, cosmopolitan on flower buds.BLIGHT, Southern. *Sclerotium rolfsii*, FL, KS, MS, NJ, NC, TX.LEAF SPOT. *Alternaria* sp., VA to AL, MO, MI, secondary; *Cercospora* sp., FL, MS.NEMATODE, Bulb. *Ditylenchus destructor*, OR.NEMATODE, Leaf. *Aphelenchoides ritzemabosi*, CA.NEMATODE, Root. *Paratrichodorus pachydermus*, MI.NEMATODE, Root Knot. *Meloidogyne* sp., NC to AL, AZ, CA, MO, TX.POWDERY MILDEW. *Golovinomyces cichoracearum*, general; *Ersiphe polygoni*, CA, DE, GA, IA, MO, NJ, PA, VA; *Uncinula* sp., NC.ROT, Charcoal. *Macrophomina phaseoli*, OK, SC.ROT, Root. *Armillaria mellea*, CA; *Phymatotrichum omnivorum*; TX.ROT, Stem. *Sclerotinia sclerotiorum*, CA, ME, NY.ROT, Stem, Root, Cutting. *Pythium* spp.; *Rhizoctonia solani*; *Fusarium roseum*.SCAB. *Streptomyces scabies*, NC.SMUT, Leaf. *Entylooma dahliae*, CA, NJ, OR.VIRUS. **Dahlia Mosaic**, general; **Tomato Spotted Wilt**, CA, MI, NJ, NY, NC, OK, TX, WI; **Cucumber Mosaic**; **Tobacco Ring Spot**.WILT. *Fusarium oxysporum*; *Verticillium albo-atrum* (*V. dahliae*) IL, MI, MO, NJ, OH, TX.

Leafhopper injury, hopperburn, looks like a true disease. Margins of leaves turn brown, and there may be general stunting and yellowing. The spotted wilt virus causes yellow ring spots in dahlia foliage. Heavy, wet soil contributes to bacterial and fungus rots and wilts. Mildew is often prevalent in late summer.

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**Daisy, Oxeye (*Leucanthemum vulgare*)**BACTERIAL, MLO. *Aster* Yellows, KS, NJ, NY.BLIGHT, Southern. *Sclerotium rolfsii*, TX.LEAF SPOT. *Cylindrosporium chrysanthemi*, OK; *Septoria chrysanthemella*; *S. leucanthemi*, blotch, CT, NY.NEMATODE, Root Knot. *Meloidogyne* sp.NEMATODE, Stem. *Ditylenchus dipsaci*, NY.ROT, Root. *Phymatotrichum omnivorum*, TX.ROT, Stem. *Fusarium roseum* and *F. solani*, TX; *Sclerotinia sclerotiorum*, TX.VIRUS. **Potato Yellow Dwarf**, NY.

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**Dalibarda (Dewdrop)**LEAF SPOT. *Septoria dalibardae*, ME, MI, NH, NY, VT.

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**Dandelion (*Taraxacum*)**VIRUS. **Tomato Ringspot**, PA.

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## Daphne

- BLIGHT, Twig. **Botrytis** sp., Northeast, Northwest.  
 DIEBACK; Wilt. **Fusarium** sp., NJ.  
 LEAF SPOT; Leaf Drop. **Gloeosporium mezerei**, WA; **Marssonina daphnes**.  
 ROT, Collar, Stem. **Phytophthora cactorum**, CA, NY; **Rhizoctonia solani**, NY.  
 ROT, Stem; Wilt. **Sclerotium rolfsii**, FL.

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## Datura

- BACTERIAL Canker, Vascular. **Clavibacter michiganense**, WY. On *Datura* sp., *D. innoxia*, *D. metal*, *D. meteloides*, *D. mollis*, *D. stramonium*.  
 BLIGHT, Southern. **Sclerotium rolfsii**, FL.  
 LEAF SPOT; Pod Blight. **Alternaria crassa**, FL, WI.  
 NEMATODE, Root Knot. **Meloidogyne hapla**.  
 ROT, Root. **Thielaviopsis basicola**, WI.  
 VIRUS. **Bromegrass Mosaic**, general; **Tomato Spotted Wilt**, CA, TX; **Potato Leafroll**, Pacific NW.

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## Daylily (*Hemerocallis*)

- BLIGHT, Gray Mold. **Botrytis** sp., MD.  
 BLIGHT, Leaf. **Kabatiella** sp., secondary, MD.  
 LEAF SPOT. **Cercospora hemerocallis**, IL; **Heterosporium gracilis**, NJ, NY, TX; Leaf Streak, **Gloecephalus hemerocalli**, MS, and **Collecephalus hemerocalli**, LA, MS, PA.  
 NEMATODE, Root Knot. **Meloidogyne incognita**.  
 ROT, Root. **Sclerotium** sp., IN; **Phymatotrichum omnivorum**, TX; **Armillaria gallsia**, SC.  
 RUST. **Puccinia hemerocallidis**, FL, GA, HI, Costa Rica.

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## Decumaria

- LEAF SPOT. **Cercospora decumariae**, MS.

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## Delphinium (Larkspur)

- BACTERIAL Black Spot, Leaf Spot. **Pseudomonas syringae** pv. **delphinii**, ME to VA, MN, TX, rare in Pacific Coast states.  
 BACTERIAL Collar Rot. **Erwinia carotovora**, CA, NY.  
 BACTERIAL Crown Gall. **Agrobacterium tumefaciens**, WA.  
 BACTERIAL Foot Rot; Blackleg. **Erwinia carotovora** pv. **atroseptica**, general.  
 BACTERIAL, MLO. **California Aster Yellows** Stunt, "Greens", Pacific Coast and Rocky Mts.  
 BLIGHT, Gray Mold, Bud Rot. **Botrytis cinerea**, CT, MA, MN, MS, NY, WV, WI.  
 BLIGHT, Southern; Crown Rot. **Sclerotium rolfsii** (*S. delphinii*), general.  
 CANKER, Stem. **Diaporthe arctii**, MD, NY, NC, OH, PA; **Fusarium** spp., widespread; **F. oxysporum** f. sp. **delphinii**, wilt, NY; **Volutella** sp., MD; **Phoma** sp., CT, NJ, NY.  
 DAMPING-OFF; Root Rot. **Pythium** spp. and **Rhizoctonia solani**, cosmopolitan.  
 DOWNEY MILDEW. **Peronospora ficariae**, CA.  
 GALL, Leaf. **Synchytrium aureum**, IA.  
 LEAF SPOT. **Ascochyta aquilegiae**, CT; **Cercospora delphinii**, CO, MD; **Ovularia delphinii**, WY; **Phyllosticta** sp., NY; **P. delphinii**, CO; **Ramularia delphinii**, CA, CO, UT; **Septoria delphinella**, IL, KS, WI.  
 NEMATODE, Leaf and Stem. **Ditylenchus dipsaci**, OR, WA.  
 NEMATODE, Lesion. **Pratylenchus pratensis**.  
 NEMATODE, Root Knot. **Meloidogyne** spp., AZ, NJ, NY, VA, WA.  
 NONPARASITIC. **Chlorosis**. Low temperature and wet soil.  
**Variation**. Noninfectious, seed transmitted leaf-color anomalies.  
 POWDERY MILDEW. **Golovinomyces cichoracearum**, MA, MN, NY, WA; **Erysiphe polygoni**, general but some varieties resistant; **Sphaerotheca macularis**, CA.  
 ROT, Collar; Leaf Spot. **Diplodina delphinii**, CA, NY.  
 ROT, Crown. **Sclerotium delphinii**. See ►Blight, Southern.



ROT, Root. **Phymatotrichum omnivorum**, TX;  
**Pythium aphanidermatum**; **P. ultimum**;  
**P. vexans**.

ROT, Stem. **Phytophthora** sp., MN; **Sclerotinia sclerotiorum**, widespread.

RUST. **Puccinia delphinii** (III), CA; **P. recondita** (0, I), NE to NM, CA.

SMUT, Leaf and Stem. **Urocystis sorosporioides**, CA, KY, VA.

SMUT, White. **Entyloma winteri**, CA; **E. wyomingense**, WY.

VIRUS. **Delphinium Ring Spot**, CA; **Celery Calico**, CA, ID, WA; **Beet Curly Top**, CA; **Cucumber Mosaic**; **Tomato Spotted Wilt**, CA; **Delphinium Vein-Clearing**, AK.

WILT. **Verticillium albo-atrum**, NY, WA.

One of the chief delphinium problems is a condition known as “blacks”, which looks like a disease and is often confused with bacterial black spot but is caused by cyclamen mites. Plants are stunted and deformed; buds turn black. The bacterial disease causes black tar spots on leaves but no deformity, no stunting of the whole plant. Crown rot or southern blight is often fatal to delphiniums. When yellowing and wilting appear, check the soil around the crown for reddish sclerotia and white mycelium and take immediate sanitary measures. Many foot, collar, and root rots and stem cankers afflict delphinium. Because of these, many gardeners grow hybrid delphinium as biennials, rotating locations, choosing well-drained sites. Virus diseases are more important along the Pacific Coast. Use virus-free planting stock and rogue out infected individuals.

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## Demorphotheca

VIRUS. **Bidens Mottle**, FL.

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## Desert Bird of Paradise (*Caesalpinia*)

POWDERY MILDEW. **Leveillula taurica**, AZ.

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## Desert-Candle (*Eremurus*)

LEAF SPOT. **Myrothecium roridum**, OH.

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## Desert-Plume (*Stanleya*)

LEAF SPOT. **Cercospora nasturtii**, KS.

RUST. **Puccinia aristidae**, CO, NV.

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## Desert-Rose (*Adenium obesum*)

LEAF SPOT. **Aristastoma** sp., FL.

VIRUS. **Tomato Spotted Wilt**, FL; **Cucumber Mosaic**, FL.

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## Desert-Willow (*Chilopsis*)

DAMPING-OFF. **Pythium ultimum**, NE; **Rhizoctonia solani**, NE, TX.

LEAF SPOT. **Phyllosticta erysiphoides**.

ROT, Root. **Phymatotrichum omnivorum**, TX.

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## Desmodium (Arrowleaf)

VIRUS. **Peanut Mottle**, GA.

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## Deutzia

LEAF SPOT. **Cercospora deutziae**, DE, IA, TX; **Phyllosticta deutziae**, AL, IA, NJ, TX.

NEMATODE, Root Knot. **Meloidogyne** spp.

ROT, Root. **Armillaria mellea**, CA.

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## Devils-Club (*Oplopanax*)

BLIGHT, Gray Mold. **Botrytis cinerea**, AK.

LEAF SPOT. **Cercospora daemonicola**, OR.

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## Devilwood (*Osmanthus americanus*)

BLACK MILDEW. **Asterina asterophora**, FL, GA; **A. discoidea**; **A. purpurea**, FL; **Lembosia oleae**, MS; **Meliola amphitricha**, FL to MS.

LEAF SPOT. *Phyllosticta oleae*, FL, NC.

MISTLETOE. *Phoradendron serotinum*  
(*flavescens*), FL.

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### Dewberry (*Rubus*)

BACTERIAL Cane Gall. *Agrobacterium rubi*,  
NY, OR.

BACTERIAL Crown Gall. *Agrobacterium*  
*tumefaciens*, general.

BACTERIAL Hairy Root. *Agrobacterium*  
*rhizogenes*, OR.

BLACK MILDEW. *Irenina sanguinea*, AL, LA.

BLIGHT, Cane; DIEBACK. *Leptosphaeria*  
*coniothyrium*, general; *L. thomasiana*,  
OR, WA.

BLIGHT, Spur. *Didymella appplanata*, OR, WA.

BLIGHT, Stamen; Dry Berry. *Hapalosphaeria*  
*deformans*, OR, WA.

BLOTCH, Sooty. *Gloeodes pomigena*, NC, PA.

CANKER; Cane Spot. *Ascospora ruborum*, AL,  
CA.

CANKER; Fruit Rot. *Glomerella cingulata*, GA,  
IL, MD, MS.

DOWNY MILDEW. *Peronospora rubi*, FL, MD,  
WI, WA; *P. potentillae*, CT, IL, LA.

FRUIT SPOT; Flyspeck. *Leptothyrium pomi*, NC.

GALL, Yellow Leaf. *Synchytrium aureum*, WI.

LEAF SPOT. *Mycosphaerella confusa*, NJ to FL,  
IL, TX; *Pezizella oenotherae*, MD to NC;  
*Phyllosticta ruborum*, NY; *P. dispersans*,  
IL; *Septoria rubi* (*Mycosphaerella rubi*),  
general; *S. darrowi*, NY.

POWDERY MILDEW. *Sphaerotheca macularis*, IL,  
IN, MN, OH, PA, Pacific Northwest.

ROSETTE; Double Blossom. *Cercospora rubi*,  
NC to AL, LA, MS, TX, IL.

ROT, Collar. *Rhizoctonia solani*, TX, WA.

ROT, Fruit. *Botrytis cinerea*; *Phyllosticta*  
*carpogena*, MD, NJ, NY, NC.

ROT, Root. *Armillaria mellea*, OR; *Collybia*  
*dryophila*, NC; *Corticium galactinum*,  
MD, VA, TX; *Helicobasidium purpureum*,  
NC, TX; *Phymatotrichum omnivorum*, TX.

RUST. *Gymnoconia peckiana*, orange (0, I, III),  
ME to VA, CA, MN, MO; *Kuehneola*  
*uredinis*, yellow (0, I, II, III), ME to FL, CA,  
KS, TX, WA; *Kunkelia nitens*, orange (I),  
CA, OR, CT to FL, IA, TX; *Mainsia rubi*  
(II, III), TX.

SPOT ANTHRACNOSE. *Elsinoë veneta*, general.

VIRUS. **Raspberry Beta Leaf Curl**, MI, OH, TX;  
**Raspberry Mosaic**, CT, MI, NJ, NY, Pacific  
Coast; **Loganberry Dwarf**, especially on  
loganberry, CA, OR, WA.

WILT. *Verticillium albo-atrum*, CA, OR, WA.

Use virus-free, bacterial-free, planting stock;  
spray for anthracnose.

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### Dianthus (Garden Pinks)

BLIGHT; Stem Rot. *Alternaria dianthi*,  
widespread.

BLIGHT, Gray Mold. *Botrytis cinerea*, AK.

BLIGHT, Southern. *Sclerotium rolfsii*, IL, TX.

LEAF, Blight. *Rhizoctonia solani*, LA.

LEAF SPOT. *Ascochyta dianthi*, NY, MS;  
*Heterosporium echinulatum*, CA, NY,  
OR; *Septoria dianthi*, AL, MI, MS, NJ, NY,  
NC.

NEMATODE, Root Knot. *Meloidogyne* sp., AL,  
MS, TX.

ROT, Bud. *Fusarium poae*, NY.

ROT, Root. *Phymatotrichum omnivorum*, TX;  
*Pythium ultimum*, CA.

ROT, Stem. *Rhizoctonia solani*, widespread.

RUST. *Puccinia arenariae*, NY; *Uromyces*  
*dianthi* (II, III), MS, NE, NY.

VIRUS. **Beet Curly Top**, CA; **Carnation latent**,  
NY.

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### Dichondra (Lawn-Leaf) Grass Substitute or Weed

BLIGHT, Southern. *Sclerotium rolfsii*, CA.

GALL, Leaf. *Synchytrium edgertonii*, LA.

NEMATODE, Root Knot. **Meloidogyne** sp., CA.  
 RUST. **Puccinia dichondrae** (II, III), LA, MS, NC, TX.  
 VIRUS. **Cucumber Mosaic**, CA.

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## Dieffenbachia

ANTHRACNOSE. **Glomerella cincta**, NJ;  
**Gloeosporium** sp., WA; **Colletotrichum**  
 sp., WA.  
 BACTERIAL Stem and Leaf Rot. **Erwinia dieffenbachiae**, FL.  
 LEAF SPOT. **Cephalosporium dieffenbachiae**,  
 FL, NY; **Leptosphaeria** sp., FL;  
**Myrothecium roridum**, FL.  
 ROT, Root. **Pythium splendens**, FL; **Rhizoctonia**  
 sp., FL.  
 ROT, Stem. **Phytophthora palmivora**, CA, FL.  
 ROT, Stem, Leaf, Cutting. **Fusarium solani**, FL.  
 Propagate from disease-free canes.

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## Diervilla (Bush Honeysuckle)

LEAF SPOT. **Cercospora weigeliae** (*C. diervillae*)  
 ME, TX; **Phyllosticta diervillae**, WI;  
**Ramularia diervillae**, ME, NH, NY, WI;  
**Septoria diervillae**, IA, MA, MN, WI.  
 NEMATODE, Root Knot. **Meloidogyne** sp.  
 POWDERY MILDEW. **Microsphaera alni**, NJ, WA.  
 ROT, Root. **Phymatotrichum omnivorum**, TX.  
 VIRUS. **Tobacco Ringspot**, MD.

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## Digitaria (Large Crabgrass)

ROT, Root. **Pythium arrhenomanes**, LA.

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## Dill (*Anethum*)

BACTERIAL, MLO. **Aster Yellows**, NY, TX.  
 BLIGHT. **Itersonilia perplexans**, CA.  
 DAMPING-OFF. **Rhizoctonia solani**, GA.  
 DODDER. **Cuscuta** sp., GA.

LEAF SPOT; Stem Spot. **Cercospora anethi**, ND,  
 OR, TX; **Phoma anethi**, CT, IN, IA.  
 ROT, Root; Wilt. **Fusarium** sp., OH;  
**Phymatotrichum omnivorum**, TX.  
 ROT, Stem. **Sclerotinia sclerotiorum**, TX.

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## Diodia

VIRUS. **Diodia Vein Chlorosis**, AR.

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## Dittany, Stonemint (*Cunila*)

LEAF SPOT. **Septoria cunilae**, IL.  
 RUST. **Puccinia menthae** (0, I, II, III), NY to VA,  
 AR, IL.

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## Dizygotheca

LEAF SPOT. **Alternaria panax**, CA.

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## Dodder (*Cuscuta*)

PHYTOPLASMA. **Citrus Greening**, FL.  
 VIRUS. **Tomato Ringspot**, PA.

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## Dodecatheon (Shooting-Star)

LEAF SPOT. **Heterosporium** sp., AK; **Phyllosticta dodecathei**, TX, WI.  
 RUST. **Puccinia melanconioides** (0, I, III), CA,  
 OR; **P. ortonii** (0, I, II, III), AK, CA, OR, SD,  
 UT, WA; **P. solheimi** (III) WY; **Uromyces acuminatus** var. **steironematis** (0, I), NE,  
 ND; II, III on marsh grasses.

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## Dogbane (*Apocynum*)

LEAF SPOT. **Cercospora apocyni**, north central  
 states, TX, VA; **Phyllosticta apocyni**, IA,  
 MS, NJ, NY, OR, PA, WI; **Septoria littorea**,

KS, MI, NE, ND, OH; *Stagonospora apocyni*, IL, IN, IA, NY, WI, VA.

ROT, Root. *Phymatotrichum omnivorum*, TX.

RUST. *Puccinia seymouriana* (0, I), IL, IN, KS, NE, NJ, NY, OK, SD; *P. smilacis* (0, I), IL, KS.

### Dogwood, Dwarf, Bunchberry (*Cornus canadensis*)

LEAF SPOT. *Ceratobasidium anceps*, rot, NH; *Discohainesia oenotherae*, also stem spot, ME, NH; *Phyllosticta* sp., NY; *Ramularia* sp., NY; *Septoria canadensis*, AK, ME, WA; *Glomerularia corni*, ME to WI, OR.

POWDERY MILDEW. *Phyllactinia corylea*, WA.

RUST. *Puccinia porphyrogenita* (III), ME to AK, WA.

### Dogwood, Flowering (*Cornus florida*)

ANTHRACNOSE. *Colletotrichum gloeosporioides*, TX; *Discula* sp., ID, OR, Pacific NW, MD; *D. destructive*, CT, GA, NC, TN.

BACTERIAL Crown Gall. *Agrobacterium tumefaciens*, MO.

BACTERIAL Leaf Blight. *Pseudomonas syringae*, TN.

BLACK MILDEW. *Dimerosporium pulchrum* and *Meliola nidulans*, Southeast.

BLIGHT, Flower and Leaf. *Botrytis cinerea*, MD, MA, NJ, NY, probably general in wet springs.

BLIGHT, Foliar. *Phytophthora parasitica*, FL; *P. sp.*, TN.

BLIGHT, Thread. *Pellicularia koleroga*, LA.

BLIGHT, Twig, Fruit Spot. *Colletotrichum acutatum*, CT, FL.

CANKER, Crown; Bleeding; Collar Rot. *Phytophthora cactorum*, MD, MA, NJ, NY, WA.

CANKER; DIEBACK. *Botryosphaeria ribis*, PA; *Cytospora* sp., NJ; *Cryptostictis*, NY; *Sphaeropsis* sp.

CANKER, Felt Fungus. *Septobasidium* spp., VA to FL, LA; *Cryptodiaporthe corni* Anamorph, *Myxosporium nitidum*, ND.

DAMPING-OFF. *Colletotrichum acutatum* and *Fusarium oxysporum*, GA.

LEAF SPOT. *Cristulariella pyramidalis*, FL; *Phyllosticta cornicola*, PA to VA, KS, TN; *Ascochyta cornicola*, NC, PA; *Cercospora cornicola*, NC to FL; *Septoria cornicola*, NY to GA, IA; *Colletotrichum gloeosporioides*, NY.

MISTLETOE. *Phoradendron serotinum* (*flavescens*), FL.

NEMATODE, Dagger. *Xiphinema americanum*.

NEMATODE, Lance. *Hoplolaimus uniformis*, RI.

NEMATODE, Sting. *Belonolaimus longicaudatus*, FL.

NONPARASITIC. Scorch. Water deficiency, frequent in Southeast.

POWDERY MILDEW. *Microsphaera alni*, MA to NC, IL, WI; *M. pulchra*, CT, SC; *Phyllactinia corylea*, general.

ROT, Root. *Armillaria mellea*, NY; *Clitocybe tabescens*, FL, GA; *Phymatotrichum omnivorum*, TX; *Corticium galactinum*, VA; *Pythium* sp.

ROT, Wood. *Daedalea confragosa*, MD, NC, PA, TN, VA, WV; *Daldinia vernicosa*, MD; *Lenzites betulina*, NC; *Polyporus* spp.; *Poria* spp., MD, PA.

SPOT ANTHRACNOSE. *Elsinoë corni*, DE, FL, GA, LA, MD, NC, SC, VA.

VIRUS. Tobacco Ring Spot, MD. Witches' Broom Disease, NJ; Dogwood Mosaic, SC.

WILT. *Verticillium* sp., MA.

The most serious dogwood disease in the East is crown or bleeding canker, which attacks trees after transplanting or injury. In a wet season spot anthracnose badly disfigures leaves, twigs, berries. In wet weather *Botrytis* blight is conspicuous as flowers fade and petals rot onto leaves.

### Dogwood, Pacific (*Cornus nuttalli*)

CANKER, Bleeding; Collar Rot. *Phytophthora cactorum*, WA.

CANKER, Trunk. *Nectria galligena*, OR, WA.

POWDERY MILDEW. *Phyllactinia corylea*, general.

ROT, Root. *Armillaria mellea*, WA; Heart, *Fomes ignarius*, OR.

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### Dogwood, Pagoda, Gray, Red Osier, Western Osier (*Cornus* spp.)

Most of the diseases listed for flowering dogwood occur on these shrub dogwoods.

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### Dolichos (Twinflower, Hyacinth Bean)

ANTHRACNOSE. *Colletotrichum dematium* f. sp. **truncata**, GA.  
 BLACK MILDEW. *Parodiella perisporioides*, NC.  
 LEAF SPOT. *Cercospora canescens*, FL.  
 NEMATODE, Root Knot. *Meloidogyne* spp., FL, SC.  
 POWDERY MILDEW. *Microsphaera euphorbiae*, IN.  
 ROT, Root. *Phymatotrichum omnivorum*, TX.  
 VIRUS. **Mosaic**, unidentified, MI; **Potato Virus X**, Work at Wisconsin on *Dolichos biflorus*, *D. lablab*.

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### Doronicum (Leopards-bane)

NEMATODE, Leaf. *Aphelenchoides* sp.  
 NEMATODE, Root Knot. *Meloidogyne* sp., CA, MD.  
 POWDERY MILDEW. *Golovinomyces cichoracearum*, CA.

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### Douglas-Fir (*Pseudotsuga*)

BACTERIAL Gall. *Agrobacterium pseudotsugae*, CA.  
 BLIGHT, Brown Felt. *Herpotrichia nigra*, Rocky Mts. and Pacific Northwest.  
 BLIGHT, Gray Mold; Snow Mold. *Botrytis cinerea*, cosmopolitan.  
 BLIGHT, Needle. *Rosellinia herpotrichioides*, CA.  
 BLIGHT. *Phoma eupyrena*, CA; *Phytophthora ramorum* (also small branch canker), CA.

BLIGHT, Seedling. *Rhizina undulata*, Pacific Northwest; *Fusarium oxysporum*, OR.  
 BLIGHT, Seedling Smother. *Thelephora terrestris*, Pacific Northwest.  
 BLIGHT, Snow. *Phacidium infestans*, ID.  
 CANKER, Bark. *Brunchorstia* (*Cryptosporium*) **boycei**, WA; *Chondropodium pseudotsugae*, OR; *Aleurodiscus* spp., weakly parasitic.  
 CANKER, Branch. *Dermea pseudotsugae*, CA.  
 CANKER, Branch, Trunk. *Dasyscyphus pseudotsugae*; *D. ellisiana*, twig, MA, NC, RI; *Phomopsis lokoyae*, Pacific Coast; *Cytospora* sp., twig, CO, NJ, OR; *Phaciopycnis* (*Phomopsis*) **pseudotsugae**; *Phomopsis lokoyae*, CA.  
 CANKER; DIEBACK. Collar Rot; Seedling Blight. *Diplodia pinea*, CA, KS, NJ, NY.  
 DAMPING-OFF. *Rhizoctonia solani*, cosmopolitan.  
 MISTLETOE; Witches Broom. *Arceuthobium douglasii*, MT to CO, OR, WA. *Phoradendron serotinum* (*flavescens*), TX.  
 NEEDLE CAST. *Adelopus gaeumannii*, Pacific states, Northeast; *Rhabdocline pseudotsugae*, general; *R. pseudotsugae* subsp. **pseudotsugae**, PA; *R. weirii*, PA; *Rhabdogloeum hydrophyllum*, AZ, NM.  
 NEEDLE CAST, Swiss. *Phaeocryptopus gaeumannii*, general, MN (also Lake states).  
 NEEDLE, Flyspeck. *Leptothyrium pseudotsugae*, CO.  
 NEMATODE, Ring. *Criconeimoides crotaloides*; *Meloidodera* sp., OR.  
 ROT, Heart, Wood. *Poria weirii*, destructive, OR, WA; *Echinodontium tinctorium*; *Fomes* spp.; *Polyporus* spp.; *Lenzites saepiaria*, wide-spread; *Stereum* spp.; *Trametes* spp.  
 ROT, Root. *Armillaria mellea*, cosmopolitan; *Sparassis radicata*, Pacific Northwest; *Phytophthora cinnamomi*, OR, WA, Southeast; *Phymatotrichum omnivorum*, TX; *Verticicladiella wagenarii*, CA, MT.  
 ROT, Root. *Armillaria mellea*, PA; *Fusarium solani*, PA; *F. oxysporum*, PA; *F. avenaceum*, PA.  
 ROT, Stem, Seedling. *Fusarium avenaceum*, OR; *sambucinum*, OR.

ROT, White Pocket. *Ganoderma oregonensis*, MT, OR, WA; *Hydnum coralloides*, Pacific Northwest.

RUST. *Melampsora albertensis* (0, I), MT to CO, UT, WA; II, III on poplar.

RUST, Leaf. *Melampsora medusae* f. sp. *deltoidae* (0, I), WA; II, III on poplar.

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### Draba (Whitlow-Grass)

DOWNY MILDEW. *Peronospora parasitica*, CO, IL, IA, KS, NE, SD, TX, WI.

RUST. *Puccinia aristidae* (0, I), AZ; *P. drabae* (III), AK, UT, WY; *P. holboellii* (0, III), CA, CO, UT; *P. monoica* (0, I), CA, NM.

WHITE RUST. *Albugo candida*, KS, WY.

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### Dracaena

ANTHRACNOSE. *Colletotrichum* sp., *Gloeosporium* sp., WA.

BACTERIAL, Leaf Spot. *Erwinia herbicola*, FL; *E. carotovora* pv. *carotovora*, FL.

BLIGHT, Tip. *Physalospora dracaenae*, WV; *P. rhodina*, MD.

LEAF SPOT; Tip Blight. *Glomerella cincta* (*Colletotrichum dracaenae*), general; *Phyllosticta dracaenae*, FL, NJ; *P. draconis*; *P. maculicola*; *Gloeosporium polymorphum* and *G. thuemenii*, wide-spread; *Lophodermium dracaenae*, black spot, CA.

NEMATODE, Lance. *Hoplolaimus bradys*, FL.

NEMATODE, Root Knot. *Meloidogyne* sp., FL.

NEMATODE, Sheath. *Hemicycliophora parvana*.

ROT, Stem. *Aspergillus niger* var. *floridanus*, FL.

VIRUS. **Tomato Spotted Wilt**, PA.

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### Dragonhead (*Dracocephalum*)

DOWNY MILDEW. *Peronospora* sp., WI, WY.

BLIGHT, Southern. *Sclerotium rolfsii*, IL, TX.

LEAF SPOT. *Phyllosticta dracocephali*, TX; *Septoria dracocephali*, TX, WI.

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### Duranta

BLIGHT, Seedling. *Sclerotium rolfsii*, FL.

LEAF SPOT, Black. *Phyllachora fusicarpa*, FL.

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### Dutchmans-Breeches, Squirrel-Corn (*Dicentra*)

DOWNY MILDEW. *Peronospora dicentrae*, IN, MD, MI, MO, NY, VA, WI.

RUST. *Cerotelium dicentrae* (0, I), NY to MD, KS, SD; II, III on wood-nettle.

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### Dutchmans-Pipe (*Aristolochia*)

BLIGHT, Gray Mold. *Botrytis cinerea*, CT, MD.

LEAF SPOT. *Cercospora guttulata*, IL, WV; *Gloeosporium* sp., MA; *Ovularia aristolochiae*, WV; *Phyllosticta aristolochiae*, NJ.

ROT, Root. *Diplodia radicola*, VA.

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### Dyschoriste

RUST. *Aecidium tracyanum* (0, I), FL.

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### Easter Cactus (*Rhipsalidopsis*)

ROT, Stem. *Drechslera cactivora* (*Helminthosporium cactivorum*), FL.

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### Echeveria

LEAF SPOT. *Stemphylium bolickii*, FL.

NEMATODE, Root Knot. *Meloidogyne* sp., CA.

RUST. *Puccinia echeveriae* (III), CA.

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### Echinacea (Purple Coneflower)

BACTERIAL, phytoplasma. **Aster Yellows**, WI.

BLIGHT, Wilt. *Fusarium oxysporum*, SD.

LEAF SPOT. *Cercospora rudbeckii*, IA; *Septoria lepachydis*, WI.

PHYLLODY, Phytoplasma, MD.

POWDERY MILDEW. *Golovinomyces cichoracearum*, Canada.

ROT, Root. *Phymatotrichum omnivorum*, TX.

ROT, Stem. *Sclerotinia sclerotiorum*.

VIRUS. Mosaic, unidentified, NY.

WILT. *Verticillium dahliae*, OR.

### **Echinochloa (Barnyardgrass)**

ROT, Root. *Pythium arrhenomans*, LA.

### **Eclipta**

BLIGHT. *Sclerotinia minor*, OK.

### **Eggplant (*Solanum melongena*)**

ANTHRACNOSE. *Colletotrichum* spp.; *Gloeosporium melongenae*, NJ to FL, IA, TX; *Glomerella cingulata*, IA.

BACTERIAL Canker. *Clavibacter michiganense*, WY.

BACTERIAL Soft Rot. *Erwinia carotovora*, NJ.

BACTERIAL Wildfire. *Pseudomonas syringae* pv. *tabaci*.

BACTERIAL Wilt. *Pseudomonas solanacearum*, general.

BLIGHT, Early. *Alternaria solani*, occasional, NY to FL, LA, WI.

BLIGHT, Late. *Phytophthora infestans*, FL, NY.

BLIGHT, Phomopsis; Fruit Rot. *Phomopsis vexans*, general.

BLIGHT, Southern. *Sclerotium rolfsii*, VA to FL, LA, WI.

DAMPING-OFF. *Pythium debaryanum*, CT, LA, NY; *Rhizoctonia solani*, also stem and fruit rot, general.

DODDER. *Cuscuta* spp., KS, NJ, PA, VA.

DOWNY MILDEW. *Peronospora tabacina*, SC.

FRUIT SPOT. *Diplodia natalensis*, FL; *Lasiodiplodia theobromae*, GA.

LEAF SPOT. *Ascochyta lycopersici*, DE, IL, IN, NY; *Cercospora melongenae*, CA; *Phyllosticta solani*, LA; *P. hortorum*, LA, NJ; *Septoria lycopersici*, IN, MD, NC, VA; *Stemphylium solani*, FL.

NEMATODE, Golden. *Globodera rostochiensis* (formerly, *Heterodera rostochiensis*).

NEMATODE, LESION. *Pratylenchus pratensis*, TX.

NEMATODE, Root Knot. *Meloidogyne hapla*; *M. incognita*; *M. javanica*.

NEMATODE, Tobacco Cyst. *Heterodera tabacum*, VA.

POWDERY MILDEW. *Golovinomyces cichoracearum*, NJ, VA.

ROT, Charcoal. *Macrophomina phaseoli*, NJ.

ROT, Collar. *Fusarium solani* f. sp. *eumartii*, CA.

ROT, Cottony Leak. *Pythium aphanidermatum*, CA, FL, TN.

ROT, Fruit. *Colletotrichum truncatum*, MS; *Phytophthora parasitica*, FL, IN; *Rhizopus stolonifer*, CA, IN, TX.

ROT, Gray Mold. *Botrytis cinerea*, CA, CT, MA, NJ, VA, WA.

ROT, Root. *Phymatotrichum omnivorum*, TX.

RUST. *Puccinia substriata* (I), AL, FL, GA, IA, TX.

VIRUS. Eggplant Mosaic; Cucumber Mosaic; Beet Curly Top, OR, TX, WA, Tomato Spotted Wilt.

WILT. *Fusarium* sp.; *Verticillium albo-atrum*, general.

Phomopsis blight and Verticillium wilt are the two most important eggplant diseases. Choose varieties resistant to blight and for wilt plant a long rotation, which does not include tomatoes, potatoes, or raspberries.

### **Elaeagnus (Russian-Olive, Silverberry)**

BACTERIAL Crown Gall. *Agrobacterium tumefaciens*, GA; Hairy Root, *A. rhizogenes*, IA.

BLIGHT, Southern. *Sclerotium rolfsii*, TX.

BLIGHT, Stem and Branch, Bark and Cambium Necrosis. *Botryodiplodia theobromae*, ND, SD, Southern Plains, NE, Great Plain states.

BLIGHT, Thread. *Rhizoctonia ramicola*, FL.

BLIGHT, Tip. *Gloeosporium fructigenum*.

CANKER. *Nectria cinnabarina*, CA; *Fusarium* sp., WY; *Phytophthora cactorum*, AZ, IL; *Fusicoccum elaeagni*, IL; *Tubercularia ulmea*, ND, SD.

CANKER, Phomopsis. *Phomopsis elaeagni*, (*Fusicoccum elaeagni*) DE, OH; *P. arnoldia* (syn. *P. elaeagni*), MI, ND, SD.

LEAF SPOT. *Cercospora carii*, TX; *C. elaeagni*, FL, MS, OK, TX; *Phyllosticta argyrea*, MD, NC; *Septoria argyrea*, IA, NE, ND, WI; *S. elaeagni*, KS.

MISTLETOE. *Phoradendron serotinum* (*flavescens*), FL.

POWDERY MILDEW. *Phyllactinia corylea*, OR; *P. elaeagni*, WY.

ROT, Root. *Clitocybe tabescens*, FL.

RUST. *Puccinia caricis-shepherdiae* (0, I), Northern Plains; II, III on *Carex*; *P. coronata* (0, I), MT, ND; II, III on *Calamagrostis*.

WILT. *Verticillium* sp., WA.

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### Elder (*Sambucus*)

BLIGHT, Thread. *Pellicularia koleroga*, LA; Web, *P. filamentosa*, FL.

CANKER, Branch. *Cytospora sambucicola*, IL; *C. chrysosperma*.

CANKER; DIEBACK. *Botryosphaeria ribis*, FL, GA; *Diplodia* spp.; *Nectria cinnabarina*, widespread; *N. coccinea*, MD, MI, WA; *Sphaeropsis sambucina*.

GALL, Leaf. *Synchytrium sambuci*, LA.

LEAF SPOT. *Ascochyta sambucina*, AK; *A. wisconsinia*, NY, WI; *Cercospora catenospora*, AL, KS, MS; *C. depazeoides*, general; *Cercospora prolifans*, CA, NM, OR; *Gloeosporium tineum*, MS, TX; *Phyllosticta sambuci*, MO, NY, WI; *Ramularia sambucina*, MO, NY, WI, WA; *Mycosphaerella* sp., NM; *Septoria sambucina*, VT to FL, CA, OR, TX, WA.

POWDERY MILDEW. *Microsphaera alni* and *M. grossulariae*, general; *Phyllactinia corylea*, MI; *Sphaerotheca macularis*, MA.

ROT, Heart, Wood. *Fomes ignarius*, ID; *Hymenochaete agglutinans*, WY; *Polyporus* spp.

ROT, Root. *Helicobasidium purpureum*, TX; *Phymatotrichum omnivorum*, TX; *Xylaria multiplex*, TX.

RUST. *Puccinia bolleyana* (0, I), ME to FL, MN, TX; II, III on *Carex*.

SPOT ANTHRACNOSE. *Sphaceloma* sp., LA.

VIRUS. Tobacco Mosaic.

WILT. *Verticillium albo-atrum*, MD.

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### Elderberry

VIRUS. Tobacco Ring Spot.

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### Elephants-Ear (*Colocasia*)

BACTERIAL Soft Rot. *Erwinia carotovora*, FL; *E. aroideae*, FL, TX.

BLIGHT, Southern. *Sclerotium rolfsii*, FL, NY.

LEAF SPOT. *Cladosporium colocasiae*, LA.

NEMATODE, Root Knot. *Meloidogyne* sp., FL, TX.

ROT, Black, of tuber. *Diplodia* sp., FL, SC, TX; Gray, *Fusarium solani*, FL, TX.

ROT, Root. *Pythium debaryanum*, CA.

VIRUS. Dasheen Mosaic, HI.

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### Eleusine (Goosegrass)

ROT, Root. *Pythium arrhenomanes*, LA.

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### Elm (*Ulmus*)

BACTERIAL, Leaf Scorch. *Xylella fastidiosa*, OK.

BACTERIAL, Leaf Spot. *Pseudomonas syringae*, PA.

BACTERIAL, MLO. Phloem Necrosis, AL, AR, GA, IL, IN, IA, KS, KY, MS, MO, NE, NJ, NY, OH, OK, PA, TN, WV.

BACTERIAL Wetwood. *Erwinia nimipressuralis*, VA, on Siberian elm (*Ulmus pumila*).

BACTERIAL Wetwood; Slime Flux. *Erwinia nimipressuralis*.



BLIGHT, Twig. **Septogloeum parasiticum**, MI; **Phomopsis oblonga**, MA; **Fusarium** spp.

BLIGHT, Twig. **Phomopsis oblonga**, VA, on Chinese elm (*Ulmus parvifolia*).

CANKER, Bleeding. **Phytophthora cactorum**, RI; Pit, **P. inflata**, CT, MA, NY, PA.

CANKER, Felt Fungus. **Septobasidium pseudopedicellatum**, NC.

CANKER, Stem. **Botryosphaeria ribis**.

CANKER, Twig. **Sphaeropsis ulmicola**, VA, on Chinese elm (*Ulmus parvifolia*).

CANKER, Twig Dieback. **Apioportha apiospora**, IA; **Coniothyrium** spp., IL, MA, MI; **Cytospora ludibunda**, CT, PA; **Nectria coccinea**, NJ, NY; **N. cinnabarina**, coral spot, widespread; **Phoma** sp., **Phomopsis** sp., Northeast to IL, MN, SC; **Sphaeropsis** sp., CT to MS; **Cytosporina ludibunda**, IL, KS.

DAMPING-OFF. **Rhizoctonia solani**, cosmopolitan; **Pythium** sp.

DIEBACK. **Cephalosporium** sp., VA, on English Elm (*Ulmus procera*).

LEAF BLISTER. **Taphrina ulmi**, CT to MS, MO, WI.

LEAF SPOT. **Cercospora sphaeriaeformis**, LA, TX; **Cylindrosporium tenuisporium**, TX; **Coryneum tumoricola**, NY; **Gloeosporium ulmicola**; **Monochaetia desmazierii**, GA; **Phyllosticta confertissima**, PA; **Mycosphaerella ulmi**, MA to AL; **Septogloeum profusum**, AL; **Coniothyrium ulmea**, WV; **Ceratophorum ulmicola**, KS, NE.

LEAF SPOT; Anthracnose. **Gloeosporium inconspicuum**, MA to VA; MN, OK.

LEAF SPOT; Black Spot. **Gnomonia ulmea**, general.

MISTLETOE. **Phoradendron serotinum (flavescens)**, IN, TX; **P. tomentosum**, TX.

MISTLETOE, European. **Viscum album**, CA.

NEMATODE, Dagger. **Xiphinema americanum**.

NEMATODE, Root Knot. **Meloidogyne** spp.

NEMATODE, Stem. **Ditylenchus gallicus**; Leaf, **Aphelenchoides fragariae**.

PHYTOPLASMA. **Elm Yellows**, NY.

POWDERY MILDEW. **Microsphaera alni**, IL, IA, MS, OH; **Phyllactinia corylea**, NC to TX, IA; **P. unguata**, GA; **Uncinula macrospora**, general.

ROT, Heart. **Collybia velutipes**, widespread; **Daedalea confragosa**, wide-spread; **Fomes** spp.; **Ganoderma curtisii**, NY.

ROT, Root. **Helicobasidium purpureum**, TX; **Phymatotrichum omnivorum**, TX; **Xylaria** spp.; **Armillaria mellea**, MO; **Clitocybe tabescens**, FL.

ROT, Wood. **Daldinia concentrica**, widespread; **Lenzites betulinum**, IN, MA, MD; **Pleurotus ostreatus**, widespread; **Polyporus** spp.; **Schizophyllum commune**, cosmopolitan; **Ustulina vulgaris**, MD.

WILT. **Dothiorella (Cephalosporium) ulmi**, general; **Verticillium albo-atrum**, ME to VA, MS, OR, WI.

WILT; Dutch Elm Disease. **Ceratocystis ulmi**, general.

The Dutch elm disease and phloem necrosis have taken a heavy toll of elms in many states. A dormant spray for the bark beetles that spread Dutch elmdisease is the present recommendation, combined with general sanitation. Chemotherapy is still promising but not yet practical. Some seedling elms are highly resistant but not immune.

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## Emilia (Tasselflower, Floras-Paintbrush)

RUST. **Puccinia emiliae**, FL.

VIRUS. **Cucumber Mosaic**, in part, FL; **Tomato Spotted Wilt**, CA; **Impatiens Necrotic Spot**, GA.

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## Encelia

NEMATODE, Root Knot. **Meloidogyne** sp., CA.

RUST. **Puccinia enceliae** (0, I, III), CA.

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## Endive, Escarole, Witloof Chicory (*Cichorium*)

BACTERIAL, Apical Rot. **Pseudomonas cichorii**, CA.

BACTERIAL Center Rot. **Pseudomonas cichorii** and **P. intybus**, AZ, CA, FL, MT, TX, WA.

BACTERIAL, Leaf Spot. *Pseudomonas cichorii*, FL; *P. syringae*, CA.

BACTERIAL, MLO. **Aster Yellows and California Aster Yellows.**

BACTERIAL Soft Rot. *Erwinia carotovora*, MA, NY.

BLIGHT, Southern. *Sclerotium rolfsii*, FL, TX.

DAMPING-OFF; Bottom Rot, Leaf Blight. *Rhizoctonia solani*, CA, CT, FL, NY, TX.

DOWNY MILDEW. *Bremia lactucae*, FL, PA.

LEAF SPOT. *Alternaria* sp., CA, CT, FL, NY; *Cercospora cichorii*, TX; *Marssonina panattoniana*, TX; *Ramularia cichorii*, NY.

NEMATODE, Root Knot. *Meloidogyne* sp., MA, NJ, TN.

NEMATODE, Sting. *Belonolaimus gracilis*.

NONPARASITIC. **Brown Heart.** Boron deficiency, in part, NJ, NY.

**Tipburn.** High temperature and excessive transpiration.

POWDERY MILDEW. *Golovinomyces cichoracearum*, ID, NJ, CA.

ROT, Crown Wilt. *Sclerotinia minor*, CA.

ROT, Gray Mold. *Botrytis cinerea*, CA, FL, NY, PA.

ROT, Root. *Pythium debaryanum*, CT, FL, NY, PA; *Phymatotrichum omnivorum*, AZ.

ROT, Watery Soft. *Sclerotinia sclerotiorum*, AZ, AR, CA, FL, LA, MT, PA, TX.

RUST. *Puccinia hieracii* (0, I, II, III), CA, CT, MA, NY.

SLIME MOLD. *Fuligo septica*, NJ.

VIRUS. **Mosaic**, unidentified, FL; **Tomato Spotted Wilt**; **Tomato Ringspot**, VT; **Tobacco Streak**, FL.

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### Engelmannia (Engelmann Daisy)

BROOMRAPE. *Orobanche ramosa*, TX.

GALL, Leaf. *Synchytrium taraxaci*, TX.

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### English Daisy (*Bellis perennis*)

BACTERIAL, MLO. **Aster Yellows**, NJ, NY.

BLIGHT, Gray Mold. *Botrytis cinerea*, AK.

LEAF SPOT. *Cercospora* sp., MN.

NEMATODE, Root Knot. *Meloidogyne* sp., FL.

ROT, Crown. *Sclerotinia sclerotiorum*, NJ.

ROT, Root. *Phymatotrichum omnivorum*, TX; *Pythium mastophorum*, MD.

RUST. *Puccinia lagenophorae*, CA.

VIRUS. **Tomato Spotted Wilt**, PA.

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### Epigaea (Mayflower, Trailing Arbutus)

LEAF SPOT. *Cercospora epigaeae*, NY, NC, WI; *Phyllosticta epigaeae*, MA, NY.

POWDERY MILDEW. *Microsphaera alni* var. *vaccinii*, CT to VA, WI.

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### Epilobium (Willow-Herb, Fireweed)

BACTERIAL, MLO. **California Aster Yellows**, CA.

BLIGHT, Gray Mold. *Botrytis cinerea*, AK.

BLIGHT, Southern. *Sclerotium rolfsii*, TX.

DOWNY MILDEW. *Plasmopara epilobii*, AK, IL, NY.

LEAF SPOT. *Cercospora montana*, widespread; *Discosia bubaki*, NY, WI; *Phyllosticta chamaeneri*, OR; *P. wyomingensis*, WY; *Ramularia cercosporoides*, AK, MT, TX, WA, WY; *Septoria epilobii*, CA, DE, IL, VT, WI.

NEMATODE, Root Knot. *Meloidogyne* sp.

POWDERY MILDEW. *Sphaerotheca macularis*, widespread; *Erysiphe polygoni*, WA; *Microsphaera* sp., IL.

ROT, Root. *Phymatotrichum omnivorum*, TX.

RUST. *Puccinia epilobii* (III), MI, WY; *P. dioicae* (0, I), CO; *P. gigantea* (III), ID, MT, TX, WA, WY; *P. scandica* (III), UT, WA, WY; *P. oenotherae* (0, I, II, III), CA; *P. pulverulenta* (0, I, II, III), ND to NM, CA; *P. veratri* (0, I), NH, MT to WA; *Pucciniastrum pustulatum* (II, III) widespread; 0, I on fir.

SMUT, Leaf. *Doassansia epilobii*, CO, NH.

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### Episcia

LEAF SPOT. *Myrothecium roridum*, FL.

VIRUS. **Tobacco Mosaic**, CA, CT, DC, FL, OH, WA.

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**Eranthemum**LEAF SPOT. *Phyllosticta* sp., NJ.

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**Erigeron (Fleabane)**BACTERIAL, MLO. *Aster Yellows*, KS, MD, MS, NJ, NY, OK.BLIGHT, Gray Mold. *Botrytis cinerea*, AK.BROOMRAPE. *Orobanche ramosa*, TX.DOWNY MILDEW. *Basidiophora entospora*, AL, IL; *Plasmopara halstedii*, IA, MD.GALL, Leaf. *Synchytrium erigerontis*, LA.LEAF SPOT. *Cercospora cana*, LA; *Cercospora colubrina*, WA; *Septoria erigerontis*, ME to MD, MI, NE.POWDERY MILDEW. *Golovinomyces cichoracearum*, CO, MI, MT, NM, PA, SD, WY; *Phyllactinia corylea*, WA; *Sphaerotheca macularis*, IN, KY.ROT, Stem. *Sclerotium rolfsii*, IL.RUST. *Puccinia cyperi* (0, I), MO; II, III on sedge; *P. dioicae* (0, I), East, South; *P. grindeliae* (III), CO, NV, UT, WY; *P. stipae* (0, I), CO, WY; *Coleosporium asterum* (II, III), CA, AK; 0, I on pine.SMUT, White. *Entyloma compositarum*, MI, ND, UT, WA, WI, WY.VIRUS. *Mosaic*, unidentified, IN.WILT. *Verticillium albo-atrum*, MA.

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**Eriophyllum**NEMATODE. *Meloidogyne* sp., CA.RUST. *Puccinia eriophylli* (II, III), WY, OR to CA; *Uromyces junci* (0, I), CA; II, III on *Juncus*.

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**Eryngium (Rattlesnake Master)**LEAF SPOT. *Cylindrosporium eryngii*, IA, KS, TX, WI; *Septoria eryngicola*, WI.ROT, Root. *Phymatotrichum omnivorum*, TX.ROT, Stem. *Macrophomina phaseoli*, OK.SMUT, White. *Entyloma eryngii*, IA.VIRUS. *Cucumber Mosaic*, OH.

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**Erythrina**BLIGHT, Thread. *Pellicularia koleroga*, FL; *Rhizoctonia ramicola*, FL.NEMATODE, Root Knot. *Meloidogyne* sp.ROT, Root. *Clitocybe tabescens*, FL; *Phymatotrichum omnivorum*, TX.RUST, Soybean. *Phakopsora pachyrhizi*, FL.WILT. *Verticillium albo-atrum*, CA.

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**Erythronium (Dogs-Tooth Violet, Adders-Tongue, Trout-Lily)**BLIGHT. *Botrytis* sp., IL, NY, VT, WA; *B. elliptica*, WA; *Ciborinia gracilis*, IL, NE; *C. erythronii*, NY.LEAF SPOT; Black Spot. *Asteroma tenerrimum* var. *erythronii*, ID, MT, WA.RUST. *Uromyces heterodermus* (0, III), CA, CO, ID, MT, OR, TX, UT, WA, WY.SMUT. *Ustilago heufferi*, DE, MD, MI, MO, NJ, NY, PA; *Urocystis erythronii*, CT, NY.

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**Erythroxyllum**WILT. *Fusarium oxysporum* f. sp. *erythroxyli*, HI.

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**Eucalyptus (Gum-Tree)**BACTERIAL Crown Gall. *Agrobacterium tumefaciens*, CA.BLIGHT, Seedling. *Fusarium oxysporum* f. sp. *aurantiacum*, CA.CANKER. *Diaporthe cubensis*, FL, HI, PR; *Lasiodiplodia pseudotheobromae*, *Neofusicoccum eucalyptorum*, *N. parvum*, *N. ribis*, Uruguay.CANKER; DIEBACK, Seed Capsule Abortion. *Botryosphaeria ribis*, FL.

CANKER, Felt Fungus. *Septobasidium curtisii*, NC.

LEAF SPOT. *Actinopelte dryina*, LA;  
*Mycosphaerella molleriana*, CA;  
*Phyllosticta extensa*, CA.

NONPARASITIC. Chlorosis. Iron deficiency, CA.

POWDERY MILDEW. *Golovinomyces cichoracearum*, AZ.

ROT, Heart; Wood. *Ganoderma applanatum*;  
*Polyporus* spp.; *Stereum hirsutum*.

ROT, Root. *Clitocybe tabescens*, FL; *Armillaria mellea*, CA; *Phymatotrichum omnivorum*, TX.

Many other fungi may be found on leaves, twigs, and branches but are not reported as causing specific diseases.

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### **Eucharis (Amazon-Lily)**

BLIGHT, Gray Mold. *Botrytis cinerea*, FL.

LEAF SCORCH; Red Blotch. *Stagonospora curtisii*, CA.

VIRUS. Tomato Spotted Wilt, PA.

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### **Eugenia**

BLACK MILDEW. *Asterinella puiggarii*, FL.

DIEBACK. *Fusicoccum*, *Neoscytalidium* and  
*Botryosphaeria*, FL.

LEAF SPOT. *Pezizella oenotherae*, NY.

ROT, Root. *Clitocybe tabescens*, FL.

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### **Euonymus (Burning-Bush, Spindle-Tree)**

ANTHRACNOSE. *Colletotrichum griseum*, AL, NJ, NY, GA to TX, AR; *Gloeosporium frigidum*, AR, MS.

BACTERIAL Crown Gall. *Agrobacterium tumefaciens*, CT, MI, MS, NJ, SC, TX.

BLIGHT, Thread. *Pellicularia koleroga*, LA.

DIEBACK, CANKER, Basal. *Whetzelinia sclerotiorum* (*Sclerotinia*), RI.

LEAF SPOT. *Cercospora destructiva*, VA to TX; *C. euonymi*, PA to WI; *Exosporium*

*concentricum*, AL, MS, SC, TX, VA; *Phyllosticta euonymi*, NY to MS and TX; *P. pallens*, AL; *Septoria euonymi*, MS, VA; *S. atropurpurea*, IL; *Ramularia euonymi*, CA, IA, KS, MO; *Marssonina thomasiana*, OH to WI, MO; *Myocentrospora* sp., OH.

NEMATODE, Root Knot. *Meloidogyne* sp., MD, TX.

POWDERY MILDEW. *Microsphaera alni*, NJ to SD and southward; *Oidium euonymi-japonici*, AL, CA, IA, LA, MS, NJ, SC, TX, WA.

ROT, Crown. *Phytophthora cactorum*.

ROT, Root. *Phymatotrichum omnivorum*, TX; *Fusarium scirpi*, NJ.

VIRUS. *Euonymus Mosaic*; Infectious Variegation, MA.

The Oidium mildew is prevalent throughout the South and in California. Crown gall is common, with conspicuous knobs along the vines, but seldom fatal.

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### **Eupatorium (Boneset, Blue Mist-flower, Dogfennel, White Snakeroot, Joe-Pye Weed)**

BLIGHT, Gray Mold; Canker. *Botrytis cinerea*, NJ. DOWNY MILDEW. *Plasmopara halstedii*, NY to MD, KS, MO, TX, WV, WI.

LEAF SPOT. *Ascochyta compositarum*, WV, WI; *Cercospora ageratoides*, AL, MS, NJ, TX, WV; *Phyllosticta decidua*; *P. eupatorina*, IL, NJ; *Septoria eupatorii*, IL, MD, MS, NJ, TX; *S. eupatoriicola*, IL.

NEMATODE, Root Knot. *Meloidogyne* sp., AL, FL; *M. hapla*.

POWDERY MILDEW. *Golovinomyces cichoracearum*, general in East to TX, MN.

ROT, Root. *Phymatotrichum omnivorum*, TX.

ROT, Stem. *Sclerotium rolfsii*, CT, IL, MD, NJ, TX; *Rhizoctonia solani*, NJ.

RUST. *Puccinia conoclinii* (II, III) MD to AL, IL, TX; *P. eleocharidis* (0, I), widespread in eastern and central states; II, III on *Eleocharis*; *P. tenuis* (0, I, III), MA to NC, MN, NE; *P. tolimensis* (III), NY.

SMUT, White. *Entyloma compositarum*, IL, IA, MS, WV, WI.

VIRUS. **Tobacco Ringspot**, MS; **Yellows**.  
Apparently distinct from Aster Yellows, central  
states; **Tomato Spotted Wilt**, GA.

WILT. **Fusarium** sp., NJ.

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## Euphorbia Trigona

ROT, Soft. **Rhizopus stolonifer**, CA.

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## Euryops

POWDERY MILDEW. **Podosphaera** (*Shaerotheca*)  
**jusca**, CA.

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## Eustoma (Prairie Gentian, Texas Bluebell)

BLIGHT, Stem. **Alternaria** sp., TX; **Sclerophoma**  
**eustomonis**, TX; **Phomopsis** sp., FL.

LEAF SPOT. **Cercospora eustomae**, CO, NE, TX;  
**C. nepheloides**, CA, TX; **Phyllosticta** sp., TX.

ROT, Crown. **Fusarium avenaceum**, CA;  
**Sclerotinia rolfsii**, FL.

VIRUS. **Cucumber Mosaic**, NY; **Impatiens**  
**Necrotic Spot**, FL; **Tomato Spotted Wilt**,  
PA; **Tomato Spotted Wilt – Impatiens Sero-**  
**type**, FL, GA.

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## Everlasting (*Antennaria*)

LEAF SPOT. **Phoma antennariae**, CO;  
**Phyllosticta antennariae**, DE, WI; **Septoria**  
**lanaria**, NY.

ROT, Stem. **Nectria haematococca**, CA.

WHITE RUST. **Albugo tragopogonis**, IL, NE.

WILT. **Nectria haematococca**, CA.

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## Evolvulus

ROT, Root. **Phymatotrichum omnivorum**, TX.

RUST. **Puccinia lithospermi** (0, I, II, III), CO, KS,  
NE, TX.

VIRUS. **Tobacco Streak**, WI.

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## Exacum

BLIGHT, Stem Canker. **Botrytis cinerea**, KS.

VIRUS. **Impatiens Necrotic Spot**, NC.

WILT. **Fusarium oxysporum** f. sp. **exaii**,  
CT.

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## Farkleberry, Tree-Huckleberry (*Vaccinium*)

CANKER, Felt Fungus. **Septobasidium sinuosum**,  
FL.

GALL, Leaf. **Exobasidium vaccinii**, AL, FL.

LEAF SPOT. **Cylindrosporium** sp., TX;  
**Ophiodothella vaccinii**, MD to GA, TX;  
**Pestalotia vaccinicola**, secondary, FL;  
**Phyllosticta vaccinii**, AL, FL, MS, TX;  
**Septoria albopunctata**, FL, SC, TX; Tar  
Spot, **Rhytisma vaccinii**, FL, OK, TX.

ROT, Root. **Phymatotrichum omnivorum**, TX.

VIRUS. **Blueberry Scorch**, British Columbia,  
Canada.

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## Feijoa (*Pineapple Guava*)

BLIGHT, Thread. **Rhizoctonia ramicola**, FL.

ROT, Fruit. **Botrytis cinerea**, CA;  
**Colletotrichum gloeosporioides**, CA;  
**Penicillium expansum**, CA.

ROT, Root. **Phymatotrichum omnivorum**,  
TX.

SPOT ANTHRACNOSE. **Sphaceloma psidii**, FL.

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## Fendlera

RUST. **Gymnosporangium speciosum** (0, I), CO  
and UT to NM, AZ; II, III on juniper.

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## Fennel (*Foeniculum*)

BACTERIAL Leaf Spot. **Pseudomonas syringae**,  
CA.

BACTERIAL Soft Rot. **Erwinia carotovora**, IL.

BLIGHT, Stem, Foliage. *Cercosporidium punctum*, CA.

DAMPING-OFF; Stem Pitting. *Rhizoctonia solani*, GA, NJ.

NEMATODE, Root Knot. *Meloidogyne* sp., FL.

ROT, Stem. *Sclerotinia sclerotiorum*, IL, NJ, TX; *Sclerotinia minor*, CA.

### Fenugreek (*Trigonella*)

BACTERIAL, Leaf Spot. *Pseudomonas syringae* pv. *syringae*, NJ.

DOWNY MILDEW. *Peronospora trigonellae*, CA.

### Fern, Adders-Tongue (*Ophioglossum*)

BLIGHT, Leaf. *Curvularia crepini*, OH.

### Fern, Aquatic (*Salvinia* spp.)

LEAF SPOT, Water-Soaked Lesions. *Rhizoctonia solani*, FL.

### Fern, Birds-Nest (*Asplenium*)

BACTERIAL Leaf Spot. *Pseudomonas asplenii*, CA.

BACTERIAL, Leaf Spot, Blights. *Pseudomonas gladioli*, FL.

LEAF SPOT. *Cercospora* sp., CA.

NEMATODE, Leaf. *Aphelenchoides fragariae*, CT, FL, NJ, NY, PA.

VIRUS. *Tomato Spotted Wilt*, PA.

### Fern, Bladder (*Cystopteris*)

LEAF BLISTER. *Taphrina cystopteridis*, IN, KS, WI.

RUST. *Hyalopsora polypodii* (II, III), general in North and West; *Uredinopsis ceratophora* (II, III), IN, NY, WI; *U. glabra* (II, III), NM.

### Fern, Boston (*Nephrolepis*)

ANTHRACNOSE; Tip Blight. *Glomerella nephrolepidis*, NY, OH.

BLIGHT, Gray Mold. *Botrytis cinerea*, AK.

DAMPING-OFF. *Rhizoctonia solani*, FL.

LEAF SPOT. *Cercospora* sp., IN; *Cylindrocladium pteridis*, FL; *Phyllosticta* sp., NY.

RUST. *Desmella superficialis*, FL.

### Fern, Bracken (*Pteridium*)

LEAF SPOT; Tar Spot; Black Mildew. *Phyllachora (Catacauma) flabellum*, GA, MD, NJ, PA, SC, TN, WV, WI; *Cryptomycina pteridis*, also leaf roll, widespread, reported under various conidial names; *Phyllosticta pteridis*, ME, NJ.

ROT, Canker. *Rhizoctonia* sp., including *Sclerotium deciduum*, OR, WI.

RUST. *Uredinopsis aspera* (II, III), CA; *U. macrosperma* (II, III), AL, CA, FL, GA, ID, MS, MT, NM, OR, WA, WI; *U. virginiana* (II, III), NY to NC and TN, GA to TX.

### Fern, Brake (*Pteris*)

BLIGHT, Tip. *Phyllosticta pteridis*, MS, NJ.

DAMPING-OFF. *Completozia complens*, NY; *Pythiumintermedium*, NY; *Trichothecium roseum*, IN.

NEMATODE, Leaf. *Aphelenchoides fragariae*, CT, NJ, NY.

### Fern, Christmas (*Polystichum*)

LEAF BLISTER. *Taphrina faulliana*, OR; *T. polystichi*, ME to NC, TN.

LEAF SPOT. *Cylindrocladium pteridis*, FL; Tar Spot, *Trabutiella filicina*, AK.

NEMATODE, Leaf. *Ditylenchus dipsaci*, OR; *Aphelenchoides fragariae*, OR, SC; Lesion, *Pratylenchus penetrans*, FL.

ROT, Root. *Phytophthora cinnamomi*, CA.  
RUST. *Milesia polystichi* (II, III), ID, MT, OR,  
WA; *M. vogesiaca* (II, III), OR.

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### Fern, Cliff-Brake (*Pellaea*)

RUST. *Hyalopsora cheilanthis* (II, III),  
CA, TX.

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### Fern, Holly (*Cyrtomium*)

BLIGHT, Gray Mold. *Botrytis cinerea*, AK.  
DAMPING-OFF. *Completozia complens* NY.  
VIRUS. **Yellows, Mosaic, Necrosis Ringspots,**  
**Holly Fern Mottle Virus**, LA, MS.

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### Fern, Japanese Climbing (*Lygodium japonicum*) Also – Old World Climbing (*Lygodium microphyllum*)

BLIGHT. *Colletotrichum gloeosporioides*, FL.  
LEAF SPOT. *Bioploairs sacchari*, FL.  
RUST. *Puccinia lygodii* (on Old World Climbing  
Fern), FL.

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### Fern, Lady, Silvery Spleenwort (*Athyrium*)

BLIGHT, Gray Mold. *Botrytis cinerea*, AK.  
LEAF SPOT. *Septoria asplenii*, MI.  
RUST. *Uredinopsis copelandii* (II, III), CA;  
*U. longimucronata* (II, III), ME to PA, WI;  
0, I on balsam fir; *U. longimucronata* f. sp.  
*cyclosora*, AK, CA, ID, MT, OR, WA; 0, I on  
alpine fir; *U. longimucronata* f. sp.  
*acrostichoides* (II, III), NH, NY, WI.

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### Fern, Leatherleaf (*Rumohra*)

ROT, Postharvest. *Rhizoctonia* sp., FL;  
*Cylindrocladium pteridis*, FL;  
*C. heptaseptatum*, FL.

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### Fern, Maidenhair (*Adiantum*)

LEAF SPOT. *Mycosphaerella* sp., FL;  
*Phytophthora ramorum*, CA.  
ROT. *Sclerotium deciduum* (*Rhizoctonia* sp.),  
WI.  
VIRUS. *Cucumovirus*, OH.

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### Fern, Osmunda (*Osmunda*; Cinnamon, Interrupted, and Royal Ferns)

LEAF BLISTER. *Taphrinia higginsii*, GA.  
LEAF SPOT. *Gloeosporium osmundae*, MI.  
NEMATODE, Foliar. *Aphelenchoides fragariae*, SC.  
RUST. *Uredinopsis osmundae* (II, III), northeast-  
ern and Great Lakes states, and to FL, and AL;  
0, I on balsam fir.  
SMUT, Inflorescence. *Mycosyrinx osmundae*,  
MI, NY, WI.

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### Fern, Ostrich (*Pteretis*)

LEAF BLISTER. *Taphrinia hiratsukae*, WI.  
ROT, Stem Necrosis. *Ceratobasidium anceps*  
(*Rhizoctonia*), WI.  
RUST. *Uredinopsis struthiopteridis* (II, III), NY,  
VT, WI; 0, I on balsam fir.

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### Fern, Polypody (*Polypodium*)

LEAF SPOT. *Alternaria polypodii*, secondary,  
NY; *Cercospora phyllitidis*, FL; *Phyllosticta*  
sp., VA.  
NEMATODE, Leaf. *Aphelenchoides fragariae*.  
RUST. *Milesia laeviuscula* (II, III), CA, and *M.*  
*glycyrrhiza*, AK, OR, WA; *M. polypodophila*  
(II, III), CT, ME, MA, NH, NY, PA, TN, VT.

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### Fern, Rock-Brake (*Cryptogramma*)

RUST. *Hyalopsora cheilanthis* (II, III), IA, MI,  
MT, WI; *Milesia darkeri* (II, III), CA, OR.

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**Fern, Sensitive (*Onoclea*)**

DODDER. *Cuscuta gronovii*, NY.

LEAF BLISTER. *Taphrinia filicina*, NY; *T. hiratsukae*, NY, PA.

RUST. *Uredinopsis mirabilis* (II, III), ME to VA, NE, MN; 0, I on balsam fir.

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**Fern, Tree (*Cibotium*)**

LEAF SPOT. *Pestalotia cibotii*, NJ.

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**Fern, Walking (*Camptosorus*)**

LEAF SPOT. *Cercospora camptosori*, WI.

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**Fern, Wood, Shield (*Dryopteris*)**

LEAF BLISTER, Gall. *Taphrina californica*, CA, OR; *T. filicina*, NY, PA; *T. fusca*, NJ, VT, WV; *T. gracilis*, NY; *T. lutescens*, ME, MN, NY, WI.

LEAF SPOT. *Cylindrocladium pteridis*, FL; Tar Spot, *Cryptomycina pteridis*, FL; *Herpobasidium filicinum*, white mold.

NEMATODE, Leaf. *Aphelenchoides fragariae*.

RUST. *Hyalopsora aspidiotus* (II, III), ME to NC, WA, WI; 0, I on balsam fir; *Milesia dilatata* (II, III), OR; *M. fructuosa* (II, III), ME, MA, NH, NY, VT; *M. marginalis* (II, III), MA, NH, VT; *Uredinopsis atkinsonii* (II, III), ME to MS, NE, ND; *U. phegopteridis* (II, III), ME, NH, WI; 0, I on balsam fir.

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**Fern, Rock (*Woodsia*)**

RUST. *Hyalopsora polypodii* (II, III), ID, MI; 0, I unknown.

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**Fern, Woodwardia, Chain (*Woodwardia*)**

RUST. *Uredinopsis arthurii* (II, III), VT to AL, IN, MI, and var. *maculata*, ME to AL; 0, I unknown.

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**Feverfew (*Chrysanthemum parthenium*)**

POWDERY MILDEW. *Golovinomyces cichoracearum*, NY.

ROT, Root and Stem. *Rhizoctonia solani*, WA.

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**Fig (*Ficus carica*)**

ANTHRACNOSE; Fruit Rot. *Colletotrichum gloeosporioides* (*Glomerella cingulata*), NC to TX.

BACTERIAL Crown Gall. *Agrobacterium tumefaciens*, CA, FL, TX.

BLIGHT, Limb. *Corticium salmonicolor*, Gulf states.

BLIGHT, Southern. *Sclerotium rolfsii*, FL.

BLIGHT, Thread. *Pellicularia koleroga*, FL, LA, MS; Web, *P. microsclerotia*, FL to LA, TX.

BLIGHT, Twig. *Gibberella baccata*, CA.

BLOTCH, Leaf. *Cercospora fici*, NC to FL, TX.

CANKER; DIEBACK. *Botryosphaeria ribis*; *Diplodia sycina*, NC, OR; *Macrophoma fici*, also fruit dry rot, LA, NC, TX; *Nectria cinnabarina*, TX; *Megalonectria pseudotrichia*, LA, TX; *Physalospora rhodina*, AL, FL, TX; *Sclerotinia sclerotiorum*, CA, TX.

CANKER, Felt Fungus. *Septobasidium* spp., MS.

CANKER, Phomopsis. *Phomopsis cinerescens*, CA.

LEAF SPOT. *Colletotrichum elastica*, FL; *Corynespora cassicola*, FL; *Ascochyta caricae*, CA; *Alternaria* sp., SC; *Cephalosporium acremonium*, LA; *Eutypa*



sp., TX; *Mycosphaerella bolleana*, NC to TX; *Ormathodium fici*, LA.

NEMATODE, Dagger. *Xiphinema index*, CA.

NEMATODE, Fig Cyst. *Heterodera fici*, CA.

NEMATODE, Lesion. *Pratylenchus vulnus*, *P. musicola* and *P. pratensis*, CA.

NEMATODE, Pin. *Paratylenchus hamatus*, CA.

NEMATODE, Root Knot. *Meloidogyne* spp., southern states to CA.

NONPARASITIC. **Chlorosis**. Manganese deficiency, FL.

**Little Leaf**. Zinc deficiency, CA.

**Sunburn**. Low temperature injury to trunk and branches, CA.

ROT, Fruit. *Alternaria tenuis*, in market; *Aspergillus niger*, black mold; *Botrytis cinerea*; *Choanephora cucurbitarum*, TX; *Cladosporium herbarum*, market; *Diplodia natalensis*, TX; *Fusarium moniliforme*, CA; *Oospora* sp., sour rot, TX; *Rhizopus nigricans*, CA, Gulf states; *Trichothecium roseum*, Gulf states.

ROT, Root. *Armillaria mellea*, CA; *Dematophora necatrix*, NC; *Phymatotrichum omnivorum*, TX; *Rhizoctonia* sp., TX.

RUST. *Cerotelium (Physopella) fici* (II, III), NC to FL, AR, TX.

SOOTY MOLD. *Capnodium* sp., TX; *Fumago vagans*, Gulf states.

VIRUS. **Fig Mosaic**, AZ, CA, GA, TX, VA.

WILT, Branch. *Hendersonula toruloides*, CA.

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### Fig, Florida Strangler (*Ficus aurea*)

ANTHRACNOSE. *Colletotrichum gloeosporioides*, FL.

BACTERIAL Crown Gall. *Agrobacterium tumefaciens*, FL.

LEAF SPOT. *Ophiodothella fici*, FL; *Phlyctema ficuum*, FL; *Phyllosticta physopellae*; *P. roberti*, FL.

NEMATODE, Root Knot. *Meloidogyne* spp.

ROT, Fruit. *Fusarium moniliforme*, CA.

RUST. *Cerotelium fici* (II, III), FL.

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### Figwort (*Scrophularia*)

DOWNY MILDEW. *Peronospora sordida*, CA, IL, NY, VA to KS.

LEAF SPOT. *Cylindrosporium scrophulariae*, IL, OK, PA; *Mycosphaerella* sp., KS; *Septoria scrophulariae*, CA, CO, OR, WA, NY to MS.

VIRUS. **Figwort Mosaic**.

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### Filaree, Red-Stem (*Erodium cicutarium*)

NEMATODE, Lesion. *Pratylenchus minyus*, CA.

VIRUS. **Filaree Red Leaf**, CA.

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### Filbert

► Hazelnut.

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### Fir (*Abies*)

BLACK MILDEW. *Dimerosporium abietis*, ID, OR, WA; *Adelopus nudus*, ME, NY, NC, WI.

BLIGHT. *Phoma eupyrena*, CA.

BLIGHT, Brown Felt. *Herpotrichia nigra*, on high western firs.

BLIGHT, Needle. *Acanthostigma parasiticum*; *Rehmiellopsis balsameae*, Northeast; *Cenangium ferruginosum*, MI, PA; *Rhabdogloeum abietinum*, NC; *Macrophoma parca*, CO, ID, MT, OR, WA; *Phoma eupyrena*, CA; *Furcaspora pinicola*, CA; *Phyllosticta multicorniculata*, NH.

BLIGHT, Needle and Branch. *Phytophthora capsici*, MI.

BLIGHT, Seedling Smother. *Thelephora terrestris*.

BLIGHT, Snow. *Phacidium infestans*, Northeast; *P. balsameae*; *P. abietinellum*.

BLIGHT, Tip. *Delphinella balsameae*, VT.

CANKER. *Aleurodiscus amorphus*, general; *Cytospora pinastri*, ME, WI; *C. cylindroides* and *C. abietis*, OR, WA; *Cephalosporium* sp., MN, WI; *Cryptosporium*

- macrospermum**, New England; **Dasyscyphus resinaria**, MN; **Nectria fuckeliana**, CA, OR; **N. balsameae**, NC, PA; **Phomopsis boycei**, ID, MT; **P. fokoyae**, CA.; **P. montanensis**; **Ophionectria scolecospora**, widespread; **Scleroderris abieticola**, OR; **Sphaeropsis abietis**, MI; **Valsa (Cytospora) kunzei**; **Thyronectria balsamea**, CO.
- CANKER, Pitch. **Fusarium circinatum**, CA.
- DIEBACK, Twig. **Sydowia polyspora**, CA.
- MISTLETOE. **Arceuthobium americanum**, WA; **A. campylopodium**, widespread in West; **A. douglasii**, NM, OR, WA; **A. laricis**, WA; **Phoradendron pauciflorum**, AZ, CA.
- NEEDLE CAST; Blight. **Bifusella abietis**, ID, MT, WA; **B. faullii**, ME, MI, NH; **Hypoderma robustum**, CA, ID, OR, WA; **Hypodermella abietis-concoloris**, widespread on western firs; **H. mirabilis**, MI; **H. nervata**, ME, NH, VT; **H. punctata**, ID, OR; **Lophodermium piceae**, tar spot, widespread, weakly parasitic; **L. autumnale**, CA, ID, MI, OR, UT, WY; **L. consciatum**; **L. decorum**; **L. uncinatum**; **L. lacerum**, NH, NY, PA, VT.
- NEEDLE CAST; Blight. **Tirula nervisequa conspicuus**, CA.
- NEMATODE. **Nacobbodera chitwoodi**, OR.
- ROT, Heart. **Stereum sanguinolentum**, widespread; **Polyporus sulphureus**, general.
- ROT, Crown. **Phytophthora cactorum**, VA.
- ROT, Hypocotyl. **Fusarium oxysporum**, CA.
- ROT, Root. **Armillariamellea**, New England, NY; **Fusarium solani**, PA; **F. oxysporum**, PA; **F. avenaceum**, PA; **Phytophthora cinnamomi**, NC; **P. capsici**, MI; **P. citricola**, NC; **P. drechsleri**, NC; **P. ramorum**, CA; **Verticicladiella wagnerii**, Pacific Coast; **Poria weirii**, OR.
- ROT, Wood. **Coniophora puteana**, New England, NY; **C. corrugis**, AZ, CO, WY; **Fomes annosus**, CO; **Echinodontium tinctorium**; **Hydnumabietis**; **H. balsameum**; **Polyporus** spp.; **Poria** spp.
- RUST, Fir-Broom. **Melampsorella caryophyllacearum**, NY.
- RUST, Fir-Fern. **Milesia fructuosa** (0, I) on new needles, ME, NH, NY; II, III on *Dryopteris*; **M. marginalis**, MA, NH, NY; **M. polypodophila** (0, I), ME, NH, NY, on old needles; II, III on *Polypodium*, **Hyalopsora aspidiotus** (0, I), on 2-year needles; II, III on *Dryopteris*; **Uredinopsis mirabilis** (0, I), general; II, III on sensitive fern; **U. osmundae** (0, I), widespread; II, III on *Osmunda*; **U. struthiopteridis**, ID, MI, OR, WA; II, III on ostrich-fern; **U. phegopteridis** (0, I); II, III on *Dryopteris*.
- RUST, Fir-Fireweed. **Pucciniastrum pustulatum**, widespread; II, III on *Epilobium*.
- RUST, Fir-Huckleberry. **Pucciniastrum goeppertianum**, widespread on western firs, and ME, PA, WI; II, III on *Vaccinium*.
- RUST, Fir-Willow. **Melampsora abieticapraearum**, widespread; II, III on willow.
- RUST, Needle. **Caecoma faulliana**, OR; **Peridermium ornamentale**, ID, MT, OR, WA; **P. rugosum**, CA, OR, WA.
- RUST, Witches' Broom. **Melampsorella cerastii**, general; II, III on chickweed.
- WILT, Dieback. **Phytophthora ramorum**, CA.
- Despite this long list of possibilities the gardener should not have much trouble with ornamental firs. *Rehmiellopsis* tip blight yellows needles of new growth and causes twig dieback of native balsam firs in the Northeast but can be controlled with copper sprays, which will also aid in preventing needle-cast diseases. Avoid bark and branch injuries that induce cankers. Rust is taken care of, if necessary, by eliminating the proper alternate host, but only a specialist can identify the many different rust species.
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- Firecracker Plant (*Crossandra infundibuliformis*)**
- VIRUS. **Alternanthera Mosaic**, FL, MD, PA.
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- Firethorn**
- *Pyracantha*.

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**Fittonia**

BLIGHT, Leaf. *Rhizoctonia* sp., OH.  
LEAF SPOT. *Myrothecium roridum*, FL.

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**Flax, Flowering (*Linum*)**

DAMPING-OFF. *Rhizoctonia solani*, IL.  
NEMATODE, Root Knot. *Meloidogyne* sp., CA.  
ROT, Stem. *Sclerotinia sclerotiorum*, CA.

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**Florida Pusley (*Richardia scaba*)**

VIRUS. Tomato Spotted Wilt, GA.

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**Foam-Flower (*Tiarella*)**

POWDERY MILDEW. *Sphaerotheca macularis*, AK.  
RUST. *Puccinia heucherae* (III), CT to NC, AK, CA, CO, ID, MI, MT, OR, TN, WA, WI.

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**Forestiera (Swamp-Privet)**

MISTLETOE. *Phoradendron serotinum* (*flavescens*), TX.  
POWDERY MILDEW. *Microsphaera alni*, IL, TX.  
ROT, Root. *Phymatotrichum omnivorum*, TX.  
RUST. *Coleosporium minutum* (II, III), FL, TX; 0, I on pine; *Puccinia peridermiospora* (0, I), FL, TX; II, III on marsh grass.

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**Forget-Me-Not (*Myosotis*)**

BACTERIAL, MLO. California Aster Yellows, CA.  
BLIGHT, Gray Mold. *Botrytis cinerea*, cosmopolitan.  
DOWNY MILDEW. *Peronospora myosotidis*, IL, MI, MS, WI.  
LEAF SPOT. *Stemphylium* sp., NY.

POWDERY MILDEW. *Golovinomyces cynoglossi* (*Erysiphe cynoglossi*), WA.

ROT, Crown. *Sclerotinia sclerotiorum*, IL, WA.  
RUST. *Puccinia eatoniae* var. *myosotidis* (0, I), IL, IN, MS, MO, NC, WI; II, III on *Sphenopholis*; *P. mertensiae* (III), CO.

VIRUS. Chlorosis, GA. Perhaps eastern strain of Aster Yellows.

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**Forsythia (Goldenbells)**

ANTHRACNOSE. *Gloeosporium* sp., OK.  
BACTERIAL Grown Gall. *Agrobacterium tumefaciens*, MS, NJ, TX.  
BLIGHT, Cane. *Botryosphaeria ribis*.  
BLIGHT, Southern. *Sclerotium rolfsii*, GA.  
BLIGHT, Twig. *Sclerotinia sclerotiorum*, NC; *Phytophthora nicotianae*, VA.  
CANKER, Stem Gall. *Phomopsis* sp., KY.  
LEAF SPOT. *Alternaria* sp., IA; *Phyllosticta discincola*, MD.  
NEMATODE, Lesion. *Pratylenchus vulnus*.  
NEMATODE, Root Knot. *Meloidogyne* sp., TX; *M. hapla*; *M. incognitaacrita*.  
ROT, Root. *Phymatotrichum omnivorum*, TX.  
VIRUS. Tobacco Ring Spot, MD.

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**Fouquieria (Ocotillo, Candlewood)**

ROT, Root. *Phymatotrichum omnivorum*, TX.  
RUST. *Aecidium cannonii* (0, I), AZ.

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**Four-O'Clock (*Mirabilis*)**

BACTERIAL, Blight. *Xanthomonas campestris* pv. *campestris*, CA.  
LEAF SPOT. *Cercospora mirabilis*, TX.  
NEMATODE, Root Knot. *Meloidogyne* sp., FL.  
ROT, Root. *Phymatotrichum omnivorum*, TX.  
RUST. *Aecidium mirabilis* (0, I), AZ, NM; *Puccinia aristidae* (0, I), AZ.

**VIRUS. Beet Curly Top**, CA; **Mirabilis Mosaic**, IL.  
**WHITE RUST. Albugo platensis**, TX.

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### **Foxglove (*Digitalis*)**

**ANTHRACNOSE. Colletotrichum fuscum**, CT, MA, OR, PA, WI.  
**BLIGHT, Leaf; Inflorescence. Alternaria** sp., MD.  
**DOWNY MILDEW. Peronospora digitalidis**, CA.  
**LEAF SPOT. Cladosporium** sp., NJ; **Phyllosticta digitalis**, AK, NY, TX; **Ramularia variabilis**, OR.  
**NEMATODE, Leaf and Stem. Ditylenchus dipsaci**, CT.  
**NEMATODE, Root Knot. Meloidogyne** spp., CA, MD.  
**ROT, Root and Stem. Rhizoctonia solani**, NJ; **Fusarium** sp., CA, NH.  
**ROT, Stem; Wilt. Sclerotinia sclerotiorum**, NY; **Sclerotium rolfsii**, IN, NJ, TX.  
**VIRUS. Tobacco Mosaic**, WI; **Tomato Spotted Wilt**, PA; **Tomato Spotted Wilt-Impatiens Serotype**, FL, GA.  
**WILT. Fusarium** sp., CA, NH; **Verticillium albo-atrum**, NY.

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### **Freesia**

**BACTERIAL Scab. Pseudomonas marginata**, occasional in imported stock.  
**LEAF SPOT. Heterosporium iridis**, CT.  
**NEMATODE, Root Knot. Meloidogyne** sp., CA.  
**ROT, Corm Wilt. Fusarium** spp., including **F. oxysporum**; **F. solani**, CA, FL, TX.  
**ROT, Dry. Stromatinia gladioli**, NJ, NY. **ROT. Blue Mold. Penicillium gladioli**.  
**RUST. Cause unknown, not true rust.**  
**VIRUS. Iris Mosaic**, CA; **Bean Yellow Mosaic; Freesia Sneak**, VA.  
 Fusarium corm rot causes wilting and death. Corms should be inspected before planting, and all those showing pinkish lesions should be discarded.

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### **Freeway Daisy (*Osteospermum*)**

**VIRUS. Lettuce Mosaic**, CA.

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### **Fremontia (Flannel Bush)**

**LEAF SPOT. Ascochyta fremontiae**, CA.  
**ROT; Stem Girdle. Phytophthora cactorum**, CA.  
**ROT, Crown, Root. Phytophthora nicotianae** var. **nicotianae**, CA.  
**WILT. Verticillium albo-atrum**, CA.

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### **Fringe-Tree (*Chionanthus*)**

**ANTHRACNOSE. Discola fraxinea**, DE.  
**LEAF SPOT. Cercospora chionanthi**, NJ to NC, WV; **Phyllosticta chionanthi**, NJ, WV; **Septoria chionanthi** and **S. eleospora**, SC, TX.  
**POWDERY MILDEW. Phyllactinia corylea**, MD.  
**ROT, Root. Phymatotrichum omnivorum**, TX.  
**ROT, Wood. Daedalea confragosa**, MD.

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### **Fritillaria**

**LEAF SPOT. Phyllosticta fritillariae**, CA.  
**RUST. Uromyces miurae** (III), AK, WA.  
**VIRUS. Mosaic. Undetermined**, NY.

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### **Froelichia**

**LEAF SPOT. Cercospora crassoides**, OK, TX, WI.  
**NEMATODE, Root Knot. Meloidogyne** sp., FL.  
**ROT, Root. Phymatotrichum omnivorum**, TX.  
**WHITE RUST. Albugo froelichiae**, NE, TX.

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### **Frostwort (*Crocantemum*)**

**LEAF SPOT. Cylindrosporium eminens**, WI.

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## Fuchsia

- BLIGHT, Gray Mold. *Botrytis cinerea*, AK, WV.  
 DIEBACK. *Phomopsis* sp., VA.  
 LEAF SPOT. *Septoria* sp., OK.  
 NEMATODE, Root Knot. *Meloidogyne* sp.  
 ROT, Mushroom Root. *Armillaria mellea*, CA.  
 ROT, Root. *Pythium rostratum*; *P. ultimum*, CA; *Phytophthora parasitica*, OR; *Thielaviopsis* sp., OR.  
 RUST. *Pucciniastrum epilobii*, NC, OR; *Uredo fuchsiae* (II), OH.  
 VIRUS. **Tomato Spotted Wilt**, CA; **Cucumber Mosaic**, MN.  
 WILT. *Verticillium albo-atrum*, CA.  
 Verticillium wilt is common in garden plantings of fuchsia in California.

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## Gaillardia (Blanket Flower)

- BACTERIAL, MLO. **Aster Yellows**, NJ, NY, PA, and **California Aster Yellows**, CA.  
 LEAF SPOT. *Septoria gaillardiae*, IA, OK, TX.  
 NEMATODE. *Nacobus batatiformis*, NE.  
 POWDERY MILDEW. *Golovinomyces cichoracearum*, MT, OK, TX; *Sphaerotheca macularis*, MT, WA, WY; *Leveillula taurica*, WA.  
 ROT, Crown and Stem. *Sclerotinia sclerotiorum*, CA.  
 ROT, Root. *Phymatotrichum omnivorum*, TX; *Pythium ultimum*, CA.  
 RUST. *Coleosporium asterum* (II, III), CA; 0, I on pine; *Puccinia gaillardiae* (0, I), CA, II, III unknown.  
 SMUT, White. *Entyloma polysporum*, KS, MN, NE, VA.  
 VIRUS. **Tomato Spotted Wilt**, CA; **Bidens Mottle**, FL.

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## Galax

- LEAF SPOT. *Clypeolella leemingii*, black spot, MD to GA, MS; *Discohainesia oenotherae*, NC; *Phyllosticta galactis*, NC, VA, WV.

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## Galium (Bedstraw)

- DODDER. *Cuscuta cuspidata*, TX.  
 DOWNY MILDEW. *Peronospora calotheca*, IA, ND, WI.  
 LEAF SPOT. *Cercospora galii*, AL, AK, IA, NH, NY, OR; *Pseudopeziza repanda*, CA, CT, GA, IL, IA, NY, ND, OR, WI; *Melasmia galii*, IA; *Septoria cruciatae*, IN, MI, NJ, NY, WV, WI.  
 POWDERY MILDEW. *Golovinomyces cichoracearum*, CA, MT, OR, PA, WA; *Erysiphe polygoni*, KS.  
 ROT, Root. *Phymatotrichum omnivorum*, TX.  
 RUST. *Puccinia difformis* (0, I, III), OH to KS, MT, Pacific Coast; *P. punctata* (0, I, II, III); CT, MS, NC, ND to CA, WA; *P. punctata* var. *troglodytes* (0, I), CT to MO, SD, WA; *P. rubefaciens* (III), AK, IA, WI to CA, WA; *Pucciniastrum galii*, NY, PA to CA, CO, and OR; *Uromyces galii-californici* (II, III), CA.

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## Galtonia (Summer-Hyacinth)

- VIRUS. **Ornithogalum Mosaic**, OR.

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## Gardenia (Cape-Jasmine)

- BACTERIAL Leaf Spot. *Xanthomonas maculifolium-gardeniae*, CA.  
 BLIGHT, Bud Rot. *Botrytis cinerea*, in greenhouses; outdoors in CA.  
 CANKER, Stem Gall. *Phomopsis (Diaporthe) gardeniae*, CA, widespread in greenhouses, outdoors in CA, FL.  
 LEAF SPOT. *Myrothecium roridum*, PA; *Pestalotia langloisii*, AL, FL; *Phyllosticta* sp., MS, NJ, TX; *Rhizoctonia* sp., NJ; *Mycosphaerella gardeniae*, GA.  
 LEAF SPOT, Algal. *Cephaleuros virescens*, Gulf states.  
 NEMATODE, Burrowing. *Radopholus similis*, FL.  
 NEMATODE, Reniform. *Rotylenchulus reniformis*.

NEMATODE, Root Knot. *Meloidogyne hapla*; *M. incognita*; *M. javanica*; general; *M. arenaria*, NC.

NEMATODE, Spiral. **Helicotylenchus nannus**.

NONPARASITIC. **Bud Drop**. Excessive soil moisture; temperature fluctuation.

**Chlorosis**. Soil too alkaline or soil temperature too low.

**Dieback**. Yellow veinbanding, defoliation from root smothering by overwatering.

POWDERY MILDEW. **Erysiphe polygoni**, TX.

ROT, Root. **Phymatotrichum omnivorum**, TX

SOOTY MOLD. **Capnodium** spp., Gulf states.

In the deep South gardenia foliage is disfigured with sooty mold growing in whitefly honeydew. Gardenias are difficult house plants, dropping buds with uneven humidity and temperature. To control Phomopsis canker take cuttings near top of plants. Substitute the more resistant Veitchii variety for susceptible Belmont and Hadley. Avoid syringing, which spreads bacterial leaf spot.

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## Garlic (*Allium sativum*)

► Onion.

ROT, White. **Sclerotium cepivorum**, ME.

RUST. **Puccinia allii**, OR; on wild garlic, CA.

VIRUS. **Onion Yellow Dwarf, Leak Yellow Stripe, Garlic Common Latent**, OR, WA, Argentina; **Leaf Yellow Strip, Mosaic, Dwarfism**, Guanajuato, Mexico; **Leaf Yellow Strip Virus, Iris Yellow Spot and Irish Yellow Spot Virus**, OR, WA; **Japanese Garlic Virus** (Virus B and D), Pacific Northwest; **Shallot Latent**, Brazil.

Subject to diseases of onion. White rot is serious in Louisiana; pink root is a common problem. Clove rot is caused by *Penicillium digitatum*.

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## Garrya (Tassel-Tree, Silk-Tassel Bush)

LEAF SPOT. **Cercospora garryae**, CA, TX; **Phyllosticta garryae**, CA, TX; **Dothichiza garryae**, CA.

ROT, Root. **Phymatotrichum omnivorum**, TX.

SOOTY MOLD. **Lembosia lucens**, CA.

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## Gaultheria (Checkerberry, Teaberry) (Source of Oil of Wintergreen)

BLOTCH, Sooty. **Gloeodes pomigena**, WI.

FRUIT SPOT; Black Speck. **Leptothyrella pomi**, WI; **Schizothyrium gaultheriae**, ME to VA, WI.

LEAF SPOT. **Cercospora gaultheriae**, NJ, WI; **Discohainesia oenotherae**, VA; **Mycosphaerella gaultheriae** (*Phyllosticta gaultheriae*), general; **Venturia arctostaphyli**, MD, MA, NJ, NY, VA.

POWDERY MILDEW. **Microsphaeraalni**, MD.

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## Gaura

BACTERIAL, MLO. **California Aster Yellows**, CA.

BROOMRAPE. **Orobanche ramosa**, TX.

DOWNY MILDEW. **Peronospora arthuri**, KS, NE.

GALL, Leaf. **Synchytrium fulgens**, TX.

LEAF SPOT. **Cercospora gaurae**, NY, OK, TX; **Septoria gaurina**, IL, KS, NE, ND, OK, TX.

POWDERY MILDEW. **Erysiphe polygoni**, CO, TX.

ROT, Root. **Phymatotrichum omnivorum**, TX.

RUST. **Puccinia extensicola** var. **oenotherae** (0, I), CO, NE, TX; II, III on *Carex* spp.; **Uromyces plumbarius** (0, I, II, III), NY to VA, TX, WI, ND and MT to MS, NM.

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## Gazania

ROT, Crown. **Rhizoctonia solani**, CA; **Sclerotinia sclerotiorum**, LA.

VIRUS. **Lettuce Mosaic**, CA; **Tomato Spotted Wilt-Lettuce Serotype**, GA.

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### Gazania (Treasure Flower)

ROT, Crown. *Sclerotinia sclerotiorum*, LA.

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### Genista (Wood-waxen)

DIEBACK. *Diplodia* sp., CA, NJ.

LEAF SPOT. *Pleiochaeta setosa*, OR.

POWDERY MILDEW. *Erysiphe polygoni*, MO.

RUST. *Uromyces genistae-tinctoriae* (II, III), CA.

RUST, Soybean. *Phakopsora pachyrhizi*, Southern U.S.

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### Gentian (*Gentiana*)

BLIGHT, Stem Canker. *Botrytis cinerea*, NY.

LEAF SPOT. *Asteromella andrewsii* (*Mycosphaerella andrewsii*), DE, IL, IA, NE, NJ, D, PA, WV, WI; *Cercospora gentianae*, NY, ND, VT; *C. gentianicola*, DE, WI.

ROT, Root. *Fusarium solani*, MD.

RUST. *Puccinia gentianae* (0, I, II, III), NY to IN, NE, MN; western states to AK, CA, WA; *P. haleniae*, WY; *Uromyces gentianae* (II, III), CO, IA, NV, NM, NC, VT, WA, WY; *Pucciniastrum alaskanum*, AK.

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### Geranium (*Pelargonium*)

BACTERIAL Crown Gall. *Agrobacterium tumefaciens*, MD, MA, OH.

BACTERIAL Fasciation. *Clavibacter fascians*, IN, MA, OH, OR.

BACTERIAL Leaf Spot. *Xanthomonas pelargonii*, MA to VA, CA, MS, OH, WA; *Pseudomonas cichorii*, FL.

BACTERIAL Wilt, Southern. *Pseudomonas solanacearum*, NC; *Ralstonia solanacearum*, Race 3, Biovar 2, CT, DE, PA.

BLIGHT, Blossom; Gray Mold; Cutting Rot. *Botrytis cinerea*, cosmopolitan.

LEAF SPOT. *Alternaria* sp., secondary; *Ascochyta* sp., CT, NJ; *Cercospora brunckii*, FL, MD, OH, NH, TX; *Pleosphaerulina* sp., PA.

MOLD, Leaf. *Botryosporium pulchrum*, occasional in greenhouses.

NEMATODE, Dagger. *Xiphinema americanum*.

NEMATODE, Leaf. *Aphelenchoides* sp., NY.

NEMATODE, Root Knot. *Meloidogyne* spp., CT, FL, NJ, OH, OR.

NONPARASITIC. *Oedema*, Dropsy. Intumescence from excessive soil moisture and retarded transpiration.

**Crook-Neck.** Chimeral mutation.

PETAL AND LEAF SPOT. *Bipolaris (Helminthosporium) setariae*, FL.

ROT, Blackleg, Stem and Cutting Rot. *Pythium debaryanum*, *P. mamillatum*, *P. splendens*, *P. ultimum*, *P. vexans*, cosmopolitan; *Rhizoctonia solani*, cosmopolitan; *Aspergillus fischeri*, CA; *Fusarium* sp., IN, NY, WA.

ROT, Root. *Thielaviopsis basicola*, CT; *Armillaria mellea*, CA; *Pythium aphanidermatum*, PA; *P. dissotocum*, PA; *P. ultimum*, PA; *P. heterothallicum*, PA; *P. irregulare*, PA; *P. myriotylum*, PA.

RUST, Pelargonium. *Puccinia pelargonii-zonalis* (II), CA, FL, NY, PA.

VIRUS. **Pelargonium Leaf Curl** (*Geranium Crinkle*), general; **Geranium Mosaic**; **Cucumber Mosaic**; **Beet Curly Top**; **Tomato Spotted Wilt**, CA, OK, TX; **Tomato Ring Spot**; **Tobacco Ring Spot**; **Pelargonium Flower Break**; **Pelargonium Line Pattern**.

WILT. *Verticillium albo-atrum*, CA, NY, OR.

The dry air of the average home makes foliage diseases due to pathogenic organisms unlikely but sometimes a water-logged soil and cloudy weather, with less evaporation, leads to oedema, small swellings in leaves, corky ridges on petioles. Botrytis blight and bacterial leaf spots may be expected in greenhouses unless plants are spaced widely, have proper air circulation, little overhead watering, and all infected plants or parts speedily removed. Start with clean cuttings from a culture-indexed mother block.

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**Geranium (Cranesbill, Herb-Robert)**

BACTERIAL Leaf Spot. *Pseudomonas erodii*, FL, IL, IN, OR, TX; *Xanthomonas geranii*, NY.

BLIGHT, Leaf Spot; Stem Rot. *Botrytis cinerea*, KS, MO.

BROOMRAPE. *Orobanche ramosa*, TX.

DOWNY MILDEW. *Plasmopara geranii*, NJ to FL, KS, TX, MA to IA, MT, UT, WI.

GALL, Leaf. *Synchytrium geranii*, LA, OK, TX.

LEAF SPOT. *Cercospora geranii*, CO, IA, KS, MO, MT, NY, TX, UT, WI;

*Cylindrosporium geranii*, LA;

*Dilophospora geranii*, WI; *Pestalozziella*

*subsessilis*, MS, MO, NJ, WI; *Phyllosticta*

*geranii*, LA, TX; *Ramularia geranii*, CA,

LA, WA, WY; *Septoria expansa*, KS, TX;

*Stigmatea geranii*, black leaf speck, MD;

*Venturia circinans*, mold, AK.

POWDERY MILDEW. *Erysiphe polygoni*, CO, IL, IN, OH, PA, WV, WI, WY; *Sphaerotheca macularis*, CA, ID, MN, MT, NE, PA, WA, WI, WY.

ROT, Rhizome. *Seaverinia geranii*, NY, OH, WI.

ROT, Root. *Phymatotrichum omnivorum*, TX.

RUST. *Puccinia leveillei* (III), CO, MT, UT, WA, WY; *P. polygoni-amphibii* (0, I), CT to WI, KS, MN, MO, MT, TX; II, III on Polygonum;

*Uromyces geranii* (0, I, II, III), AK, ME, WY.

VIRUS. Cucumber Mosaic, FL.

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**Gerbera (Transvaal Daisy)**

BLIGHT, Flower; Ray Speck. *Alternaria dauci* f. *sp. solani*, FL.

BLIGHT, Gray Mold. *Botrytis cinerea*, FL, NY.

LEAF SPOT; Stem Rot. *Gloeosporium* sp., NY.

NEMATODE, Root Knot. *Meloidogyne* sp., AL, CA, MD, NY, NC.

POWDERY MILDEW. *Golovinomyces cichoracearum*, CA, OK.

ROT, Crown. *Sclerotinia sclerotiorum*, MD, NY.

ROT, Root and Stem. *Phytophthora cryptogea* and *P. drechsleri*, CA, NJ, NY; *Pythium irregulare*, CA.

VIRUS. Tobacco Rattle, FL; Tomato Spotted Wilt-Impatiens Serotype, FL.

WILT, Fusarium. *Fusarium chrysanthemi*, *F. oxysporum* f. *sp. trachapheillum*, FL.

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**Germander (*Teucrium*)**

DOWNY MILDEW. *Peronospora* sp., OK.

LEAF SPOT. *Cercospora teucrii*, NY to MS, TX, WI; *Phyllosticta decid-ua*, TX, WI.

NEMATODE, Root Knot. *Meloidogyne hapla*.

POWDERY MILDEW. *Golovinomyces cichoracearum*, IL, PA, WI.

RUST. *Puccinia menthae* (0, I, II, III), PA.

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**Geum (*Avens*)**

BACTERIAL, MLO. California Aster Yellows, CA.

DOWNY MILDEW. *Peronospora potentillae*, CA, IL, IN, IA, KS, NE, WI.

GALL, Leaf. *Synchytrium aureum*, WI.

LEAF SPOT. *Cercospora gei*, WI; *Cylindrosporium gei*, NH, WI; *Marssonina adunca*, MT, WA; *Phyllosticta* sp., WV, WI; *Ramularia gei*, MO, WI; *Septoria gei*, AK, DE, IL, MI, NE, NY, OH.

NEMATODE, Root Knot. *Meloidogyne* sp., CA.

POWDERY MILDEW. *Erysiphe polygoni*, AK; *Sphaerotheca macularis*, IN, MD, NE, NY, ND, OH, PA, WA, WI.

ROT, Root. *Phymatotrichum omnivorum*, TX.

RUST. *Puccinia sieversii*, CO.

SMUT, Leaf. *Urocystis (Whetzelia) waldsteiniae*, MT, WA.

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**Gilia (Skyrocket)**

LEAF SPOT. *Ramularia giliae*, OR.

NEMATODE, Lesion. *Pratylenchus pratensis*, TX.

NEMATODE, Root Knot. *Meloidogyne* sp., CA.



NEMATODE, Stem. *Ditylenchus dipsaci*.

POWDERY MILDEW. *Sphaerotheca macularis*, CA, TX, WA.

ROT, Root. *Phymatotrichum omnivorum*, TX.

RUST. *Puccinia aristidae* (0, I), AZ, CO; *P. giliae* (II, III), AZ, CA, CO, NE, OR, WA; 0, I, unknown; *P. plumbaria* (0, I, III), CA, CO, NE, UT, WY; *P. yosemitana* (0, III), CA, CO; *Gymnosporangium exterum* (0, I), IN, KY, MO, NC, TN, VA, III on red-cedar.

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### Gillenia (American Ipecac, Indian Physic)

RUST. *Gymnosporangium exterum* (0, I), IN, KY, MO, NC, TN, VA, III on red-cedar.

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### Ginger, Edible (*Zingiber*)

BACTERIAL, Rhizome Rot. *Enterobacter cloacae*, HI.

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### Ginger, Wild (*Asarum*)

GALL, Leaf. *Synchytrium asari*, CA, MN, WI.

LEAF SPOT. *Ascochyta versicolor*, ID; *Plagiostoma (Laestadia) asarifolia*, SC.

ROT, Rhizome. *Sclerotinia sclerotiorum*, NY.

RUST. *Puccinia asarina*, CA, ID, OR, WA.

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### Ginkgo (Maidenhair-Tree)

ANTHRACNOSE. *Glomerella cingulata*, MD, TX.

BACTERIAL LEAF SPOT, Canker Stem. *Pseudomonas syringae* pv. *syringae*, CA.

LEAF SPOT. *Phyllosticta ginkgo*, PA; *Epicoccum purpurascens*, IL.

NEMATODE, Root Knot. *Meloidogyne* sp., MS.

ROT, Root. *Phymatotrichum omnivorum*, TX.

ROT, Sapwood. *Polyporus hirsutus*; *P. lacteus*; *P. tulipiferae*; *P. versicolor*; *Fomes connatus*, MD.

ROT, Seed. *Xylaria longeana*, PA.

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### Ginseng (*Panax*)

BLIGHT. *Alternaria panax*, general; *Botrytis cinerea*, NY to NC, MI, WA.

DAMPING-OFF. *Pythium debaryanum*, NY; *Rhizoctonia solani*, AR, IN, MI, NJ, NY, WA; *Phytophthora citricola*, MI.

LEAF SPOT. *Septoria* sp.; *S. araliae*, WI; *Colletotrichum dematium*, secondary, NY to NC, MN, MO.

NEMATODE, Root Knot. *Meloidogyne* sp., CT, MI, NY, OH, PA, WI.

NONPARASITIC. **Papery Leaf.** Moisture deficiency, sunscald, MI, MO, NJ, NY, PA.

POWDERY MILDEW. *Erysiphe panax*.

ROT, Rhizome. *Sclerotinia sclerotiorum*, white rot, MI, NY, OH, PA, WA, WI; *S. smilacina*, black rot, MI, MN, NY, WI.

ROT, Root. *Armillaria mellea*, WA; *Fusarium scirpi*, NY to AL, MO, WA, WI; *Phytophthora colocasiae*, NC; *Thielaviopsis basicola*, black root, IL, MI, NJ, NY, OH; *Ramularia* spp., MI, NY, OR, WA, WI.

ROT, Stem, Root; Downy Mildew. *Phytophthora cactorum*, CT to NC, IA, MI, WA.

RUST. *Puccinia araliae* (III), MA, PA.

WILT. *Verticillium albo-atrum*, IN, KY, MI, NJ, NY, OH, PA, TN, WI.

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### Gladiolus

BACTERIAL Leaf Blight. *Xanthomonas gummisudans*, NY to MO, ND, WA.

BACTERIAL, MLO. **Aster Yellows**, MD.

BACTERIAL Scab; Neck Rot; Leaf Spot. *Pseudomonas marginata*, general.

BACTERIAL Soft Rot. *Erwinia carotovora*, MI.

BLIGHT, Brown Spot of leaves, flowers. *Curvularia lunata (Cochliobolus lunata)*, FL, MD, MI, NY, NC, VA, WI.

BLIGHT, Leaf; Flower Spot; Corm Rot. *Botrytis gladiolorum*, AK, CA, FL, MA, MD, NJ, NY, OR, WA, WI.

BLIGHT, Seedling. *Botrytis elliptica*, WA.

BLIGHT, Southern. *Sclerotium rolfsii*, FL.

LEAF SPOT. *Alternaria* spp., cosmopolitan;  
**Cladosporium herbarum**, cosmopolitan but  
secondary; **Heterosporium** sp., MD;  
**Stemphylium** sp., leaf and stem spot, FL,  
MI, NJ, NY.

NEMATODE, Root Knot. **Meloidogyne** spp., NC to  
FL, TX; **M. hapla**.

NEMATODE, Sheath. **Hemicycliophora oracilis**,  
OR.

NONPARASITIC **Leaf Scorch**. Atmospheric fluo-  
rides, WA.

**Brown Tip**. From waterlogged soil.

**Ink Spot**. On husks and corms. Cause unknown.  
“**Rust**.” Spot necrosis on leaves, from sun on  
water drops.

**Topple**. Partially controlled by spraying flowers  
with calcium nitrate.

ROT, Corm, Basal; Yellows; Wilt. **Fusarium**  
**oxysporum** f. sp. **gladioli**, general.

ROT, Dry, of corms; Leaf and Stalk Rot.  
**Stromatinia gladioli**, general.

ROT, Hard; Leaf Spot. **Septoria gladioli**, general.

ROT, Root, Collar, Leaf Base. **Rhizoctonia**  
**solani**, NJ, ND, TX.

ROT, Storage. **Penicillium gladioli**, general in the  
North, occasional in the South;  
**P. funiculosum**, core rot; **Rhizopus arrhizus**,  
soft, occasional.

RUST, **Uromyces transversalis**, Mexico  
(Michoacan), CA, FL.

SMUT. **Urocystis gladiolicola**, CA.

VIRUS. **Cucumber Mosaic**; **Yellow Bean Mosaic**  
(mild mosaic); **White Break**, NY to IL, CA,  
WA; **Tomato Ring Spot**.

The backyard gardener with a few rows of glad-  
iolus probably sprays for thrips and forgets about  
diseases, but the serious grower has much to com-  
bat. Control starts with choosing varieties resistant  
to *Fusarium* yellows, treating corms after digging  
and before planting to control rots and scab, with  
removal of husks usually giving a healthier crop,  
and field spraying for *Botrytis*, *Curvularia*, and  
*Stemphylium* flower blights and leaf spots. Mild  
mosaic is spread from beans to gladiolus by aphids;  
so they should be kept widely separated. Rogue  
plants with white-break mosaic. An aluminum  
mulch repels aphid vectors of virus diseases.

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## Globe-Amaranth (*Gomphrena*)

LEAF SPOT. **Cercospora gomphrenae**, GA,  
OK, TX.

NEMATODE, Root Knot. **Meloidogyne** sp., FL.

VIRUS. **Beet Curly Top**, TX; **Tomato Spotted**  
**Wilt-Impatiens Serotype**, FL, GA.

WHITE RUST. **Albugo bliti**, NM.

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## Globe-Mallow (*Sphaeralcea*)

POWDERY MILDEW. **Erysiphe polygoni**, ID.

RUST. **Puccinia interveniens**, ID, WA;  
**P. schedonnardi**, AZ, NM; **P. sherardiana**,  
AZ, CA, CO, ID, NE, NM, TX, UT, WY;  
**P. sphaeralcea** (I, III), CA.

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## Globe-Thistle (*Echinops*)

ROT, Crown. **Sclerotium rolfsii**, CT.

ROT, Root. **Phytophthora cryptogea**, NC.

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## Glory-Bush (*Tibouchina*)

ROT, Mushroom Root. **Clitocybe tabescens**,  
FL.

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## Gloxinia (*Sinningia*)

BACTERIAL Leaf Blight. **Pseudomonas** sp., OR.

BACTERIAL Leaf Spot. **Pseudomonas alcaligenes**,  
FL.

BACTERIAL, MLO. **Aster Yellows**, CA.

BLIGHT, Bud Rot. **Botrytis cinerea**, CA, MO.

NONPARASITIC. **Dieback Wilt**; Boron deficiency,  
CA.

ROT, Crown; Flower, Leaf Blight. **Sclerotinia**  
**sclerotiorum**, CA.

ROT, Leaf. **Cladosporium herbarum**, NJ.

ROT, Root and Crown. **Phytophthora cryptogea**,  
CA; **P. tropicalis**, NC; **Pythium ultimum**,  
CA; **Myrothecium roridum**, FL.

VIRUS. **Tomato Spotted Wilt**, CA, MO, NC, TX;  
**Tobacco Mosaic**, CA, CT, DC, FL, OH, WA;  
**Impatiens Necrotic Spot**, NC.

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### Gnaphalium (Cudweed)

BACTERIAL, MLO. **California Aster Yellows**;  
 CANKER, Stem. **Phoma erysiphoides**, TX, WI.  
 DOWNY MILDEW. **Plasmopara halstedii**,  
 AL, MS.  
 LEAF SPOT. **Cercospora gnaphaliacea**, KS, MS;  
**Cylindrosporium gnaphalicola**, AL, TX;  
**Septoria cercosperma**, TX.  
 NEMATODE, Root Knot. **Meloidogyne** sp.  
 ROT, Root. **Phymatotrichum omnivorum**, TX.  
 RUST. **Puccinia gnaphaliicola** (II, III), AL, LA,  
 NC, SC; 0, I unknown; **P. investita** (0, I, III),  
 AZ, CA, CT, MA, NY, OH, PA, TN, VT, WV,  
 WI.  
 SMUT, White. **Entyloma compositarum**,  
 AL, MD.  
 VIRUS. **Beet Curly Top**, CA; **Tomato Spotted  
 Wilt**, GA.

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### Goats-Beard (*Aruncus*)

LEAF SPOT. **Cercospora** sp., OR; **Ramularia  
 ulmariae**, AK.

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### Godetia

BACTERIAL, MLO. **California Aster Yellows**,  
 CA.  
 BLIGHT, Gray Mold. **Botrytis cinerea**, AK.  
 DAMPING-OFF. **Rhizoctonia solani**, IL.  
 DOWNY MILDEW. **Peronospora arthuri**, CA.  
 NEMATODE, Root Knot. **Meloidogyne** sp.  
 ROT, Root. **Pythium ultimum**, MO;  
**Phytophthora cryptogea**.  
 RUST. **Puccinia oenotherae** (0, I, II, III);  
**P. pulverulenta** (0, I, II, III), CA;  
**Pucciniastrum epilobii** (II, III), AK; 0, I on  
 fir.  
 VIRUS. **Tomato Spotted Wilt**, CA.

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### Golden-Chain (*Laburnum*)

BLIGHT, Twig. **Gibberella baccata**, NJ; **Fusarium**  
 sp., MD, OH.  
 CANKER, Stem. **Diplodia mutila**, OH.  
 LEAF SPOT. **Cercospora laburni**, OK.

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### Golden-Club (*Orontium*)

BLIGHT, Leaf. **Botrytis streptothrix**, NJ.  
 LEAF SPOT. **Mycosphaerella** sp., NJ; **Phyllosticta  
 orontii**, NJ, TX; **Ramularia orontii**, NJ;  
**Volutella diaphana**, NJ.

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### Golden-Eye (*Viguiera*)

POWDERY MILDEW. **Golovinomyces  
 cichoracearum**, UT.  
 ROT, Root. **Phymatotrichum omnivorum**, TX;  
**Helicobasidium purpureum**, TX.  
 RUST. **Puccinia abrupta** (II, III) AZ, TX;  
**P. tumidipes** (II, III), AZ, CA.  
 SMUT, White. **Entyloma compositarum**, UT.

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### Golden-Glow (*Rudbeckia lacinata*)

BACTERIAL, MLO. **Aster Yellows**; **California  
 Aster Yellows**.  
 BLIGHT, Southern. **Sclerotium rolfsii**, FL.  
 DOWNY MILDEW. **Plasmopara halstedii**, IA, NE,  
 NC, ND, WI.  
 GALL, Leaf. **Synchytrium aureum**, IL, WI.  
 LEAF SPOT. **Cercospora rudbeckiae**, NY;  
**Phyllosticta rudbeckiae**, IA, NY, WI;  
**Ramularia rudbeckiae**, VT to MS, CO and  
 ID; **Septoria rudbeckiae**, KS, NE, WI.  
 POWDERY MILDEW. **Golovinomyces  
 cichoracearum**, general.  
 ROT, Stem. **Sclerotinia sclerotiorum**, CT.  
 RUST. **Puccinia dioicae** (0, I), MO, SD;  
**Uromyces perigynius** (0, I), MD to MO,  
 MT; II, III on *Carex*; **U. rudbeckiae** (III),  
 MD to MS, NM, MT.

SMUT, White. **Entyloma compositarum**, IA, MO, OH, WI.

VIRUS. **Potato Yellow Dwarf; Mosaic**, unidentified. Powdery mildew is commonly present.

### Golden-Larch (*Pseudolarix*)

CANKER. **Dasyscyphus willkommii**, MA.

### Goldenrain-Tree (*Koelreuteria*)

CANKER. **Nectria cinnabarina**, CA, CT.

LEAF SPOT. **Cercospora** sp., FL.

ROT, ROOT. **Phymatotrichum omnivorum**, TX.

WILT. **Verticillium** sp., NJ.

### Goldenrod (*Solidago*)

BLACK KNOT. **Gibberidea heliopsisidis**, CT, MO, NY, ND.

BLIGHT, Thread. **Pellicularia koleroga**, LA.

CANKER, Stem. **Botryosphaeria ribis**, IA.

DODDER. **Cuscuta** spp., occasional.

DOWNY MILDEW. **Basidiophora entospora**, IL, WI; **Plasmopara halstedii**, IL, WI.

GALL, Leaf. **Rhodochytrium spilanthis**, LA.

LEAF SPOT. **Ascochyta compositarum**, WI;

**Asteroma solidaginis**, black scurf;

**Cercospora parvimaculans**, WI;

**Colletotrichum solitarium**, KS, NE, WI;

**Macrophoma sphaeropsispora**;

**Phyllosticta solidagni-cola**, IL, WI;

**Placosphaeria haydeni**, black spot;

**Ramularia serotina**, CO, IL, TX, WI, WY;

**Septoria** spp.

MOLD, Leaf. **Cladosporium astericola**, WI.

NEMATODE, Lesion. **Pratylenchus pratensis**, FL.

POWDERY MILDEW. **Golovinomyces cichoracearum**, general; **Phyllactinia corylea**, WA; **Sphaerotheca macularis**, IN; **Uncinula** sp., NY.

ROT, Root. **Phymatotrichum omnivorum**, TX.

RUST. **Coleosporium delicatulum** (II, III), ME to VA, KS; 0, I on pine; **C. asterum** (II, III),

general; 0, I on 2- and 3-needle pines; **Puccinia dioicae** (0, I), general; II, III on *Carex*; **Puccinia virgae-aureae** (III), IL, NH, MA, MI, NY; **P. grindeliae** (III), IL, WI to CA, WA; **P. stipae** (0, I), CO, MT, NE, NM, ND; II, III on *Stipa*; **Uromyces perigynius** (0, I), ME; II, III on *Carex*; **U. solidaginis** (III), CO, ID.

SMUT, Inflorescence. **Thecaphora cuneata**, KS.

SPOT ANTHRACNOSE. **Elsinoë solidaginis**, FL, GA, SC.

VIRUS. **Mosaic**. Unidentified, NY; **Tomato Spotted Wilt**, PA.

### Goldenseal (*Hydrastis*)

BLIGHT, Leaf. **Alternaria** sp., MI, NY, OH; **Botrytis** sp., CT to NC, IN, WA, WI.

NEMATODE, Root Knot. **Meloidogyne** spp., OH, MI, WA.

ROT, Root. **Phymatotrichum omnivorum**, TX; **Rhizoctonia solani**, NC.

ROT, Stem. **Phytophthora cactorum**, NC.

VIRUS. **Mosaic**. Unidentified, CT.

WILT. **Fusarium** sp., IL, NY, OH, WA.

### Goldentop (*Lamarckia*)

RUST. **Puccinia coronata** (II, III), CA; **P. graminis**, CA.

VIRUS. **Mosaic**, IA.

### Goldthread (*Coptis*)

LEAF SPOT. **Mycosphaerella coptis**, ME, NY, VT; **Septoria coptidis**, ID, MI, NY, VT, WI, WA; **Phyllosticta helleboricola** var. **coptidis**, AK; **Vermicularia coptina**, NY.

### Gopher Plant or Caper Spurge (*Euphorbia*)

ROT, Root. **Macrophomina phaseolina**, AZ; **Pythium aphanidermatum**, AZ; **Rhizoctonia solani**, AZ.

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**Gooseberry (*Ribes*)**

- ANTHRACNOSE. *Pseudopeziza ribis*, general.
- BLIGHT, Cane. *Botryosphaeria ribis*, NJ, VA;  
*Leptosphaeria coniothyrium*, IN, MO.
- BLIGHT, Thread. *Pellicularia koleroga*, FL.
- CANKER; DIEBACK. *Nectria cinnabarina*, coral spot; *Botrytis cinerea*, CT, OR, WA;  
*Phragmodothella ribesia*, twig knot;  
*Physalospora obtusa*, NY to VA, KS.
- DODDER, *Cuscuta* sp., MN, NY.
- DOWNY MILDEW. *Plasmopara ribicola*, MT, OR, WV, WI.
- LEAF SPOT. *Marssonina grossulariae*, OH, WI;  
*Cercospora angulata*, NY to MI, MO;  
*Mycosphaerella ribis*, MA to VA, AL, KS, MN, OR; *Phyllosticta grossulariae*, CT, NJ, WA, WI; *Ramularia* sp., MI.
- NEMATODE, Leaf, Bud. *Aphelenchoides ritzemabosi*, CA.
- NONPARASITIC. Leaf Blotch. Magnesium deficiency, OR.
- Leaf Scorch. Potassium deficiency.
- POWDERY MILDEW. *Sphaerotheca macularis*, MN; *S. mors-uvae*, general; *Microsphaera grossulariae*, CA; *Phyllactinia corylea*, NY.
- ROT, Root. *Armillaria mellea*, OR, WA;  
*Dematophora* sp.; *Xylaria hypoxylon*, OR;  
*Phymatotrichum omnivorum*, TX.
- RUST. *Puccinia caricina* var. *grossulariata* (0, I) leaves, fruit, ME to MD, AK, ID, KS, MS, II, III on *Carex*; *P. caricina* var. *uniporula*, IA, MD, NY, WI; *Coleosporium jonesii* (II, III), CO, MO, MN, NM, WI, WY; *Cronartium occidentale*, AZ, CO, UT; *C. ribicola*, white pine blister rust (II, III) – European varieties are resistant.
- SPOT ANTHRACNOSE, Scab. *Sphaceloma ribis*, WA.
- VIRUS. Mosaic. Unidentified, IL, NY.

Powdery mildew caused by *Sphaerotheca mors-uvae* is probably the most important gooseberry disease but is readily controlled by a lime-sulfur spray immediately after bloom, followed by bordeaux mixture spray for leaf spots.

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**Gordonia (Franklinia and Loblolly-Bay)**

- BLACK MILDEW, *Meliola cryptocarpa*, FL, LA.
- LEAF SPOT. *Phyllosticta gordoniae*, FL.
- ROT, Root. *Phymatotrichum omnivorum*, TX.

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**Gouania**

- RUST. *Puccinia invaginata* (II, III), FL.

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**Gourd (*Lagenaria*, *Luffa*, *Trichosanthes*)**

- ANTHRACNOSE. *Colletotrichum lagenarium*, CT, IL, IN, IA, MD, MN, NE, PA.
- BACTERIAL, Angular Leaf Spot. *Pseudomonas lachrymans*, WI.
- BLIGHT, Southern. *Sclerotium rolfsii*, SC.
- BLIGHT, Thread. *Pellicularia koleroga*, FL.
- DOWNY MILDEW. *Pseudoperonospora cubensis*, CT, FL, MA, NC, OH.
- FRUIT SPOT. *Macrophoma trichosanthis*, AL; *Phoma subvelata*, TX; *Stemphylium* sp., NY.
- LEAF SPOT. *Cercospora cucurbitae*, AL, IN.
- NEMATODE, Root Knot. *Meloidogyne* sp., AL, FL, OH.
- POWDERY MILDEW. *Golovinomyces cichoracearum*, CT, WI.
- ROT, Fruit. *Mycosphaerella citrullina* (*Laestadia cucurbitacearum*), PA.
- ROT, Root. *Phymatotrichum omnivorum*, TX.
- VIRUS. Cucumber Mosaic, IN, NY; Tobacco Ring Spot, TX, on *Luffa acutangula*; Zucchini Yellow Mosaic, Papaya Ringspot - Type W, Brazil.

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**Grape (*Vitis*)**

- ANTHRACNOSE. *Elsinoë ampelina*, MI.
- BACTERIAL Crown Gall. *Agrobacterium tumefaciens*, widespread.
- BACTERIAL Leaf Spot. *Xanthomonas* sp., NY.

- BACTERIAL, Melting, Decay. **Bacillus subtilis**, CA; **Cryptococcus laurentii**, CA.
- BACTERIAL, Xylem-limited. **Pierce's Disease**, NC.
- BLACK FOOT. **Cylindrocarpon liriodendra**, CA.
- BLACK GOO. **Phaeoacremonium chlamydosporum**, CA.
- BLACK LEG. **Cylindrocarpon obtusisporum**, CA.
- BLIGHT, Shoot. **Sclerotinia sclerotiorum**, CA.
- BLOTCH, Leaf. **Briosia amphelophaga**, TX.
- CANKER. **Lasiodiplodia crassispora**, CA; **Diplodia corticola**, CA.
- CANKER, Bot. **Lasiodiplodia theobromae**, **Diplodia seriata**, CA, Mexico.
- CANKER; Deadarm; Branch Necrosis. **Cryptosporella (Phomopsis) viticola**, wide-spread; **Aspergillus niger**, CA.
- CANKER; Dieback. **Botryosphaeria rhodina** and **B. obtusa**, Baja, Mexico.
- CANKER, Wedge-shaped. **Botryosphaeria** sp., CA.
- DECLINE. **Phaeoacremonium aleophilum**; **P. chlamydosporum**, NY, PA; **P. inflatipes**, CA; **Botryosphaeria liberica**, **B. viticola**, CA.
- DIEBACK. **Eutypa armeniacae**, CA, NY; **E. lata**, CA, MI; **Eutypella vitis**, MI.
- DIPLODIA CANE DIEBACK. **Lasiodiplodia theobromae**, Bolivia.
- DOWNY MILDEW. **Plasmopara viticola**, general, serious in East.
- FRUIT SPOT; Flyspeck. **Leptothyrium pomi**, PA, WV.
- LEAF SPOT. **Mycosphaerella personata (Isariopsis clavispora)** wide-spread **Phomopsis viticola**, NY; **Septoria ampelina**, NY, TX, VA; **Septosporium heterosporum**, CA.
- LEAF SPOT, Zonate. **Cristulariella pyramidalis**, WV; **C. moricola**, GA.
- MEASLES. **Togninia fraxinopennsylvanica** Anamorph, **Phaeoacremonium viticola**, CA.
- NEMATODE. **Meloidoderita** sp., NY.
- NEMATODE, Citrus. **Tylenchulus semipenetrans**, CA.
- NEMATODE, Cyst. **Heterodera punctata**, MI.
- NEMATODE, Dagger. **Xiphinema index**, NEMATODE, Lesion. **Pratylenchus pratensis**, CA; **P. minyus**, CA; **P. coffeae**, CA; **P. vulnus**, CA.
- NEMATODE, Pin. **Paratylenchus hamatus**.
- NEMATODE, Ring. **Criconemoides xenoplax**, CA.
- NEMATODE, Root Knot. **Meloidogyne** spp.
- NEMATODE, Spiral. **Helicotylenchus pseudorobustus**, CA.
- NEMATODE, Stubby Root. **Paratrichodorus christiei**.
- NONPARASITIC. **Little Leaf**. Zinc deficiency, CA. **Shot Berry**. Defective pollination.
- Skin Blanching**. Sulfur dioxide injury.
- PHYTOPLASMA, Aster Yellows. **Candidatus Phytoplasma asteris**, British Columbia, Ontario, Quebec, Canada.
- PHYTOPLASMA, Bois Noir. British Columbia, Canada.
- PIERCE'S DISEASE. **Xyella fastidiosa**, OK.
- POWDERY MILDEW. **Uncinula necator**, general, MA.
- ROT, Bitter. **Greeneria uvicola**, MS; **Melanconium fuliginum**, wide-spread, often secondary after black rot.
- ROT, Black. **Guignardia bidwellii**, general.
- ROT, Charcoal. **Macrophomina phaseoli**, TX.
- ROT, Fruit. **Alternaria** sp., CA; **Aspergillus niger**, black mold, CA, OR; **Botrytis cinerea**, gray mold, CA; **Cladosporium** sp., green mold; **Penicillium** spp., blue mold, cosmopolitan; **Glomerella cingulata**; **Colletotrichum acutatum**; **C. gloeosporioides**, ripe rot; **Pestalotia** sp., **Phoma** spp.; **Botryosphaeria dothidea**, **Macrophoma** rot, MS; **Monilinia fructicola**, brown rot, British Columbia, Canada.
- ROT, Root. **Armillaria mellea**, AR, CA, MO, TX, WA; **Phymatotrichum omnivorum**, TX; **Clitocybe tabescens**, SC to TX, OK; **Roesleria hypogaea**, NY to VA, IA, MO; **R. subterranean**, MI, Midwest U.S.; **Rosellinia necatrix**, AL, IN, MI, NY, OH.
- ROT, Sour. **Hanseniaspora uvarum**, Ontario Canada; **Gluconobacter cerinus**, Ontario, Canada; **Aspergillus carbonarius**, CA.
- ROT, Summer Bunch. **Diplodia viticola (D. natalensis)**.
- ROT, White; Dieback. **Coniothyrium diplodiella**, MA to FL, TX.

ROT, Wood. **Schizophyllum commune**, VA; **Stereum** spp.; **Poria** spp.; **Polyporus** spp.; **Pleurotus ostreatus**, CA.

RUST. **Physopella ampelopsidis** (*P. vitis*) (II), FL, SC.

SCORCH, Leaf. **Pseudopezicula tetraspora**, NY, PA.

SPOT ANTHRACNOSE; Bird's Eye Rot. **Elsinoë ampelina**, widespread.

TRUNK DISEASE. **Neofusicoccum parvum**, **Cryptovalsa ampelina** and **Eutypella leprosa**, Chile.

VASCULAR; FOLIAR DISEASE. **Phaeoacremonium**, CA.

VIRUS. **Alfalfa Dwarf**; **Grape Fanleaf**, WA, Pacific Northwest; **Grape Leafroll** (White Emper or Disease), CA, ID, WA, Chile; **Grape Yellow Mosaic**; **Virus Complex** (Kober Stem Grooving), CA; **Tobacco Ring Spot**, MI, NY; **Tomato Ring Spot**, NY; **Grapevine Fleck**, WA; **Grapevine Stem Pitting** Associated, CA; **Peach Rosette Mosaic**; **Tomato Spotted Wilt**; **Grapevine Rupestris Vein Feathering**, CA; **Grapevine Syrah**, CA, WA, Chile.

Black rot is the most destructive grape disease in most sections of the country, often causing total loss of fruit in home gardens. Pierce's disease has destroyed many vineyards in California, the pathogen is transmitted by grafting and by leafhoppers.

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## Grapefruit

► Citrus Diseases.

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## Grape-Hyacinth (*Muscari*)

ROT, Dry. **Sclerotium** sp., MO, WA.

SMUT, Flower. **Ustilago vaillantii**, MA, WA.

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## Grasses, Lawn, Turf

Includes *Agropyron repens*, quackgrass; *Agrostis alba*, redtop; *A. canina*, *A. palustris*, *A. stolonifera*, *A. tenuis*, bentgrasses; *Cynodon dactylon*, Bermuda grass; *Festuca* spp., fescues;

*Poa compressa*, *P. pratensis*, *P. annua*, and *P. trivialis*. Canada, Kentucky, annual bluegrasses and Roughstalk; *Stenotaphrum*, St. Augustine grass; *Dactylis glomerata*, orchardgrass; *Lolium multiflorum*, Italian ryegrass; *L. perenne*, Perennial ryegrass; *Ammophila breviligulata*, American beachgrass; *Imperata cylindrica*, Cogangrass; *Miscanthus sinensis*, Perennial grass; *Spartina alterniflora*, smooth cordgrass.

ANTHRACNOSE. **Colletotrichum graminicolum**, general.

BACTERIAL Blight. **Pseudomonas syringae** pv. **coronafaciens**, AK; **P. syringae** pv. **alisalensis** On brome, oat, and common timothy grasses, CA; **Xanthomonas translucens** pv. **poae**, MT; **X. translucens** pv. **cerealis**, ID.

BACTERIAL Gummosis. **Rathayibacter rathayi**, MD, OR, Northeast and Mid-Atlantic U.S.

BACTERIAL Stunting. **Clavibacter xyli** subsp. **cynodontis**, FL.

BACTERIAL Wilt, Decline, and Necrosis. **Acidovorax** spp., NC.

BACTERIAL, Xylem-limited. **Rickettsialike organism**, MI.

BLACK SPOTS, FOLIAR. **Exserohilum longirostratum**, MS, TX.

BLIGHT. **Fusarium roseum** f. sp. **cerealis**, MD, NJ, NY, OH, PA; **F. tricinctum** f. sp. **poae**; **Leptosphaeria korrae**, CA, MD, NJ, NY, and **Phialophora graminicola**, CA, NJ, NY. (New identification for *Fusarium* Blight); **Limonomyces roseipellis**, NC; **Labyrinthula** sp., AZ.

BLIGHT, Cottony. **Pythium aphanidermatum**, general.

BLIGHT, Dieback (on Johnsongrass, **Sorghum halepense**); Yellow Foxtail, **Setaria glauca**; Broadleaf Signalgrass, **Brachiaria platyphylla**. **Bipolaris cyanodontis**, Southeast U.S.; **Curvularia lunata**, Southeast U.S.; **C. geniculata**, Southeast U.S.; **Exserohilum rostratum**, Southeast U.S.

BLIGHT, Foliar. **Pythium sylvaticum**, IL; **Colletotrichum cereale**, AL, MS.

BLIGHT, Leaf. **Pyricularia grisea**, on bent and St. Augustine; **Pellicularia filamentosa** f. sp. **sasakii**; **Drechslera catenaria**, OH;

- Rhizoctonia solani**, FL; **Penicillium oxalicum**, NC; **Pithomyces chartarum**, KY.
- BLIGHT, Melting Out. **Curvularia geniculata**; **C. inaequalis**; **C. lunata**; **Sclerotinia homoeocarpa**, MS.
- BLIGHT, Rapid. **Labyrinthula terrestris**, CO.
- BLIGHT, Southern. **Sclerotium rolfsii**, FL, IL, NJ.
- BLIGHT (Zonate Leaf Spot). **Drechslera gigantea** (*Helminthosporium gigantea*), RI; **Bipolaris sorokiniana**, Southeast, U.S.
- BLOTCH, Purple leaf. **Septoria macropoda**; **S. agropyrina**, brown; **S. elymi**, northern U.S.
- CHOKER. **Epichloe typhina**, OR.
- DAMPING-OFF. **Cladochytrium graminis**, on bentgrass.
- DEAD SPOT. **Ophiosphaerella agrostis**, MD, Ontario, Canada; (Spring Dead Spot) **O. herpotricha**, MS.
- DIEBACK, Wetland. **Fusarium aestuarinus**, CT.
- DODDER. **Cuscuta** sp., MO.
- DOLLAR SPOT. **Sclerotinia homoeocarpa**, IL, NY, PA, WA.
- DOWNY MILDEW. **Sclerophthora macrospora**, IL, LA, MS, TX, on St. Augustine grass and Kentucky bluegrass; **Sclerospora farlowii**, OK, on Bermuda grass.
- ERGOT. **Claviceps purpurea**, NY to KY, MT, ND, TX, OK, OR, WI; **C. microcephala**, MD, MI, OH; **C. cynodontis**, OK.
- FAIRY RING. **Marasmius oreades**; **Psalliota campestris**; **Lepiota morgani**; **Cyathus stercoreus** (birds nest fungus), MN.
- HONEYDEW. **Claviceps purpurea**, OK.
- LEAF SPOT. **Ascochyta agropyrina**, Northwest; **A. desmazieri**, CA, OR, WA; **A. elymi**; **A. gramineae** on Bermuda grass; **A. hordei**; **A. sorghi**; **A. graminicola**; **A. utahensis**; **Cercospora seminalis**, TX; **C. fuscomaculans**; **C. poagena**; **Cylindrosporium glyceriae**, NY; **Leptosphaeria korrae**, ringspot, MD, PA, WI; **Macrophoma** sp., OR; **Ovularia pulchella**, OR, UT; **Phaeoseptoria** sp., OR; **Placosphaeria graminis**; **Septogloeum oxysporum**, char spot, widespread; **Stagonospora intermixta**; **Pithomyces chartarum**, NE; **Bipolaris hawaiiensis**, MS.
- LEAF SPOT, Black, Tar. **Phyllachora graminis**, widespread; **P. sylvatica**, Northwest.
- LEAF SPOT, Brown Stripe. **Scolecotrichum graminis**, widespread, except on ryegrass.
- LEAF SPOT, Copper. **Ramulispora** (*Gloeocercospora*) **sorghi**, CA, LA, PA, RI, on bentgrass.
- LEAF SPOT, Frog-eye. **Selenophoma donacis**, northern states; **S. everhartii**; **S. obtusa**.
- LEAF SPOT, Gray. **Pyricularia grisea**, blast disease, CA, CT, IL, IN, ME, MA, NH, PA, RI; **P. Perenne** (on ryegrass), NV.
- LEAF SPOT, Gray Leaf Speckle. **Septoria triseti**, OR, WA on redtop, bent; **S. calamagrostidis**, AK, OR, WY; **S. loligena**, CA; **S. nodorum**; **S. oudemansii**, northern U.S.; **S. secalis**, white leaf spot; **S. tenella**, northern plains; **S. tritici** var. **lolicola**.
- LEAF SPOT, Melting-out. **Helminthosporium vagans**, on bluegrass; **H. sativum**; **H. giganteum**, Zonate eye-spot, general; **H. dictyoides**, fescue netblotch; **H. siccans**, brown blight; **H. stenacrum**, leaf mold; **H. triseptatum**, gray leaf mold; **H. cynodontis**, Bermuda grass leaf blotch; **H. erythrospilum**; **H. rostratum**; **H. stenophilum**.
- LEAF SPOT, Red Eye-Spot. **Mastigosporium rubricosum**, ME, OR, WA, WY.
- LEAF SPOT, Yellow Ring. **Trechispora alnicola**, IL.
- MOLD. **Cladosporium herbarum**; **Fusarium heterosporum**.
- NEMATODE. **Longidorus breviannulatus**, Quebec, Canada; **L. elongates**, Canada.
- NEMATODE, Barley Root Knot, **Meloidogyne naasi**, Quebec, Canada.
- NEMATODE, Cyst. **Punctodera punctata**, NJ; **Heterodera iri**, CT, ME, MA, NH, NY, RI.
- NEMATODE, Dagger. **Xiphinema americanum**.
- NEMATODE, Gall. **Anguina agrostis**.
- NEMATODE, Lance. **Hoplolaimus coronatus**.
- NEMATODE, Lesion. **Pratylenchus brachyurus**; **P. pratensis**; **P. subpenetrans**; **P. thornei**; **P. fallax**.
- NEMATODE, Pin. **Paratylenchus projectus**.
- NEMATODE, Pseudo Root Knot. **Hypsoperine graminis**, AL, MD, TN.



- NEMATODE, Ring. *Criconemoides lobatum*; *C. rusticum*, *C. xenoplax*, *C. ornatum*, *C. parvum*, *C. curvatum*, OH; *Criconemella xenoplax*, SC.
- NEMATODE, Root Knot. *Meloidogyne* sp.; *M. incognita*; *M. spartinae*, CT, MA; *Subanguina radiculicola*, New Brunswick, Canada.
- NEMATODE, Seed Gall. *Anguina agrostis*, MN, VA.
- NEMATODE, Spiral. *Helicotylenchus nannus*; *H. dihystra*; *Rotylenchus cristiei*, FL.
- NEMATODE, Sting. *Belonolaimus gracilis*; *B. longicaudatus*, CA.
- NEMATODE, Stubby Root. *Paratrichodorus christiei*; *P. obtusa*.
- NEMATODE, Stylet. *Tylenchorhynchus brevidus*; *T. claytoni*; *T. dubius*.
- NONPARASITIC. **Burn.** Mowing too close in hot weather. **Spring Dead Spot.** Too much thatch.
- PATCH, SUMMER. *Magnaporthe poae*, OH.
- POWDERY MILDEW. *Erysiphe graminis*, general.
- RING PATCH, BROWN. *Waitea circinata* var. *circinata*, CA, MN, NJ, PA, VA, WV, WI; *Waitea circinata*, AZ, FL, British Columbia, Canada.
- ROT, Basal Stem. *Pythium sylvaticum*, IL.
- ROT, Blind Seed. *Gloeotinia temulenta*, OR.
- ROT, Crown. *Drechslera catenaria*, OH.
- ROT, Culm. *Fusarium culmorum*; *Gibberella zeae*.
- ROT; Dollar Spot; Small Brown Patch. *Sclerotinia homoeocarpa*, general.
- ROT, Foot. *Ophiobolus graminis*, NY, WA.
- ROT; Large Brown Patch. *Pellicularia filamentosa* (*Rhizoctonia solani*); widespread, more important on bentgrass than on bluegrass; *Magnaporthe poae*, FL, NC; *Ophiosphaerella agrostis*, FL, MD, MA, MS, MO, NC, OH, TX, VA (eastern seaboard).
- ROT; Pink Patch; Red Thread. *Corticium fuciforme*, general.
- ROT, Root. *Pythium debaryanum*; *P. arrhenomanes*, LA; *P. volutum*, NC; *P. ultimum*; *Fusarium* spp.; *Olpidium brassicae*; *Pyrenochaeta terrestris*, IL; crown and root, *Ophiosphaerella agrostis*, TX; *Gaeumannomyces graminis* var. *graminis*, MS.
- RUST. *Puccinia graminis* subsp. *graminicola*, OR; *Puccinia pygmaea*, NY; *Uromyces mysticus* (II, III), OR; *U. dactylidis*, IN, MI, SD, VI.
- RUST, Bluegrass. *Puccinia poae-nemoralis*, widespread; *P. recondita* on brome grass, PA; *P. striiformis*, stripe rust, OR; *P. cynodontis*, on Bermuda grass; *P. stenotaphri*, on St. Augustine grass; *P. piperi*; *P. brachypodii* and *P. striiformis* on false brome grass, Italy, Netherlands.
- RUST, Crown. *Puccinia coronata* (II, III), cosmopolitan, N. America; *P. glumarum*.
- RUST, Stem; Wheat. *Puccinia graminis*, cosmopolitan.
- SCAB. *Fusarium heterosporum*, MO.
- SLIME MOLD. *Mucilago spongiosa*; *Physarum cinereum*; *Fuligo septic*; *Labyrinthula terrestris*, CO.
- SMUT, Bluegrass Blister. *Entyloma irregulare* and other spp.
- SMUT, Flag. *Urocystis agropyri*, OH, WI.
- SMUT, Head; Bunt. *Tilletia pallida*, NJ, OH, OR; *T. fusca*; *T. buchloëana*, KS, NE, OK, TX.
- SMUT, Inflorescence. *Sorosporium syntherisma*, CA.
- SMUT, Stripe. *Ustilago striiformis*, widespread; *U. cynodontis* on Bermuda grass in South; *U. Buchloes*, TX.
- SNOWMOLD, Blight. *Fusarium nivale*, AK, MI, MN, OR, WA; *Calonectria graminicola*; *Sclerotinia borealis*, AK; *Sclerotium rhizodes*, white tip, CT, MA, NJ, PA, WI; *Typhula itoana*, MA, MN, NJ, NY, PA; *T. idahoensis*, ID.
- SPRING DEAD SPOT. *Gaeumannomyces graminis* var. *graminis*, AL, FL, NC, TX; *Ophiosphaerella herpotricha*, MS; *O. korrae*; *O. narmari*, KS, OK.
- STEM EYESPOT. *Phloeospora idahoensis*, OH.
- SUMMER PATCH. *Magnaporthe* spp., CA, CO, KS, NE, WA.
- SYMBIOTIC ENDOPHYTE. *Acremonium typhinum*, NJ.

**VIRUS. Bromegrass Mosaic.** General, IA, IL; **Clover Yellow Vein**, GA; **Maize Dwarf Mosaic**; **Peanut Mottle**, GA; **St. Augustine Decline Virus (Panicum Mosaic)**, AR, LA, TX; **Sugarcane Mosaic**, FL, IL; **Barley Yellow Dwarf**, IN, MO; **Cocksfoot Streak**; **Agropyron Mosaic**; **Grapvine Fanleaf**, CA; **Lolium Latent**, MD.

**WILT, Necrosis. Acidovorax spp.**, NC.

The possibility of any large proportion of these diseases appearing in the average suburban lawn is remote. Snowmold occurs occasionally after a winter when the snow cover has been rather continuous, but the light tan areas disappear by late spring. Large brown patch is fairly general in humid summer weather along with dollar spot, and Helminthosporium leaf spots or melting-out. Merion bluegrass is resistant to the latter but not to bluegrass rust. *Acremonium* sp. first *Clavicipitaceous* endophyte of perennial ryegrass (*Lolium perenne*) caused a hyperthermia syndrome of cattle, TX, WA.

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### Grass-Of-Parnassus (*Parnassia*)

**POWDERY MILDEW. Erysiphe polygoni**, NY.

**RUST. Puccinia parnassiae** (III), UT; **P. caricina** var. **uliginosa**, (I), AK; II, III on *Carex*.

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### Grevillea (Silk-Oak)

**DIEBACK; Gum Disease. Diplodia** sp. (*Physalospora rhodina*), FL.

**LEAF SPOT, Algal. Cephaleuros virescens**, FL.

**NEMATODE, Root Knot. Meloidogyne** sp., CA.

**ROT, Root. Phymatotrichum omnivorum**, AZ.

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### Grindelia (Gumweed)

**LEAF SPOT. Cercospora grindeliae**, CA, TX, WI; **Septoria grindeliae**, CO, KS, TX; **S. grindeliicola**, WI.

**POWDERY MILDEW. Golovinomyces cichoracearum**, MN to NM, CA, MT.

**ROT, Root. Phymatotrichum omnivorum**, TX.

**RUST. Coleosporium asterum** (II, III), CA, CO, WA, WI; 0, I on pine; **Puccinia dioicae** (0, I), KS, NE, TX; II, III on *Carex*; **P. grindeliae** (III), NE to TX, CA, MT; **P. stipae** (0, I), CO, KS, NE, ND, SD; II, III on *Stipa* and other grasses; **Uromyces junci** (0, I); II, III on *Juncus*.

**SMUT, Inflorescence. Thecaphora californica**, CA, UT; **T. Cuneata**, CO, KS, NE, NM.

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### Ground-Cherry, Husk-Tomato (*Physalis*)

**BACTERIAL Angular Leaf Spot. Pseudomonas angulata**, KY.

**BACTERIAL Canker. Vascular. Clavibacter michiganense**, WY. Also **Pseudomonas longifolia**.

**BACTERIAL, Wildfire. Pseudomonas syringae** pv. **tabaci**, PA.

**BLIGHT, Seedling. Gloeosporium fructigenum**, NY.

**BLIGHT, Southern. Sclerotium rolfsii**, FL.

**LEAF SPOT. Alternaria solani; Cercospora diffusa**, IL, KS, WI; **C. physalicola**, CT to GA, TX; **Leptosphaeria physalidis**, KY; **Phyllosticta** sp., OK; **Septoria** sp., NE; **Stemphylium solani**, FL.

**NECROSIS, Vascular. Verticillium dahliae**, NM.

**NEMATODE, Leaf and Stem. Ditylenchus dipsaci**, CA.

**NEMATODE, Root Knot. Meloidogyne** spp., AL, FL.

**POWDERY MILDEW. Sphaerotheca fusca**, CA.

**ROT, Root. Phymatotrichum omnivorum**, TX.

**RUST. Aecidium physalidis**, WI to TX, CO, NM; **Puccinia physalidis**, CO, IA, MN, NE, WI.

**SMUT, White. Entyloma australe**, MA to MS, NM, ND.

**VIRUS. Beet Curly Top; Mosaic** (part cucumber, part tobacco mosaic); **Ring Spot** (Tobacco); **Physalis Mosaic**, IL; **Potato Leafroll**, Pacific Northwest; **Tomato Spotted Wilt**, GA; **Yellowing Stunting Disorder**, CA.

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**Ground-Cherry, Purple-Flowered  
(*Quincula*)**

LEAF SPOT. *Cercospora physalidis*, KS.  
RUST. *Puccinia aristidae* (0, I), CO.

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**Ground-Ivy (*Gleoma*)**

RUST. *Puccinia glechomatis*, IN, NY.

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**Groundnut (*Apios*)**

LEAF AND STEM DISEASE. *Cercospora zebrina*  
(clover isolate), NC.  
VIRUS. **Cucumber Mosaic**, LA; **Desmodium  
Yellow Mottle**, LA.

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**Ground-Smoke (*Gayophytum*)**

LEAF SPOT. *Cercospora gayophyti*, CA.  
RUST. *Puccinia vagans* (0, I, II, III), ND to NM,  
CA, WA.  
SMUT, Seed. *Ustilago gayophyti*, CA, NV, OR,  
UT.

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**Guar (*Cyamopsis*)**

BACTERIAL Blight. *Xanthomonas campestris* pv.  
*cyamopsidis*, AZ.  
POWDERY MILDEW. *Leveillula taurica*, AZ.  
VIRUS. **Guar Symptomless**.

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**Guava (*Psidium*)**

ANTHRACNOSE; Leaf and Fruit Spot; Ripe Rot.  
**Glomerella cingulata**, FL.  
BLIGHT, Thread. *Pellicularia koleroga*, FL.  
LEAF SPOT. *Cercospora psidii*, FL.  
LEAF SPOT, Algal; Green Scurf. *Cephaleuros  
virescens*, FL.  
NEMATODE, Buitowing. *Radopholus similis*, FL.

NEMATODE, Root Knot. *Meloidogyne* sp., FL.  
ROT, Fruit. *Alternaria citri*, CA; *Rhizopus  
stolonifer*, HI.  
ROT, Root. *Clitocybe tabescens*, FL;  
*Phymatotrichum omnivorum*, TX.  
ROT, Wound. *Polyporus versicolor*, FL.  
SCAB. *Pestalotiopsis* spp., HI.

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**Guayule (*Parthenium*)**

ROT, Root. *Pythium aphanidermatum*, AZ.

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**Gypsophila (Baby's-Breath)**

BACTERIAL Fasciation. *Clavibacter fascians*, OH.  
BACTERIAL, MLO. **Aster Yellows**, NY, and **Califor-  
nia Aster Yellows**, CA.  
BACTERIAL Root and Stem Gall. *Erwinia  
herbicola* (*Agrobacterium gypsophilae*), NJ.  
BLIGHT, Gray Mold. *Botrytis cinerea*, NJ.  
DAMPING-OFF. *Pythium debaryanum*, CT;  
*Rhizoctonia solani*, CT.  
NEMATODE, Root Knot. *Meloidogyne* sp., FL.  
ROOT ROT. *Phytophthora dreschleri*, NC.  
WILT. *Phytophthora cactorum*, MA.

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**Hackberry, Sugarberry (*Celtis*)**

BLIGHT, Leaf. *Cylindrosporium defoliatum*, TX.  
BLIGHT, Thread. *Pellicularia koleroga*, FL.  
CANKER, Felt Fungus. *Septobasidium burtii*,  
TX; *S. sydowii*, TX.  
DOWNY MILDEW. *Pseudoperonospora celtidis*,  
GA, MD.  
LEAF SPOT. *Cercospora celtidis*, AL, TX, cen-  
tral states; *Cylindrosporium celtidis*,  
AL; *Phloeospora celtidis*, MA to TX;  
*Phyllosticta celtidis*, general; *Septogloeum  
celtidis*, NY.  
MISTLETOE. *Phoradendron tomentosum* and  
*P. serotinum* (*flavescens*), southeastern and  
Gulf states.  
POWDERY MILDEW. *Sphaerotheca  
phytoptophila*, associated with gall mites

causing witches' broom, widespread, especially in central states; **Uncinula macrospora**, FL, GA; **U. parvula**, widespread; **U. polychaeta**, in South.

ROT, Root. **Armillaria mellea**, occasional; **Helicobasidium purpureum**, seedling blight, TX; **Phymatotrichum omnivorum**, TX; **Poria ambigua**, TX.

ROT, Wood. **Daedalea** spp.; **Fomes** spp.; **Ganoderma lucidum**; **Polyporus** spp.; **Stereum bicolor**, cosmopolitan.

VIRUS. **Island Chlorosis**, IL; **Hackberry Leaf Mosaic**; **Angular Yellow Leaf Spot**, MN.

Hackberry witches' broom, so prominent in a winter landscape, are caused by gall mites in association with powdery mildew. There is no real control, except to cut off unsightly branches. Chinese hackberry and southern hackberry are less susceptible.

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### Halesia (Silver-Bell, Snowdrop-Tree)

LEAF SPOT. **Cercospora halesiae**, TN; **Cristulariella moricola**, Zonate Leaf Spot, LA.

ROT, Wood. **Polyporus halesiae**, GA.

Other fungi are reported on twigs and branches but not as causing specific diseases.

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### Hamelia (Scarlet-Bush)

ROT, Root. **Clitocybe tabescens**, FL.

RUST. **Uredo hameliae**, FL.

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### Harbinger-Of-Spring (*Eriogenia*)

RUST. **Puccinia eriogeniae** (0, I, III), OH.

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### Hardenbergia

NEMATODE, Root Knot. **Meloidogyne** sp.

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### Hardy Orange (*Poncirus*)

ANTHRACNOSE; DIEBACK. **Glomerella cingulata**, Gulf states.

CANKER; DIEBACK. **Diaporthe citri**, melanose, Gulf states; **Diplodianatalensis**, gummosis, general.

ROT, Root. **Phymatotrichum omnivorum**, TX; **Xylaria polymorpha**, LA.

SPOT ANTHRACNOSE; Citrus Scab. **Elsinoë fawcettii**, MS.

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### Hares-Tail (*Lagurus*)

RUST. **Puccinia coronata** (II, III), crown; **P. graminis**, stem, WA.

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### Hawkbit, Fall Dandelion (*Leontodon*)

BACTERIAL, MLO. **Aster Yellows**, ME, NY.

RUST, **Puccinia hieracii** (0, I, II, III), ME, NH.

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### Hawksbeard (*Crepis*)

LEAF SPOT. **Cercospora stromatis**, CO; **Phyllosticta eximia**, CO; **Ramularia crepidis**, NM.

POWDERY MILDEW. **Golovinomyces cichoracearum**, NE, PA; **Sphaerotheca macularis**, WY.

RUST. **Puccinia crepidis-montanae** (0, I, II, III), CO, ID, MT, OR, UT, WA, WY; **P. hieracii**, ND to CO, WA; II, III on *Carex*.

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### Hawkweed (*Hieracium*)

BLIGHT, Stem. **Phoma hieracii**, TX.

DOWNY MILDEW. **Bremia lactucae**, WI.

LEAF SPOT. **Cercospora hieracii**, AL, NC; **Phyllosticta decidua**, WI; **Septoria cercosperma**, TX; **S. hieracicola**, NY.

POWDERY MILDEW. **Golovinomyces cichoracearum**, PA, TX; **Sphaerotheca macularis**, IL.

ROT, Root. **Phymatotrichum omnivorum**, TX.

RUST. **Puccinia dioicae** (0, I), PA to IL, CA, MT, OR, WI; II, III on *Carex*; **P. fraseri** (III), MT, NE, NY, NH, PA, TN, VA, WV; **P. hieracii** (0, I, II, III), ME to VA, CA, CO FL, IL, TX, WA; **P. columbiensis**, OR, TX, WA; **Aecidium columbiense** (0, I), CA, ID, OR, WA.

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### Hawthorn (*Crataegus*)

BACTERIAL Fire Blight. **Erwinia amylovora**, widespread, especially on English hawthorn.

BLIGHT, Leaf. **Fabraea thuemenii** (*F. maculata*, *Entomosporium thuemenii*), East and central states, southward.

BLIGHT, Leaf; Fruit Spot. **Monilinia johnsonii**, NY to MN.

BLIGHT, Seedling. **Sclerotium rolfsii**, FL.

CANKER, Felt Fungus. **Septobasidium** spp., Southeast and Gulf states.

LEAF SPOT. **Cercospora apiifoliae**, TX; **Cercospora mirabilis**, CO, NY, WI; **Coniothyrium pyrinum**, IL; **Cylindrosporium brevispina**, CA to MT, WA; **C. crataegi**, WA; **Gloeosporium crataegi**, WA; **Hendersonia crataegicola**, AL, TX; **Monochaetia crataegi**, FL; **Phyllosticta** spp., widespread; **Septoria crataegi**, MI to ND; **Mycosphaerella** sp., GA.

MISTLETOE. **Phoradendron serotinum** (*flavescens*), TX; **Viscum album**, CA.

POWDERY MILDEW. **Podosphaera oxycanthae**, East and central states; **Phyllactinia corylea**, general.

ROT, Gray Mold, on fruit. **Botrytis cinerea**, AK.

ROT, Root. **Armillaria mellea**, OK; **Phymatotrichum omnivorum**, TX. **Xylaria digitata**; **X. hypoxylon**, IN, OH.

ROT, Wood. **Daedalea confragosa**, cosmopolitan; **Polyporus versicolor**, cosmopolitan; **Fomes** spp.

RUST. **Gymnosporangium bethelii** (0, I), on fruits; ND to WA, CO, NM; III on juniper;

**G. clavipes**, quince rust (0, I), on leaves, fruits, general, east of Rocky Mts.; **G. exiguum**, on leaves, fruits, TX; II, III on juniper; **G. floriforme**, on leaves, SC to FL, OK, TX; III on red-cedar; **G. globosum**, hawthorn rust (0, I) on leaves, ME to ND, FL, TX; II, III on juniper; **G. hyalinum** (0, I), leaves, Atlantic Coast, NC to FL; III unknown; **G. libocedri** (0, I), leaves and fruit, Pacific Coast; III on *Libocedrus*; **G. nelsonii** (0, I), on leaves, fruits, WY; III on juniper; **G. trachysorum** (0, I), on leaves, Atlantic and Gulf coasts; III on red-cedar; **G. tubulatum** (0, I), on leaves, Rocky Mts. to OR and WA.

SCAB. **Venturia inaequalis**, widespread; **V. crataegi**, FL.

Rusts are common on hawthorn and particularly so in the central states, where junipers should be kept at a distance. Leaf blight, beginning in a moist spring, causes spotting and defoliation in August. When branches die back from fire blight, cut them off several inches below the visible blighted portion.

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### Hazelnut, Filbert (*Corylus*)

BACTERIAL Blight. **Xanthomonas corylina**, OR, WA; **Pseudomonas syringae** pv. *coryli*.

BACTERIAL Crown Gall. **Agrobacterium tumefaciens**, WA.

BACTERIAL Spot. **Pseudomonas columnae**, IL.

BLIGHT, Eastern Filbert. **Anisogramma anomala**, NJ, NY, OR, WA.

CANKER; Twig Blight. **Apioportha anomala**, eastern and central states; **Hymenochaete agglutinans**, ME; **Gloeosporium** sp.

FILBERT STUNT. Undetermined causal agent, OR.

KERNEL SPOT; Yeast Spot. **Nematospora coryli**, OR.

LEAF BLISTER. **Taphrina coryli**, CT, MA, WI.

LEAF SPOT. **Cercospora corylina**, OK; **Cylindrosporium vermiforme**, WI; **Gloeosporium coryli**, ME to NJ, OR, PA, WA; **Phyllosticta coryli**, widespread; **Septogloeum profusum**, IN, MA, MS; **Septoria corylina**, MA to NJ, OR, WA, WI;

**Sphaerognomonia carpinea**, GA;  
**Gnomoniella coryli**, general; **Alternaria arborescens**, **A. alternata**, **A. tenuissima** (leaf spot and brown/gray apical necrosis), AZ.

NONPARASITIC. **Bitter Pit** and **Brown Stain** of nuts. Cause unknown, OR, WA. **Shrivel**, "Blanks." Defective pollination, OR, WA.

POWDERY MILDEW. **Phyllactinia corylea**, north-eastern and north central states, OR, WA; **Microsphaera alni**, northeastern and north central states; **P. gutata**, WA.

ROT, Root. **Armillaria mellea**, CA, OR, WA; **Phymatotrichum omnivorum**, TX.

ROT, Wood. **Poria ferrea**, CA.

VIRUS. **Apple Mosaic**, OR; **Clover Yellow Edge** **Phytoplasma**, OR.

Bacterial blight often kills young trees in Washington and Oregon. Powdery mildew is important in the Northwest.

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## Heath (*Erica*)

POWDERY MILDEW. **Erysiphe polygoni**, CA.

ROT, Collar. **Phytophthora cinnamomi**, CA, NY.

ROT, Root and Crown. **Cylindrocladium pauciramosum**, CA.

ROT, Stem. **Ascochyta** sp., NJ.

RUST. **Pucciniastrum ericae** (II), CA.

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## Heather (*Calluna*)

NONPARASITIC. **Chlorosis**. Iron deficiency, corrected by spraying with ferrous sulfate.

ROT, Root, Collar. **Phytophthora cinnamomi**, CA, OR.

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## Hebe

BACTERIAL Fasciation. **Clavibacter fascians**, CA.

LEAF SPOT. **Septoria exotica**, CA.

ROT, Root. **Armillaria mellea**, CA.

WILT. **Fusarium oxysporum** f. sp. **hebae**, CA.

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## Hedge Parsley (*Torilis*)

GALL, Leaf. **Protomyces macrosporus**, AR.

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## Helenium (Sneezeweed)

BACTERIAL, MLO. **Aster Yellows**, NY, and **California Aster Yellows**, CA.

LEAF SPOT. **Cercospora helenii**, AL, TX; **Septoria helenii**, IA, PA, TX.

POWDERY MILDEW. **Golovinomyces cichoracearum**, CO, OR, TX, UT, WA, WI, WY.

ROT, Root. **Phymatotrichum omnivorum**, TX.

RUST. **Puccinia conspicua** (0, I), AZ, CO, NM; II, III on *Koeleria*, **P. dioicae** (0, I), CO, NE, TX; II, III on *Carex*.

SMUT. **Entyloma compositarum**, TX, WI; **E. polysporum**, MT.

VIRUS. **Helenium S. Carlavirus**.

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## Helichrysum

► **Strawflower**.

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## Heliopsis

BACTERIAL, Proliferation. **Rhodococcus fascians**, OR.

BLACK KNOT. **Gibberidea heliopsisidis**.

LEAF SPOT. **Phyllosticta pitcheriana**, NY; **Septoria helianthi**, IN; **S. heliopsisidis**, WI.

POWDERY MILDEW. **Golovinomyces cichoracearum**, IA, MN, NE, NM, ND, WI; **Leveillula taurica**, IA.

ROT, Root. **Phymatotrichum omnivorum**, TX.

RUST. **Coleosporium helianthi** (II, III), NC; 0, I on pine; **Puccinia batesiana** (0, I, III), DE, IA, KS, MD, MN, NE, PA, WI; **P. helianthi** (0, I, II, III), IN, MN, NC, PA, VA.

VIRUS. **Mosaic**. Unidentified, IA.

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### Heliotrope (*Heliotropium*)

BLIGHT, Shoot; Leaf Spot. **Botrytis cinerea**, cosmopolitan; **Stemphylium** sp., NY.

LEAF SPOT **Cercospora heliotropii**, NM, OR.

NEMATODE, Root Knot. **Meloidogyne** sp., MA, WA.

RUST. **Puccinia aristidae** (0, I), AZ, CA, NV, NM, TX, UT; II, III on grasses.

WILT. **Verticillium albo-atrum**, MD.

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### Hemlock (*Tsuga*)

BLIGHT, Needle. **Didymascella tsugae**, MA, NH, WI; **Rosellinia herpotrichioides**, NC.

BLIGHT, Shoot Tip. **Sirococcus tsugae**, GA.

BLIGHT, Snow. **Herpotrichia nigra**, MT to OR, AK.

BLIGHT, Twig. **Botrytis cinerea**, ID.

CANKER, Bleeding. **Phacidiopycnis pseudotsugae** (*Phacidiella coniferarum*) on eastern hemlock.

CANKER, Branch. **Discocainia trelesi** on western hemlock, AK, WA.

CANKER, Stem Girdle, of saplings. **Hymenochaete agglutinans**, PA.

CANKER, Twig. **Cytospora** sp., MD, VA; **Dermatea balsamea**, GA, NY, TN, VA.

DAMPING-OFF. **Rhizoctonia solani**, cosmopolitan.

MISTLETOE, Dwarf. **Arceuthobium campylopodium**, AK, ID; **A. cyanocarpum**, OR; **A. tsugense**, AK; **A. laricis**, WA; **A. abietinum**, OR.

NONPARASITIC. **Canker**; Bark Split. Heavy soil and poor drainage.

ROT, Root. **Armillaria mellea**, MA to PA, MI, OR, WA; **Phymatotrichum omnivorum**, TX; **Fusarium solani**, PA; **F. oxysporum**, PA; **F. avenaceum**, PA; **Phytophthora citricola**, NC.

ROT, Seedling Root. **Cylindrocladium scoparium**, NY; **Rhizina undulata**, NY.

ROT, Wood. **Fomes** spp.; **Ganoderma lucidum**, Northeast; **Polyporus** spp., general.

RUST, Needle, Cone. **Caecoma dubium** (0, I), ID, MT, OR, WA; **Melampsora abietis-canadensis**

(0, I), New England to PA; II, III on poplar; **M. farlowii** (III), New England to NC, WI; **Pucciniastrum hydrangeae** (0, I), IN, MD, PA, TN; II, III on hydrangea; **P. myrtilli** (0, I), ME to AL, IN, WI; II, III on *Ericaceae*; **Uraecium holwayi** (0, I), AK, MT, OR, WA; **Thekopsora minima**.

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### Hemp (*Cannabis*)

BLIGHT, Gray Mold. **Botrytis cinerea**, OR, VA.

BLIGHT, Southern. **Sclerotium rolfsii**, SC, TX.

BROOMRAPE. **Orobanche ramosa**, CA, IL, KY, WI. CANKER, **Sclerotinia sclerotiorum**, Canada.

CANKER; Stem Rot. **Gibberella quinqueseptata**; **G. saubineti**, IN, VA.

CANKER; Stem Wilt. **Botryosphaeria marconii**, MD, VA.

LEAF CURL, Wilt. **Cercospora cannabina**, MS.

LEAF SPOT. **Cylindrosporium** spp., MD; **Septoria cannabis**, MD to KY, FL, IA, MN, TX; **Cercospora cannabis**, MS.

NEMATODE, Root Knot. **Meloidogyne** sp., TN.

POWDERY MILDEW. **Golovinomyces cichoracearum**, FL.

ROT, Charcoal. **Macrophomina phaseoli**, IL.

ROT, Root. **Phymatotrichum omnivorum**, TX; **Hypomyces cancri**, MD.

ROT, Stem; Wilt. **Sclerotinia sclerotiorum**, MT.

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### Hempsesbania (*Sesbania*)

CANKER, STEM. **Diaporthe phaseolorum** var. **caulivora**, LA.

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### Henbit (*Laminum*)

ROT. **Sclerotinia minor**, NC.

VIRUS. **Tomato Ringspot**, PA.

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### Hepatica

DOWNY MILDEW. **Plasmopara pygmaea**, IA, IL, NY, PA, WI.

LEAF SPOT. *Discosia artocreas*, secondary, IA; *Septoria hepatica*, MI, NC.  
 RUST. *Tranzschelia pruni-spinosae* (0, I), MA to MD, TN, MN; II, III on wild plum.  
 SMUT, Leaf and Stem. *Urocystis anemones*, NY to IN, MO, MN, WI.

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### Heracleum (Cow-Parsnip)

LEAF SPOT. *Cylindrosporium heraclei*, CA, CO, ID, MT, ND, TX, UT, WA, WY; *Fusicladium angelicae*, WI; *Phyllosticta heraclei*, AK, OR, TX; *Ramularia heraclei*, general.  
 ROT, Root. *Phymatotrichum omnivorum*, TX.

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### Hercules-Club (*Aralia spinosa*)

CANKER; DIEBACK. *Botryosphaeria ribis*, GA, VA, WV; *Nectria cinnabarina*, VA, WV.  
 LEAF SPOT. *Cercospora atromaculans*, LA, TX; *Phyllosticta araliae*, TX; *P. everhartii*, TX, WV; *Stagonospora* sp., WV.  
 ROT, Root. *Phymatotrichum omnivorum*, TX; *Rhizoctonia solani*, TX.  
 ROT, Sapwood. *Polyporus tulipiferae*, MD.  
 SPOT ANTHRACNOSE. *Sphaceloma araliae*, MD, MO.

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### Hercules-Club (*Zanthoxylum clava-herculis*)

LEAF SPOT. *Cercospora xanthoxyli*, FL, GA, TX; *Septoria pachyspora*, TX.  
 MISTLETOE. *Phoradendron serotinum* (*flavescens*), TX.  
 RUST. *Puccinia andropogonis* var. *xanthoxyli* (0, I) FL, TX; II, III on *Andropogon*.

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### Heronbill (*Erodium*)

BACTERIAL, MLO. California Aster Yellows.  
 BLIGHT, Southern. *Sclerotium rolfsii*, TX.  
 DOWNY MILDEW. *Pseudoperonospora erodii*, MT, TX.

GALL, Leaf. *Synchytrium papillatum*, AZ, CA, OR, TX.  
 ROT, Root. *Rhizoctonia solani*, TX.  
 VIRUS. **Beet Curly Top**, CA; **Filaree Red Leaf**, CA.

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### Hesperis (Dames-Rocket)

CLUB ROOT. *Plasmodiophora brassicae*, NJ.  
 DOWNY MILDEW. *Peronospora parasitica*, NY, PA.  
 VIRUS. Cucumber Mosaic, OR.  
 WHITE RUST; White Blister. *Albugo candida*, NY.

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### Heuchera (Alum-Root, Coral-Bells)

LEAF NEMATODE. *Aphelenchoides fragariae*, CA.  
 LEAF SPOT. *Cercospora heucherae*, IL, IN, IA, OH, PA, VA, WV, WI; *Phyllosticta excavata*, AK, ID; *Ramularia mitellae* var. *heucherae*, WA; *Septoria heucherae*, IN.  
 POWDERY MILDEW. *Golovinomyces cichoracearum*, CA; *Sphaerotheca macularis*, MT, NM; *Phyllactinia corylea*, MT.  
 ROT, Root. *Phytophthora cinnamomi*, NC; *Pythium hypogynum* and *P. ultimum*.  
 RUST. *Puccinia heucherae* (III), PA to NC, AK, SD, western states.  
 SMUT, Leaf and Stem. *Urocystis lithophragmae*, UT.  
 VIRUS. **Tobacco Rattle**, MA, MI, MN.

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### Hibbertia (Guinea-Gold-Vine)

VIRUS. **Cucumber Mosaic**, CA, SC.

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### Hibiscus (Arborescent Forms) (Rose-of-Sharon, Confederate-Rose, Chinese Hibiscus, Kenaf)

BACTERIAL Crown Gall. *Agrobacterium tumefaciens*, MS.



- BACTERIAL Leaf Spot. ***Pseudomonas syringae***, CA, FL; ***P. syringae* pv. *hibisci***, FL; ***Xanthomonas campestris* pv. *malvacearum***, FL.
- BACTERIAL Wilt. ***Xanthomonas solanacearum***, FL.
- BLIGHT, Blossom. ***Choanephora infundibulifera***, FL.
- BLIGHT, Leaf Stem. ***Phytophthora palmivora***, LA; ***P. parasitica***, FL.
- BLIGHT, Thread. ***Pellicularia koleroga***, FL; web, ***P. filamentosa***, FL.
- CANKER; DIEBACK. ***Colletotrichum hibisci***, FL, TX.
- LEAF SPOT. ***Alternaria tenuis***, IN, NJ, PA; ***Cercospora hibisci***, FL, OK, TX; ***C. amalayensis***, GA; ***Phyllosticta hibiscina***, LA; ***Cristulariella pyramidalis***, FL, GA, MD, MS; ***C. moricola***, LA.
- NEMATODE, Leaf. ***Aphelenchoides fragariae***, FL.
- NEMATODE, Root Knot. ***Meloidogyne* spp.**, MS, TX.
- NONPARASITIC. **Strapleaf**. Molybdenum deficiency, FL.
- POWDERY MILDEW. ***Leveillula taurica***, TX.
- ROT, Root. ***Clitocybe tabescens***, FL; ***Phymatotrichum omnivorum***, TX.
- ROT, Stem. ***Fusarium* sp.**, FL; ***Phytophthora parasitica***, TX; ***P. cactorum***, LA; ***P. palmivora***, LA; ***Sclerotinia sclerotiorum***, NY.
- RUST. ***Kuehneola malvicola* (II, III)**, Gulf states.
- STUNTING. ***Hoplolaimus magnistylus***, MS.
- VIRUS. **Mosaic**, unidentified, FL; **Hibiscus Chlorotic Ringspot**; **Tomato Spotted Wilt**, TX; **Potato Leaf Roll**, Pacific Northwest; **Hibiscus Latent Fort Pierce**, NM.
- CANKER; DECLINE, Bitternut. ***Fusarium solani*** and ***Ceratocystis smalleyi***, IA, MN, WI.
- CANKER, Bark Patch. ***Aleurodiscus candidus***, MO, OH, PA; ***Solenia ochracea***, MA.
- CANKER, Felt Fungus. ***Septobasidium* spp.**, Southeast.
- CANKER, Heart Rot. ***Poria spiculosa***, destructive to pignut, shagbark, PA, and South.
- CANKER, Twig. ***Rosellinia caryae***, MI; ***Botryosphaeria berengeriana***.
- GALL, Trunk, Branch. ***Phomopsis* sp.**, eastern states.
- LEAF SPOT. ***Fusarium carpineum***, WI; ***Hendersonia davisii***, WI; ***Marssonina juglandis* (*Gnomonia leptostyla*)**, NJ, NC to IA; ***Microstroma juglandis***, Witches' Broom; ***Monochaetia desmazierii***, MD to NC, TN; ***Mycosphaerella carigena***, WI; ***Pestalotia sphaerelloides***, LA; ***Phyllosticta caryae***, widespread; ***Septoria caryae***, DE, MI; ***S. hickoriae***, TX; ***Cercospora fusca***.
- MISTLETOE. ***Phoradendron serotinum* (*flavescens*)**, IN, TX; ***Viscum album***, CA.
- NEMATODE, Root Knot. ***Meloidogyne* sp.**
- NONPARASITIC. **Rosette**. Zinc deficiency, southern states.
- POWDERY MILDEW. ***Phyllactinia corylea***, MI, WI; ***Microsphaera alni***, cosmopolitan.
- ROT, Heart. ***Favolus alveolaris***, NY, VT, VA; ***Fomes* spp.**, cosmopolitan.
- ROT, Root. ***Armillaria mellea***, cosmopolitan; ***Clitocybe parasitica***, OK; ***Phymatotrichum omnivorum*** AZ, TX; ***Helicobasidium purpureum***.
- ROT, Wood. ***Daedalea* spp.**; ***Ganoderma curtisii***; ***Polyporus* spp.**; ***Steccherinum septentrionale***; ***Schizophyllum commune***; ***Stereum hirsutum***; ***Trametes rigida***.
- SCAB; Leaf Spot. ***Cladosporium effusum***, general.
- SPOT ANTHRACNOSE. ***Elsinoë randii***.
- WILT. ***Verticillium* sp.**, VA.

Of the various leaf spots on hickory, anthracnose caused by *Gnomonia caryae* is the most destructive. There are no recommended control measures for witches' broom appearing on shagbark hickory except cutting them out.

## Hickory (*Carya*)

- ANTHRACNOSE; Leaf Spot. ***Gnomonia caryae***, general (see under ► [Leaf Spots](#)).
- BACTERIAL Crown Gall. ***Agrobacterium tumefaciens***, KS, MD, TX.
- BLOTCH, Leaf. ***Mycosphaerella dendroides***, widespread East and South.
- CANKER. ***Nectria galligena*** and ***Ceratocystis smalleyi***, eastern U.S.; ***Strumella coryneoidea***, MD, PA.

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## Hippeastrum

► Amaryllis.

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## Hoarhound (*Marrubium*)

GALL, Leaf. *Synchytrium marrubii*, TX.

LEAF SPOT. *Cercospora marrubii*, OK, TX.

NEMATODE, Root Knot. *Meloidogyne* sp., AL.

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## Hoary-Tick Clover (*Desmodium*)

ROT, BLACK. *Cylindrocladium parasiticum*, FL.

VIRUS. Cowpea Mosaic, IL; *Desmodium* Mosaic, FL; *Desmodium* Yellow Mottle, AR.

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## Holly (*Ilex*) (*Ilex opaca*, American; *I. equifolium*, English; *I. cornuta*, Chinese; *I. crenata*, Japanese)

BACTERIAL Blight. *Clavibacter ilicis*, MA.

BLACK MILDEW. *Asterina* (*Englerulaster*) *orbicularis*, DE to FL, TX; *A. ilicis*; *A. pelliculosa*; *Morenoella* (*Lembosia*) *ilicis*, Gulf states.

BLIGHT, Flower. *Botrytis cinerea*, NJ.

BLIGHT, Leaf and Twig. *Phytophthora ilicis*, OR, WA.

BLIGHT, Thread. *Pellicularia koleroga*, LA; silky thread, *Rhizoctonia ramicola*; web, *Cylindrocladium scoparium*, AL.

CANKER; DIEBACK. *Boydia insculpta*, secondary, OR, WA; *Diaporthe eres*, secondary; *Diplodia* sp., MD; *Nectria coccinea*; *Phomopsis* sp.; *Physalospora ilicis* on twigs, also leaf spot, CA, NJ, NY, NC, SC, TX, WA, WV; *Gloeosporium* sp., AL.

CANKER, Felt Fungus. *Septobasidium* spp., FL, LA, NC.

DODDER. *Cuscuta compacta*, FL; *C. exaltata*, TX.

LEAF SPOT. *Cercospora ilicis*, NJ and Gulf states; *Gloeosporium aquifolli*, NJ, TX, WA;

*Macrophoma phacediella*, NJ; *Microthyriella cuticulosa*, black spot; *Phyllosticta concomitans*, LA; *P. terminalis*, MS; *Septoria ilicifolia*, NJ; *Cuticularia ilicis*, OR; *Sclerophoma* sp., OR.

LEAF SPOT. *Sclerophoma* sp., Kentucky on English Holly (*Ilex aquifolium*).

LEAF SPOT, Tar. *Phacidium curtisii*, MA to FL, TX; *Rhytisma ilicinicum*, VA to GA, TN; *R. velatum*, GA, MS, SC.

LEAF SPOT; Twig Dieback. *Cylindrocladium avesciculatum*, GA.

NEMATODE, Lance. *Hoplolaimus uniformis*, RI.

NEMATODE, Root Knot. *Meloidogyne incognita*; *M. incognita*; *M. arenaria*, NC; *M. hapla*; *M. javanica*.

NONPARASITIC. Leaf Blotch. Purplish blotches associated with soil deficiencies and drought or winter injury.

Chlorosis. Mineral deficiency from excess of lime.

Spine Injury; Copper Spray Injury; Boron Deficiency.

POWDERY MILDEW. *Microsphaera alni*, AL, FL, IL, NC; *Phyllactinia corylea*, TN.

ROT, Leaf. *Rhizoctonia solani*, of cuttings.

ROT, Root. *Clitocybe tabescens*, FL; *Phymatotrichum omnivorum*, TX; *Corticium galactinum*, white root, MD.

ROT, Wood. *Daldinia vernicosa*, MD; *Daedalea confragosa*, MD; *Polyporus* spp.; *Stereum* spp., MD; *Ustulina deusta*, MD; *Poria* spp.; *Pleurotus ostreatus*, MD.

RUST. *Chrysoomyxa ilicina* (II, III), NC, TN, WV, 0, I unknown.

SOOTY MOLD. *Capnodium elongatum*, Gulf states; *Fumago vagans*, OR, WA.

SPOT ANTHRACNOSE. *Elsinoë ilicis*, PA, on Chinese holly.

None of these diseases is as important to the average gardener as the holly leaf miner. Spraying is necessary for that insect but seldom obligatory for the various leaf spots. The most common leaf discoloration is a purplish blotch due to environment rather than a fungus. Proper growing conditions and correct soil acidity are important. Pick off occasional spotted leaves; prune out blighted branches.

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**Hollyhock (*Althaea*)**

ANTHRACNOSE. *Colletotrichum malvarum*, NY to MS, IA, TX.

BACTERIAL Hairy Root. *Agrobacterium rhizogenes*, WI.

BACTERIAL Wilt. *Pseudomonas solanacearum*, NY, WV.

BLIGHT, Southern. *Sclerotium rolfsii*, AR.

BLIGHT, Web. *Pellicularia filamentosa*, TX.

CANKER. *Nectria cinnabarina*, OK.

LEAF SPOT. *Alternaria* spp., secondary; *Ascochyta althaeina*, IN, MD, NJ, NY, PA, WV; *Cercospora althaeina*, East and central states to AL, SD, TX; *C. kellermanii*, IN, MD, MN, MO, NJ, OH; *Myrothecium roridum*, MD; *Septoria malvicola*, MI, MN, NY, OH, OK, VT, WI.

NEMATODE, Lesion. *Pratylenchus pratensis*, TX.

NEMATODE, Root Knot. *Meloidogyne* spp., FL, KS, MS, OK, TX.

POWDERY MILDEW. *Golovinomyces cichoracearum*, CA, MS; *Erysiphe polygoni*, IA.

ROT, Crown. *Phytophthora megasperma*, MD, VA; *Sclerotinia sclerotium*, MT, NJ.

ROT, Root. *Phymatotrichum omnivorum*, TX.

RUST. *Puccinia malvacearum* (III), general; *P. heterospora* (III), CA, KS, MS, TX; *P. lobata*, AZ, NM, TX; *P. schedonnardi* (0, I), KS, MS, NE, ND; *P. sherardiana* (0, III), CA; *Endophyllum tuberculatum* (III), CO, KS, NE, OK.

VIRUS. **Hollyhock Mosaic.**

Rust is by far the most destructive disease of hollyhocks, disfiguring foliage in most seasons and some years causing nearly all leaves to shrivel and die. Remove infected leaves and stalks as noticed.

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**Holly Osmanthus (*Osmanthus ilicifolius*)**

LEAF SPOT. *Phyllosticta oleae*, TX.

NEMATODE, Root Knot. *Meloidogyne* sp.

ROT, Root. *Phymatotrichum omnivorum*, TX; *Rosellinia necatrix*, CA.

SOOTY MOLD. *Capnodium elongatum*, TX; *Fumago salicina*, TX.

WILT. *Verticillium albo-atrum*, VA.

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**Holly, West Indian (*Leea coccinea*)**

LEAF SPOT, Blight, Defoliation. *Phytophthora meadii*, HI.

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**HOLIDISCUS (Ocean Spray, Rock-Spirea)**

CANKER, Twig; Coral Spot. *Nectria cinnabarina*, WA.

LEAF SPOT. *Cylindrosporium ariaefolium*, OR; *Rhopalidium cercosporelloidis*, ID; *Septogloeum schizonoti*, WA.

POWDERY MILDEW. *Podosphaera oxyacanthae*, ID; *Phyllactinia corylea*, WA.

VIRUS. **Holidiscus Witches' Broom**, OR, WA.

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**Homalomena**

LEAF SPOT. *Glomerella cincta*, NJ.

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**Honesty (*Lunaria*)**

CLUB ROOT. *Plasmodiophora brassicae*, NJ.

LEAF SPOT. *Alternaria oleracea*, black spot of leaves, pods; *Helminthosporium lunariae*, MA.

ROT, Root; Damping-off. *Aphanomyces raphani*, WI.

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**Honey Locust (*Gleditsia*)**

BACTERIAL Hairy Root. *Agrobacterium rhizogenes*, central states.

CANKER. *Dothiorella* sp., MS; *Cytospora gleditschiae*, IL; *Physalospora obtusa*.

CANKER, Felt Fungus. *Septobasidium curtisii*, AR, LA.

CANKER, Stem and Branch. **Kaskaskia gleditsiae**, IL; **Tubercularia ulmea**, ND; **Nectria cinnabarina**, MN; **Thyronectria austro-americanana**, KS, NC.

CANKER; Wilt. **Thyronectria austro-americanana**, CA, MA; **T. denigrata**, MA to SC, CA, LA, NE.

LEAF SPOT. **Cercospora condensata**, IL to KS, NE, WI.

LEAF SPOT, Tar. **Linospora gleditsiae**, SC, NC to NE, TX.

MISTLETOE. **Phoradendron serotinum (flavescens)**, IN, TX.

POWDERY MILDEW. **Microsphaera alni**, widespread.

ROT, Crown. **Phytophthora citrophthora**, CA.

ROT, Root. **Phymatotrichum omnivorum**, OK, TX; **Xylaria mali**, VA.

ROT, Wood. **Fomes** spp., widespread; **Daedalea ambigua**; **D. elegans**; **Ganoderma curtisii** and **G. lucidum**; **Polyporus** spp.; **Schizophyllum commune**.

RUST. **Ravenelia opaca** (III), IL.

VIRUS. **Robinia Brooming**, KY, OH.

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### Honey Plant, Bitterbush (*Picramnia*)

SPOT, Tar. **Phyllachora domingensis**, FL.

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### Honeysuckle (*Lonicera*)

BACTERIAL Crown Gall. **Agrobacterium tumefaciens**, CT.

BLIGHT, Gray Mold. **Botrytis cinerea**, AK, CT.

BACTERIAL Hairy Root. **Agrobacterium rhizogenes**, central states.

BLIGHT, Leaf. **Herpobasidium deformans**, CT, IA, NY, WI.

BLIGHT, Sudden Oak Death. **Phytophthora ramorum**, CA.

BLIGHT, Thread. **Pellicularia koleroga**, LA.

BLIGHT, Twig. **Phoma mariae**, CT, MA, NY.

LEAF SPOT. **Cercospora antipus**, MI to MT, TX; **C. varia**, TX; **Guignardia lonicerae**, CA; **Kabatia lonicerae**, CA; **Lasiobotrys affinis**, CA; **L. lonicerae**, Black Spot, OR;

**Leptothyrium periclymeni**, widespread; **Marssonina lonicerae**, CA; **Mycosphaerella clymenia**, VA; **Septoria sambucina**, MT, WI; **S. xylostei**, WI.

NEMATODE, Root Knot. **Meloidogyne** sp.

POWDERY MILDEW. **Microsphaera alni**, general; **Erysiphe polygoni**, CA, WY.

ROT, Collar, Wood. **Fomes** spp.

ROT, Root. **Armillaria mellea**, NJ; **Phymatotrichum omnivorum**, TX.

RUST. **Puccinia festucae** (I), IL, IA.

VIRUS. **Mosaic**, MD; **Tobacco Streak**, MD.

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### Hop (*Humulus*)

ANTHRACNOSE; Leaf Spot. **Colletotrichum** sp.; **Glomerella cingulata**, IN, KS, MD, NY, OR, WA, WI.

BACTERIAL Crown Gall. **Agrobacterium tumefaciens**, CA, OK, OR, WA.

BLIGHT, Cone Tip. **Fusarium sambucinum**, **F. avenaceum**, OR.

DOWNY MILDEW. **Pseudoperonospora humuli**, CA, NY, OR, WA, WI, Argentina.

LEAF SPOT. **Cercospora** sp., NE; **Cylindrosporium humuli**, NY to NC, IA, WI; **Phyllosticta decidua**, IA, WI; **P. humuli**, IA, MA, MI; **Mycosphaerella erysiphina**, CA; **Septoria humuli**, NH; **S. lupulina**, KS.

NEMATODE, Root Knot. **Meloidogyne** sp., CA.

POWDERY MILDEW. **Golovinomyces cichoracearum**; **Sphaerotheca macularis**, general.

ROT, Root. **Armillaria mellea**, OR.

RUST. **Aecidium** sp., WA.

SOOTY MOLD. **Fumago vagans**, CA, OR, WA.

VIRUS. **Hop Mosaic**, NY, OR, WA; **Hop Latent**; **Hop American Latent**, WA.

WILT. **Verticillium albo-atrum**, ME, OH, OR, WI.

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### Hop-Hornbeam, Ironwood (*Ostrya*)

CANKER. **Nectria** sp., NY; **Strumella coryneoidea**, MD, PA, WV.

CANKER, Bark Patch. **Aleurodiscus** spp.; Felt Fungus, **Septobasidium** spp.

LEAF BLISTER. *Taphrina virginica*, NH to FL, TX, WI.

LEAF SPOT. *Cylindrosporium dearnessi*, VA; *Gloeosporium robergei*, PA, WI; *Septoria ostryae*, IA, NY, WI.

POWDERY MILDEW. *Microsphaera alni*, widespread; *Phyllactinia corylea*, NY to FL, TX, WI; *Uncinula macrospora*, MI, WI.

ROT, Root. *Armillaria mellea*, cosmopolitan; *Clitocybe tabescens*, FL; *Phymatotrichum omnivorum*, TX.

ROT, Wood. *Daedalea confragosa*, cosmopolitan; *Fomes* spp.; *Pleurotus similis*, NY; *Poria* spp.; *Polyporus* spp.; *Stereum* spp.; *Trametes mollis*, NY, VT.

RUST. *Melamporidium carpini* (II, III), NY; 0, I, unknown.

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### Hop-Tree (*Ptelea*)

LEAF SPOT. *Cercospora affiata*, IN, MO, TX; *C. pteleae*, TX; *Phloeospora pteleae*, TX; *Phyllosticta pteleicola*, IL; *Septoria pteleae*, WI.

ROT, Root. *Phymatotrichum omnivorum*, TX.

RUST. *Puccinia windsoriae* (0, I), NY to AL, KS; II, III on grasses.

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### Hornbeam (*Carpinus*)

BLIGHT, Twig, Dieback. *Gibberella baccata*, AL.

CANKER, Bark Patch. *Aleurodiscus oakesii*, NY.

CANKER, Branch, Trunk. *Nectria galligena*, CT, NY; *Pezicula carpinea*, MA to GA, OK.

CANKER, Felt Fungus. *Septobasidium* spp., VA to FL, LA.

LEAF BLISTER. *Taphrina australis*, AL, CT, KY.

LEAF SPOT. *Clasterosporium cornigerum*, MD, NY, WI; *Cylindrosporium dearnessi*, MI; *Phyllosticta* sp., OK; *Sphaerognomonia carpinea*, GA, NY, PA, WV, WI; *Cercoseptoria caryigena*, WI.

POWDERY MILDEW. *Microsphaera alni*, MA, IN, IA, MI, TX; *Phyllactinia corylea*, AL, IN, OH, TX, WI.

ROT, Root. *Armillaria mellea*, FL; *Phymatotrichum omnivorum*, TX.

ROT, Wood. *Daedalea confragosa*, NC; *Polyporus* spp., general; *Poria* spp., general; *Steccherinum* sp., CT; *Stereum* spp., general; *Daldinia concentrica*, MD; *Schizophyllum commune*, cosmopolitan.

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### Horse-Chestnut, Buckeye (*Aesculus*)

ANTHRACNOSE; Leaf Blight. *Glomerella cingulata*, CT, MD, MO, NJ, NY, TX.

BLIGHT, Twig. *Botryosphaeria ribis* var. *chromogena*, MD, NY, GA.

BLOTCH, Leaf. *Guignardia aesculi* (*Phyllosticta paviae*), general.

CANKER; DIEBACK. *Nectria cinnabarina*, cosmopolitan; *Phytophthora cactorum*, bleeding canker, RI; *Gibberella acuminatum*, CA.

LEAF BLISTER, Yellow. *Taphrina aesculi*, CA, TX.

LEAF SPOT. *Cercospora aesculina* FL, VA; *Macrosporium baccatum*, KS; *Monochaetia desmazierii*, NC; *Micosphaerella maculiformis* var. *hippocastani*, CA; *Septoria glabra*, IN; *S. hippocastani*, PA, VT, (Sudden Oak Death) *Phytophthora ramorum*, CA.

MISTLETOE. *Phoradendron serotinum* (*flavescens*), South, central states; *P. villosum*, CA, OR, TX; *Viscum album*, CA, on *Aesculus californica* (California Buckeye).

NONPARASITIC. *Scorch*; Leaf Scald. Response to drought and heat.

POWDERY MILDEW. *Phyllactinia corylea*, CA, TX; *Uncinula flexuosa*, widespread.

ROT, Root. *Armillaria mellea*, cosmopolitan; *Phymatotrichum omnivorum*, TX.

ROT, Wood. *Collybia velutipes*, RI; *Ganoderma applanatum*, cosmopolitan; *Polyporus* spp.

RUST. *Aecidium aesculi*, IN, KS, MO, NE.

WILT. *Verticillium albo-atrum*, PA.

In a wet season leaves are blotched, turn brown, and drop from the *Guignardia* fungus; in

a dry season leaves look scorched or blotched, turn brown, and drop from drought and heat. The minute black fruiting bodies of the fungus distinguish the parasitic form from the physiogenic disease.

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### Horse-Gentian (*Triosteum*)

LEAF SPOT. *Cladosporium triostei*, IL, IA, MO, NE, WV, WI; *Cylindrosporium triostei*, IL, KS, OK, WI; *Cercospora triostei*, WI.

POWDERY MILDEW. *Phyllactinia corylea*, MI.

RUST. *Aecidium triostei* (0, I), MO.

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### Horse Purslane (*Trianthema*)

LEAF SPOT. *Gibbago trianthemae*, AR.

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### Horse-Radish (*Armoracia*)

BACTERIAL Crown Gall. *Agrobacterium tumefaciens*, NJ, NY.

BACTERIAL Leaf Spot. *Xanthomonas campestris* pv. *armoraciae*, CT, IL, IA, MD, MO, SD, VA; *X. phaseoli*, IL.

BACTERIAL, MLO. ROOT, Brittle, disease, virescence. *Spiroplasma citri*, CA, IL, MD.

BACTERIAL Soft Rot. *Erwinia carotovora*, in stored roots, CT, NY.

CLUB ROOT. *Plasmodiophora brassicae*, IL.

DOWNY MILDEW. *Peronospora parasitica*, AL, IL, NJ, SD, WI.

LEAF SPOT. *Alternaria brassicae*, CT to DE, IL, IA; *A. oleracea*, CT to DE, MO, NE, TX; *Cercospora armoraciae*, general; *Phyllosticta decidua*, TX, WA, WI; *P. orbicula*, NY; *Ramularia armoraciae*, general.

NEMATODE, Root Knot. *Meloidogyne* sp., IL, MS, OK.

POWDERY MILDEW. *Erysiphe polygoni*, CA.

ROT, Blue Mold. *Penicillium hirsutum*, IL, NJ.

ROT, Collar, Root. *Pellicularia filamentosa*, IL, MI, NJ, NY, TX, WA.

ROT, Root. *Phymatotrichum omnivorum*, TX; *Thielaviopsis basicola*, KS, NJ.

ROT, Root Complex. *Fusarium acuminatum*, *Verticillium dahliae* and *Pseudomonas fluorescens*, IL, WI.

VIRUS. **Beet Curly Top**, CA, IL, KS, OR, UT, WA; **Turnip Mosaic**, widespread.

WHITE RUST. *Albugo candida*, probably general.

WILT. *Verticillium albo-atrum*, MI, WA.

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### Horseweed (*Conyza*)

ROT. *Sclerotinia minor*, NC.

VIRUS. **Tomato Spotted Wilt**, GA.

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### Hosta (*Plantain-Lily*)

BACTERIAL, Proliferation. *Rhodococcus fascians*, OR.

LEAF SPOT. *Alternaria* sp., NY; *Phyllosticta* sp., NJ.

NEMATODE, LEAF LESION. *Aphelenchoides fragariae*, IL, NY, SC.

ROT, Crown. *Botrytis cinerea*, AK, NJ; *Sclerotium rolfsii* (*S. delphinii*), CT, MD, MN, NJ, NY.

ROT, Root. *Rhizoctonia solani*, NJ; *Fusarium solani*, *F. oxysporum*, *F. proliferatum* (Root and Crown), SC.

VIRUS. **Hosta Virus X**, IL, IN, IA, MN, HI, Pacific Northwest; **Tobravirus**, **Leaf Necrosis**, IL, MI, MN; **Tomato Spotted Wilt**, FL; **Impatiens Necrotic Spot**, NY; **Arabis Mosaic**, MI, MN, NE; **Tobacco Rattle**, **Canna Yellow Mottle**, **Helloborus Black Death Disease**, **Nemerica Necrosis**, **Diascia Yellow Mottle**, Pacific Northwest.

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### Houstonia (*Bluets*)

DOWNY MILDEW. *Peronospora calotheca*, IL; *P. seymourii*, AL, AR, IL, IA, MS, TX.

LEAF SPOT. *Cercospora houstoniae*, DE;  
*Septoria* sp., TX.

ROT, Root. *Phymatotrichum omnivorum*, TX.

RUST. *Puccinia lateritia*, TX; *Uromyces houstoniatus* (0, I), MA to MS, IL, MO, WI; II, III on blue-eyed grass; *U. peckianus* (0, I), AL, MS, TX; II, III on grasses.

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## Hoya

LEAF SPOT. *Myrothecium roridum*, FL.

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## Huckleberry (*Gaylussacia*)

BLACK MILDEW. *Dimerosporium ellissi*, MS, NJ.  
DODDER. *Cuscuta* sp., PA.

GALL, Leaf. *Exobasidium vaccinii*, ME to VA, AL, FL, WI; *Synchytrium vaccinii*, red lead, NJ.

LEAF SPOT. *Ophiodothella vaccinii*, TX; *Pestalotia vaccinii*, WV; *Phyllosticta* sp., NJ, PA; *Ramularia effusa*, WI; *Rhytisma vaccinii*, tar spot, MA, OK, SC.

NEMATODE, Root Knot. *Meloidogyne* sp., OK.

POWDERY MILDEW. *Microsphaera alni* var. *vaccinii*, widespread.

RUST. *Pucciniastrum myrtilli* (II, III), ME to VA, WI; 0, I on hemlock.

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## Huckleberry (*Vaccinium*)

BLIGHT, Sudden Oak Death. *Phytophthora ramorum*, CA.

VIRUS. **Blueberry Scorch**. British Columbia, Canada.

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## Huisache, Sweet Acacia (*Acacia farnesiana*)

ROT, Root. *Clitocybe tabescens*, FL; *Phymatotrichum omnivorum*, TX.

RUST. *Ravenelia australis*, TX; *R. hieronymi*, witches' broom, TX; *R. siliquae*, NM, TX.

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## Hyacinth (*Hyacinthus*)

BACTERIAL Soft Rot. *Erwinia carotovora*, cosmopolitan.

BACTERIAL Yellow. *Xanthomonas hyacinthi*, occasional in imported bulbs.

BLIGHT, Gray Mold. *Botrytis hyacinthi*, WA; *B. cinerea*, NC, after frost.

NEMATODE, Bulb; Ring Disease. *Ditylenchus dipsaci*, NJ, Pacific states.

NONPARASITIC. **Loose Bud; Stem Break**. Excessive water intake during early shoot growth.

ROT, Black. *Sclerotinia sclerotiorum*, Pacific Northwest; *S. bulborum*, black slime.

ROT, Bulb. *Fusarium* sp., CO, MO, NJ, RI, TX, WA; *Penicillium* spp., blue mold, cosmopolitan.

ROT, Root. *Phytophthora* sp., NJ.

VIRUS. **Ornithogalum Mosaic**, CA, MD, NY, OR, TX, WA; **Hyacinth Mosaic**, OR.

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## Hydrangea

BACTERIAL LEAF SPOT. *Xanthomonas campestris*, GA.

BACTERIAL, MLO. **Hydrangea virescence**.

BACTERIAL Wilt. *Pseudomonas solanacearum*, NY.

BLIGHT, Flower; Gray Mold. *Botrytis cinerea*, cosmopolitan, especially after frost.

BLIGHT, Southern. *Sclerotium rolfsii*, FL.

LEAF SPOT. *Ascochyta hydrangeae*, AK, NJ; *Cercospora arborescentis*, IL, OK; *C. hydrangeae*, MD, VA to AL, FL, TX; *Colletotrichum* sp., MD, NJ; *Phyllosticta hydrangeae*, IN; *Septoria hydrangeae*, CT, MS, OH; *Corynespora cassicola*, FL, GA; *Phoma exigua*; *Myrothecium roridum*, TN.

NEMATODE, Leaf. *Aphelenchoides* sp.

NEMATODE, Lesion. *Pratylenchus pratensis*, TX.

NEMATODE, Root Knot. *Meloidogyne* spp., MS, OK, TX.

NEMATODE, Stem, Bulb. *Ditylenchus dipsaci*.

NONPARASITIC. **Chlorosis**. Iron deficiency, excess lime.

POWDERY MILDEW. *Erysiphe polygoni*, general.

ROT, Root. **Phymatotrichum omnivorum**, TX;  
**Armillaria mellea**, CA.

ROT, Stem. **Rhizoctonia solani**, MD; wound,  
**Polyporus versicolor**, CT, IA, MD.

RUST. **Pucciniastrum hydrangeae** (II, III), PA to  
AR, IL; 0, I on hemlock.

VIRUS. **Hydrangea Ring Spot**; **Tomato Spotted  
Wilt**; **Hydrangea Latent**; **Chlorotic Mottle**,  
MN, NY.

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### Hydrilla (Aquatic)

DYING SHOOTS. **Plectosporium tabacinum**, FL,  
Bioassay indicated that **Botrytis** sp.,  
**Cephalosporium** sp., **Curvularia** sp., **Fusar-  
ium culmorum**, **F. moniliforme**, and  
**Phytophthora** sp. were pathogenic to hydrilla.  
Notes: Hydrilla is a submerged aquatic weed. It  
is an exotic, invasive species that is a threat to  
fresh water sources in the USA.

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### Hydrophyllum (Waterleaf)

DOWNY MILDEW. **Peronospora hydrophylli**, IL,  
IA, MD, NY, WA, WI.

LEAF SPOT. **Ascochyta hydrophylli**, WA;  
**Gloeosporium hydrophylli**, NH; **Ramularia  
hydrophylli**, WA; **Septocylindrium  
hydrophylli**, NY; **Septoria hydrophylli**, NY.

POWDERY MILDEW. **Golovinomyces  
cichoracearum**, occasional; **Erysiphe  
polygoni**, ID, WA; **Sphaerotheca macularis**,  
ND, OH, SD.

ROT, Leaf and Stem. **Ceratobasidium anceps**,  
NY, WI.

RUST. **Puccinia hydrophylli** (III), CA, CO, NY to  
NE, ND, UT; **P. recondita** (0, I), MT, wide-  
spread; II, III on grasses.

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### Hymenopappus

DOWNY MILDEW. **Plasmopara halstedii**, OK.

ROT, Root. **Phymatotrichum omnivorum**, TX.

RUST. **Puccinia grindeliae** (0, III), OK.

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### Hyssop (*Hyssopus*)

NEMATODE, Root Knot. **Meloidogyne** sp., MI.

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### Ice Plant (*Carpobrotus*)

ROT, Root. **Pythium aphanidermatum**, CA;  
**Phytophthora cryptogea**, CA.

WILT. **Verticillium dahliae**, CA; **Phomopsis** sp.,  
CA.

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### Impatiens (Garden Balsam, Sultan)

BACTERIAL BLIGHT LEAF. **Pseudomonas syringae**,  
CA.

BACTERIAL FASCIATION. **Clavibacter fascians**, CA.

BACTERIAL WILT. **Pseudomonas solanacearum**,  
WI.

DAMPING-OFF. **Pythium** sp., WA; **Rhizoctonia  
solani**, FL.

DOWNY MILDEW. **Bremiella sphaerosperma**, IN,  
MN, MS, MT, WI, Manitoba, Quebec,  
Canada; **Plasmopara obducens**, CA, IL,  
MA, NY.

GALL, Leaf. **Synchytrium impatientis**, LA.

LEAF SPOT. **Cercospora fukushiana**, FL, KS;  
**Septoria noli-tangeris**, OH; **Phyllosticta**  
sp., NJ.

NEMATODE, Lesion. **Pratylenchus penetrans**.

NEMATODE, Root Knot. **Meloidogyne** sp.

ROT, Crown. **Pythium ultimum** and **Rhizocto-  
nia solani**.

ROT, Mushroom Root. **Armillaria mellea**, CA.

ROT, Stem. **Sclerotium rolfsii**; **Myrothecium  
roridum**.

VIRUS. **Cucumber Mosaic**, SC; **Impatiens  
Latent**, MN; **Impatiens Necrotic Spot**,  
NC; **Tomato Spotted Wilt**, FL, GA, NC,  
OK; **Turnip Mosaic**, NY; **Tobacco Ringspot**,  
IA, MN.

WILT. **Verticillium albo-atrum**, NY;  
**Verticillium dahliae**, OH.



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### Incense-Cedar (*Libocedrus* [= *Calocedrus decurrens*])

BACTERIAL Crown Gall. *Agrobacterium tumefaciens*, AZ, CA.  
 BLIGHT, Brown Felt. *Herpotrichia nigra*, CA.  
 CANKER, Branch. *Coryneum cardinale*, CA.  
 MISTLETOE. *Phoradendron juniperinum*, CA, NV, OR.  
 NEEDLE CAST. *Lophodermium juniperinum*, CA, OR.  
 ROT, Root. *Phymatotrichum omnivorum*, TX; *Armillaria mellea*, OR.  
 ROT, Wood. *Fomes pini* and *F. pinicola*, CA, OR; *Lenzites saepiaria*, general; *Polyporus* spp.; *Trametes isabellina*, CA.  
 RUST. *Gymnosporangium libocedri*, gall, witches' broom (II, III), CA, NV, OR; 0, I on apple and other *Malaceae*.

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### India-Hawthorn (*Raphiolepis*)

BACTERIAL, Fire Blight. *Erwinia amylovora*, FL, GA, LA.  
 BLIGHT, Southern. *Sclerotium rolfsii*, FL.  
 LEAF SPOT. *Entomosporium maculatum* (*Fabraea maculata*), CA.

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### Indian Cucumber-Root (*Medeola*)

GALL, Stem Hypertrophy. *Medeolaria farlowii*, ME, MA, NJ.  
 LEAF SPOT. *Phyllosticta medeolae*, NY.

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### Indian Grass (*Sorghastrum*)

ANTHRACNOSE. *Colletotrichum caudatum*, NY.  
 LEAF SPOT. *Ascochyta brachypodii*, NY, PA.  
 VIRUS. **Barley Yellow Dwarf**.

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### Indigo (*Indigofera*)

CANKER, STEM. *Diaporthe phaseolorum* var. *caulivora*, LA.  
 ROT, Root. *Phymatotrichum omnivorum*, TX.  
 RUST. *Ravenelia laevis*, TX; *Uromyces indigoferae* (II, III), FL, TX.

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### Indigo-Bush, Lead-Plant (*Amorpha*)

LEAF SPOT. *Cylindrosporium passaloroides*, widespread; *Diplodia amorphae*, TX.  
 POWDERY MILDEW. *Erysiphe polygoni*, IA, MN, WY.  
 ROT, Root. *Phymatotrichum omnivorum*, TX.  
 RUST. *Uropyxis amorphae* (0, I, II, III), general.

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### Inkberry (*Ilex glabra*)

BLACK MILDEW. *Asterina ilicis*, NJ; *Morenoella ilicis*, FL, GA, MS.  
 BLIGHT, Thread. *Pellicularia koleroga*, LA.  
 CANKER, Felt Fungus. *Septobasidium* spp., FL.  
 DODDER. *Cuscuta compacta*, FL.  
 LEAF SPOT. *Cercospora ilicis*, AL, FL, MS, NJ; *Phacidium curtisii* and *P. sphaerodiseum*, tar spot, MA to FL, and TX; *Phytophthora cinnamomi*, (leaf spot, yellowing and wilting), VA.  
 ROT, Wood. *Poria versipora*, AR, LA.

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### Inula (*Elecampane*)

LEAF SPOT. *Ramularia* sp., MI.  
 POWDERY MILDEW. *Golovinomyces cichoracearum*, NJ, NY, WI, probably general.  
 RUST. *Puccinia hieracii*, WI.  
 Inula is very susceptible to powdery mildew, which coats the foliage white in late summer.

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## Iresine (Blood-Leaf)

LEAF SPOT. *Septoria iresines*, OK.

NEMATODE, Root Knot. *Meloidogyne* sp., FL, MD.

ROT, Root. *Helicobasidium purpureum*, TX; *Rhizoctonia solani*, IL.

SMUT, Inflorescence. *Thecaphora iresine*, IN.

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## Iris (Bulbous) (English, Spanish, Dutch)

BLIGHT, Blossom. *Botrytis cinerea*; *Glomerella cingulata*, MD.

BLIGHT, Leaf; Ink Disease of Bulbs. *Mystrosporium adustum*, NC, OR, VA.

BLIGHT, Southern; White Bulb Rot. *Sclerotium rolfsii*, CA, CT, FL, MD, NC, OR, SC, TX.

LEAF SPOT, Blight. *Didymellina macrospora*, CA, NC, TX, WA.

NEMATODE, Bulb. *Ditylenchus dipsaci* (*D. iridis*), FL, NY, NC, OR, SC, VA, WA.

NEMATODE, Root Knot. *Meloidogyne* sp., NC.

NEMATODE, Root Plate. *Aphelenchoides parietinus*, MI, NY, NC, TX, WA.

NONPARASITIC. **Blindness**. Complex physiological causes.

ROT, Basal. *Fusarium oxysporum*, AZ, CA, NY, NC, OR, TX, VA, WA.

ROT, Black. *Sclerotinia bulborum*, bulb rot, Northwest; *Rhizoctonia tuliparum*, occasional; Blue Mold, *Penicillium* spp., general.

ROT, Root, Neck. *Rhizoctonia solani*, NJ, Pacific Northwest.

RUST. *Puccinia iridis* (II, III), CA, IN, LA, NC.

VIRUS. **Iris Mosaic**, general; **Iris Severe Mosaic**.

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## Iris (Rhizomatous) (German, Siberian, Native Species)

BACTERIAL Soft Rot. *Erwinia carotovora*, general.

BLIGHT, Blossom. *Botrytis cinerea*, MA.

BLIGHT, Southern; Crown Rot. *Sclerotium rolfsii* (*S. delphinii*), general.

LEAF SPOT. *Alternaria iridicola*, IL, MT, TX, WA WI; *Didymellina macrospora* (*Heterosporium iridis*); *Ascochyta iridis* MD, NY; *Cladosporium herbarum*, secondary; *Kabatiella microsticta*, secondary; *Phyllosticta iridis*, FL, MI, NY, OH, TX, WI; *Stictopatella iridis*, IL.

NEMATODE, Root Knot. *Meloidogyne incognita*.

NONPARASITIC. **Scorch**. Cause unknown, sometimes associated with nematodes.

ROT, Gray Mold; Crown. *Botryotinia convoluta*, MN, NJ, NY, WI.

ROT, Root; Damping-Off. *Rhizoctonia solani*, occasional.

RUST. *Puccinia iridis* (II, III), widespread on native species; most garden varieties are resistant. *P. sessilis* (0, I), ME to NE, MN; II, III on *Phalaris*.

VIRUS. **Iris Severe Mosaic**; **Iris Fulva Mosaic**, MA.

The most common disease of bearded iris in home gardens is bacterial soft rot following iris borer. Crown rot or southern blight gets started when iris is too crowded. *Didymellina* leaf spot or blight may be conspicuous in a wet summer. The physiological () disease, scorch, is causing concern, particularly in central states.

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## Ironweed (*Vernonia*)

BLACK MILDEW. *Stigmella vernoniae*, MO.

DOWNY MILDEW. *Plasmopara halstedii*, KS, MO.

LEAF SPOT. *Cercospora noveboracensis*, MO; *Ascochyta treleasei*, WI; *Mycosphaerella* sp.; *Septoria* sp., MO; *C. oculata*, WV to AL, NE, TX, WI.

POWDERY MILDEW. *Golovinomyces cichoracearum*, general; *Sphaerotheca macularis*, MO.

ROT, Root. *Phymatotrichum omnivorum*, TX.

RUST. *Coleosporium vernoniae* (I, III), general; 0, I on pine; *Puccinia vernoniae* (0, I, II, III), widespread.

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**Italian Dandelion (*Cichorium intybus*)**

BACTERIAL, Leaf Spot. *Pseudomonas syringae*.

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**Itchgrass (*Rottobellia*)**

BLIGHT. *Curvularia cymbopogonis*, LA.  
 ROT, Root. *Pythium arrhenomanes*, LA.

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**Ivesia**

RUST. *Phragmidium horkeliae* (III), UT;  
*P. ivesia*, CA; *P. jonesii*, NV, OR, UT.

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**Ivy, Boston (*Parthenocissus tricuspidata*)**

CANKER; DIEBACK. *Cladosporium herbarum*, IN, NJ, OH, PA.

DOWNY MILDEW. *Plasmopara viticola*, NJ, TX.

LEAF SPOT. *Cercospora amelopsidis*, MS;  
*C. pustulata*, TX; *Guignardia bidwellii*  
 f. sp. *parthenocissi* widespread; *Phloeospora*  
*ampelopsidis*, IA; *Sphaeropsis hedericola*,  
 NJ.

NEMATODE, Dagger. *Xiphinema index*, CA.

POWDERY MILDEW. *Uncinula necator*, TX.

ROT, Root. *Phymatotrichum omnivorum*, TX.

ROT, Stem. *Pellicularia filamentosa*, CT.

The *Guignardia* leaf spot is common and disfiguring.

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**Ivy, English (*Hedera helix*)**

ANTHRACNOSE. *Amerosporium (Colletotrichum)*  
*trichellum*, MA to SC, OK, OR, TX, WA.

BACTERIAL SPOT. *Xanthomonas hederiae*, GA,  
 IL, MD, NJ, NY, VA, WA.

DODDER. *Cuscuta* sp., AZ, NJ.

LEAF SPOT. *Glomerella cingulata*, CT, MD, NY,  
 TX; *Phyllosticta concentrica*, MA to AL,  
 CA, NE, TX, WA; *Ramularia hedericola*,

TX; *Sphaeropsis hedericola*, NY, WV;  
*Macrophoma* sp., TX.

MOLD, Leaf. *Cladosporium brunneolum*, CA.  
 NONPARASITIC. Winter Injury. Sunburn,  
 Freezing.

POWDERY MILDEW. *Golovinomyces*  
*cichoracearum*, OK; *Oidium araliacearum*,  
 CA.

ROT, Root. *Phytophthora palmivora*, CA; *Rhizo-*  
*zoctonia solani*, CT; *Phymatotrichum*  
*omnivorum*, TX.

SOOTY MOLD. Common under trees, on insect  
 exudate.

SPOT ANTHRACNOSE; Ivy Scab. *Sphaceloma*  
*hederiae*, CA, NC, VA.

Leaf spots are not often important in the garden but browning of foliage from winter injury is conspicuous in early spring. English ivy used as a ground cover is often black, with sooty mold growing in honeydew dropped from aphids in trees overhead. Dodder sometimes gets a strangle hold and is difficult to eradicate.

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**Ixia**

ROT, Corm. *Fusarium oxysporum* f. sp. *gladioli*;  
*Sclerotium* sp.

VIRUS. *Iris Mosaic*, OR, WA.

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**Ixora**

NEMATODE, Burrowing. *Radopholus similis*, FL.

NEMATODE, Root Knot. *Meloidogyne* sp., FL.

ROT, Root. *Clitocybe tabescens*, FL.

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**Jacaranda**

ROT, Root. *Armillaria mellea*, CA; *Clitocybe*  
*tabescens*, FL; *Phymatotrichum*  
*omnivorum*, TX.

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### Jack-Bean, Sword Bean (*Canavalia*)

LEAF SPOT. *Cercospora ternateae*, AL.

NEMATODE, Root Knot. *Meloidogyne* spp., FL.

Usually resistant.

POD SPOT. *Vermicularia capsici*, FL;

*V. polytricha*, AL.

VIRUS. Potato Virus X, WI.

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### Jack-in-the-Pulpit (*Arisaema*)

BLIGHT, Leaf and Stalk. *Streptotinia arisaemae* (*Botrytis streptothrix*), IL, IA, MD, NY, PA, WI.

LEAF SPOT. *Cladosporium* sp., mold, VA; *Volutella* sp., IN.

RUST. *Uromyces ari-triphylli* (0, I, II, III), NY to FL and TX; Pacific Northwest.

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### Jacobinia

NEMATODE, Burrowing. *Radopholus similis*, FL.

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### Jacquemontia (Small Flower Morning Glory)

CANKER, STEM. *Diaporthe phaseolorum* var. *caulivora*, LA.

LEAF SPOT. *Cercospora alabamensis*, MS.

NEMATODE, Reniform. *Rotylenchulus reniformis*, GA, LA.

NEMATODE, Root Knot. *Meloidogyne* sp., AL; *Meloidogyne incognita*, LA.

ROT, Root. *Streptomyces ipomoea*, LA; *Ceratocystis fimbriata*, LA; *Fusarium oxysporum* f. sp. *batatas*, LA; *Plenodomus destruens*, LA; *Monilochaetes infuscans*, LA.

RUST. *Coleosporium ipomoeae* (II, III), LA.

VIRUS. Tomato Spotted Wilt, GA, TX.

WHITE RUST. *Albugo ipomoeae-panduratae*, AL.

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### Jacquinia

BLACK SPOT. *Asterella paupercula*, FL.

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### Jamesia (Cliffbrush)

BLIGHT. *Ovularia edwiniae*, CO.

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### Jasmine (*Jasminum*)

BACTERIAL Crown Gall. *Agrobacterium tumefaciens*, MD.

BLIGHT, Blossom. *Choanephora infundibulifera*, FL.

BLIGHT, Southern. *Sclerotium rolfsii*, FL.

CANKER, Stem Gall. *Phomopsis* sp., FL; *Phoma* sp., TX.

LEAF SPOT. *Colletotrichum gloeosporioides*, FL, TX.

LEAF SPOT, Algal; Green Scurf. *Cephaleuros virescens*, FL.

NEMATODE, Root Knot. *Meloidogyne* sp., FL.

ROT, Root. *Clitocybe tabescens*, FL; *Corticium galactinum*, MD.

SPOT ANTHRACNOSE. *Elsinoë jasminae*, FL.

VIRUS. Tobacco Ring Spot, MD; Variegation; Infectious Chlorosis.

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### Jatropha

BLACK MILDEW. *Meliola jatrophae*.

LEAF SPOT. *Colletotrichum gloeosporioides*, FL.

NECROTIC SPOT, BROWN. *Cercospora jatrophae-curcas*, Brazil.

ROT, Root. *Clitocybe tabescens*, FL; *Phymatotrichum omnivorum*, TX.

RUST. *Phakopsora jatrophicola* (II, III), TX; *P. arthuriana*, Brazil.

**Jerusalem-Cherry (*Solanum pseudocapsicum*) (Also *Solanum capsicastrum*, False Jerusalem-cherry; *S. dulcamara*, Bittersweet; *S. integrifolium*, Scarlet Eggplant; *S. nigrum*, Black nightshade)**

BACTERIAL Canker. *Clavibacter michiganense*, WY. Also on *S. dulcamara* (Bittersweet).  
 BACTERIAL Crown Gall. *Agrobacterium tumefaciens*, CT.  
 BLIGHT, Late. *Phytophthora infestans*, MD, NY.  
 CANKER, STEM. *Diaporthe phaseolorum* var. *caulivora*, LA.  
 DODDER. *Cuscuta gronovii*, NY.  
 LEAF SPOT. *Alternaria solani*; *Mycosphaerella solani*, OH; *Ascochyta lycopersici*, NY, OH; *Cercospora dulcamerae*, MI, NY, WI; *Phyllosticta pseudocapsici*, LA; *Stemphylium solani*, FL.  
 NEMATODE, Root Knot. *Meloidogyne* spp., CA, MD, OR.  
 NEMATODE, Tobacco Cyst. *Heterodera tabacum*, VA.  
 PARASITIC Lichen. *Strigula elegans* and *S. complanata*, southern U.S., LA.  
 VIRUS. **Beet Curly Top** on False Jerusalem-cherry (*S. capsicastrum*); **Tobacco Mosaic**, IA, VA; **Tomato Spotted Wilt**, tip blight, OR.  
 WILT. *Verticillium albo-atrum*, NY.

**Jetbead (*Rhodotypos*)**

ANTHRACNOSE. *Gloeosporium* sp., IL.  
 BLIGHT, Twig; Coral Spot. *Nectria cinnabarina*, MA.  
 LEAF SPOT. *Ascochyta rhodotypi*, IL.

**Jipijapa (*Carludovia palmata*)**

PHYTOPLASMA. **Leaf Yellows**, southern Mexico.

**Jobs-Tears (*Coix lachryma-jobi*)**

SMUT, Head. *Ustilago coicis*. Intercepted on imported seed.  
 VIRUS. Chlorotic Streak.

**Johnsongrass (*Sorghum*)**

ANTHRACNOSE. *Colletotrichum sublineolum*, AR.  
 BACTERIAL Leaf Blight. *Acidovorax avenae* (syn. *Pseudomonas avenae*), IL.  
 BLIGHT, Leaf. *Pantoea agglomerans*, Mexico.  
 DOWNY MILDEW. *Peronosclerospora sorghi*, TX.  
 ERGOT. *Claviceps africana*, TX; *Sphacelia* sp., MS.  
 LEAF SPOT, Oval. *Ramulispora sorghicola*, TX.  
 ROT, Root. *Pythium arrhenomanes*, LA; *P. ultimum*, MS.  
 VIRUS. **Johnsongrass Mosaic**; **Sorghum Stunt Mosaic**, CA; **Sorghum Chlorotic Spot**, KS; **Maize Dwarf Mosaic**, IL.  
 WILT, Vascular. *Pantoea agglomerans*, Mexico.

**Jointweed (*Polygonello articulata*)**

RUST. *Puccinia polygoni-amphibii* (II, III), FL, WI.

**Jojoba (*Simmondsia*)**

BLIGHT, Leaf. *Phytophthora parasitica*, AZ.

**Jujube (*Zizyphus*)**

LEAF SPOT. *Cercospora jujubae*, FL.  
 RUST. *Phakopsora zizyphi-vulgaris*, FL.

## Juniper, Red-Cedar (*Juniperus*)

BACTERIAL Crown Gall. *Agrobacterium tumefaciens*, FL, MS.

BLACK MILDEW. *Apiosporium pinophilum*, OR; *Dimerium juniperi*, CA; *Asterina cupressina*.

BLIGHT, Brown Felt. *Herpotrichia nigra*, northern Rockies to Pacific Northwest.

BLIGHT, Leaf. *Chloroscypha juniperina*, IA; *Pestalotia funerea*, secondary; *Cercospora sequoiae* var. *juniperi*, CT, IA, KY, MO, NE, OK, WI; *Exosporium glomerulosum*, NC, SC; *Stigmata juniperina*.

BLIGHT, Nursery, *Phomopsis juniperovora*, MA to FL, KS, MN.

BLIGHT, Tip Dieback. *Sclerophoma pythiophila*, WI.

BLIGHT, Twig. *Phomopsis juniperovora*, VA.

CANKER. *Botryosphaeria stevensii*, IA; *Coryneum cardinale*, CA; *Caliciopsis nigra*, gall, NY.

CANKER, Bark Patch. *Aleurodiscus nivosus*, AL, OR, TX.

DIEBACK, BRANCH. *Diplodia mutila*, PA.

MISTLETOE. *Phoradendron densum* and *P. juniperinum*, widespread.

NEEDLE CAST; Leaf Spot. *Lophodermium juniperinum*, widespread, secondary; *Cylindrocarpon* sp., OR; *Kriegeria* sp., OR.

NEMATODE, Lesion. *Pratylenchus vulnus*, NC.

PARASITE, "False Foxglove". *Aureolaria grandiflora* var. *serrata*, TX.

PHYTOPLASMA, Witches' Broom, OR.

ROT, Heart. *Fomes juniperinus*, PA to KY, TN;

*F. earlei*, Southwest; *F. subroseus*, general;

*F. texanus*, AZ, NM, TX.

ROT, Root. *Armillariella mellea*, CA.

ROT, Root. *Clitocybe tabescens*, FL;

*Phymatotrichum omnivorum*, OK, TX;

*Phytophthora cactorum*; *P. citrophthora*,

CA; *P. dreschleri*, NC; *P. lateralis*, NC;

*P. syringae*, NC.

ROT, Root. *Fomes annosus*, VA.

ROT, Root and Crown. *Phytophthora cinnamomi*, CA; *P. cryptogea*, CA.

ROT, Wood. *Lenzites saepiaria*, occasional;

*Coniophora corrugis*, Pacific Northwest;

*Daedalea juniperina*, SC to AR.

RUST. *Gymnosporangium bermudianum* (III), gall on stems, Gulf states; *G. bethelii* (III), on stems, ND to OK, NM, WA; 0, I on hawthorn; *G. clavariiforme* (III), gall on stems, ME to AL west to MT; 0, I on *Amelanchier*, chokeberry, quince, pear; *G. clavipes* (III), quince rust, on stems, ME to IL, MT; 0, I on *Amelanchier*, hawthorn, quince, apple; *G. corniculans* (III), gall on stems, ME, MI, NY, WI; 0, I on *Amelanchier*; *G. cornutum* (III), gall on stems, leaves, CO, ME, MI; 0, I on mountain-ash; *G. davisii* (III), leaf gall, ME, WI; 0, I on chokeberry; *G. effusum* (III), gall on stems, NY to SC; 0, I on chokeberry; *G. exiguum* (III), on leaves, CA, OK, TX; 0, I on hawthorn; *G. exterum* (III), gall on stems, KY; 0, I, *Gillenia*; *G. floriforme* (III) gall, on leaves, stems, SC to FL, OK, TX; 0, I on hawthorn; *G. globosum*, hawthorn rust (III); 0, I on hawthorn, apple, pear, mountain-ash; *G. harknessianum* (III), on western juniper; 0, I on *Amelanchier*; *G. inconspicuum* (III), CA, CO, UT; 0, I on *Amelanchier*; *G. gracile*, Witches' Broom (III), 0, I, on sand pear; *G. clavipes*, galls on stems, VA; *G. globosum*, gall on stems, VA; *G. exterum*, gall on stems, VA; *G. juvenescens* (III), gall on stems, Witches' Broom, MN, NE, WI; 0, I on *Amelanchier*; *G. japonicum* (III), CT, MA, NJ, WA; 0, I on *Photinia*; *G. kernianum*, Witches' Broom, ID, OR to AZ, NM; 0, I on *Amelanchier*, pear; *G. multiporum* (III), CO to CA, NM; 0, I unknown; *G. nelsonii* (III), gall on stems, MT, SD; 0, I on hawthorn, crabapple, mountain-ash, quince, *Amelanchier*; *G. nidusavis* (III), gall on stems; Witches' Broom, East and South; 0, I on *Amelanchier*, apple, hawthorn, mountain-ash, quince; *G. speciosum* (III), on stems, AZ, CO, NV, NM; 0, I on *Fendlera*, *Philadelphus*; *G. trachysorum* (III), on stems, FL, LA, MS, SC; *G. tremelloides* (III) gall on stems, CO to Pacific Northwest; 0, I on mountain-ash; *G. tubulatum* (III), gall on stems, SD to OR, WA; 0, I on hawthorn; *G. vauqueliniae* (III), on one-seed juniper; 0, I on *Vauquelinia*, causing Witches' Broom.

RUST, Cedar-Apple. *Gymnosporangium juniperi-virginianae* (III), gall on leaves of

red-cedar, prostrate and Rocky Mountain junipers, general; 0, I on apple, crabapple.

Of this lengthy list of juniper rusts the three common apple rusts are most important in the garden, not so much for the damage to this host as for the harm to the deciduous fruit or ornamental. These three are the cedar-apple rust caused by *Gymnosporangium juniperi-virginianae*, the hawthorn rust by *G. globosum*, and the quince rust by *G. clavipes*. The latter is perennial in juniper and may produce spores each spring for as long as 20 years. Varieties of *Juniperus chinensis* and *J. communis* and some other forms are resistant to cedar-apple and cedar-hawthorn rusts. If you have only a few red-cedars, it is quite feasible to cut out galls in late winter, before spores are produced.

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## Kageneckia

SCAB. *Spilocaea botryae*, CA.

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## Kalanchoe

BACTERIAL Crown Gall. *Agrobacterium tumefaciens*.

BACTERIAL Wilt and Soft Rot. *Erwinia carotovora* pv. *carotovora*, FL.

BLIGHT, Flower. *Stemphylium bolickii*, FL; *S. floridanum* f. sp. *kalanchoe*, also leaf spot, FL.

LEAF SPOT. *Cercospora* sp., MS.

ROT, Crown, Stem; Wilt. *Phytophthora cactorum*, NJ, NY; *Diplodia natalensis*, AL.

VIRUS. Mosaic, FL; **Kalanchoe Latent; Kalanchoe Top-Spotting.**

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## Kentucky Coffee-Tree (*Gymnocladus*)

LEAF SPOT. *Cercospora gymnocladi*, North central states; *Marssonin* sp., Northeast; *Phyllosticta gymnocladi*, IL.

ROT, Root. *Phymatotrichum omnivorum*, OK, TX.

ROT, Wood. *Polyporus pulchellus*, IN, MI.

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## Kerria

BLIGHT, Twig. *Phomopsis japonica*, NJ, OH, TX.

CANKER, Coral Spot. *Nectria cinnabarina*, NJ, OR, WA.

LEAF SPOT; Leaf and Twig Blight. *Coccomyces kerriae*, widespread, eastern states to IA and TX; *Septoria* sp., MD, NJ.

ROT, Root. *Phymatotrichum omnivorum*, TX.

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## Kidney Vetch, Lady's Fingers (*Anthyllis*)

BLIGHT, Leaf and Stem. *Fusarium* sp., NC.

LEAF SPOT. *Phyllosticta* sp., NC.

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## Kiwi (*Actinidia*)

BACTERIAL Canker. *Pseudomonas syringae*, CA.

NEMATODE, Root Knot. *Meloidogyne incognita*, SC.

ROT, Root and Wilt. *Cylindrocladium crotalariae*, SC; *Pythium ultimum*, AL.

WILT. *Verticillium albo-atrum*, Chile.

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## Kniphofia (Tritoma, Torch-Lily, Poker-Plant)

LEAF SPOT. *Alternaria* sp., AL.

NEMATODE, Root Knot. *Meloidogyne* sp., CA.

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## Knotroot Bristlegrass (*Setaria geniculata*)

BLIGHT. *Beniowskia sphaeroidea*, GA.

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## Kochia (Summer-Cypress)

DAMPING-OFF; Root Rot. *Pythium debaryanum*; SD; *Rhizoctonia solani*, TX.

ROT, Root. **Phymatotrichum omnivorum**, TX.  
 RUST. **Puccinia aristidae** (0, I), CO, NE, TX.  
 VIRUS. **Beet Curly Top**, CA.

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### Kohleria

VIRUS. **Tobacco Mosaic**, CA, CT, DC, FL, OH, WA.

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### Krigia (Dwarf Dandelion)

DOWNY MILDEW. **Bremia lactucae**, MS, MO, OKWI.  
 LEAF SPOT. **Mycosphaerella krigiae**, IL, WI;  
**Septoria krigiae**, KY, NY, WI.  
 ROT, Root. **Phymatotrichum omnivorum**, TX.  
 RUST. **Puccinia dioicae** (0, I), IL, IA, WI; II, III  
 on *Carex*; **P. hieracii** (0, I, II, III), NC;  
**P. maculosa** (III), IL, MI, MS, MO, PA, TN.

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### Kudzu (*Pueraria*)

BACTERIAL Blight. **Pseudomonas phaseolicola**,  
 CT to FL, LA, IN; **P. syringae**, NY.  
 BLIGHT, Web. **Pellicularia filamentosa**, GA, MS.  
 DAMPING-OFF. **Rhizoctonia solani**.  
 LEAF SPOT. **Alternaria** sp., secondary;  
**Mycosphaerella pueraricola**, MS, AL, GA.  
 NEMATODE, Root Knot. **Meloidogyne** spp.,  
 general.  
 ROT, Charcoal. **Macrophomina phaseoli**, GA;  
 stem, **Fusarium** sp., LA.  
 ROT, Root. **Phymatotrichum omnivorum**, TX.  
 RUST. **Phakopsora pachyrhizi**, FL, IL, KY, NC,  
 TX.  
 VIRUS. **Bean Common, Mottling and Ringspot**,  
 MS.

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### Kuhnia (False-Boneset)

LEAF SPOT. **Pleospora compositarum**, NM, TX.  
 ROT, Root. **Phymatotrichum omnivorum**, TX.  
 RUST. **Puccinia kuhniae** (0, I, II, III), IN to AL,  
 FL, MT, NE, ND, TX.

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### Kumquat (*Fortunella*)

DODDER. **Cuscuta campestris**, FL.  
 LEAF SPOT. **Cephaluros virescens**, algal spot,  
 Gulf states; **Phyllosticta citricola**, MS.  
 NEMATODE, Citrus. **Tylenchulus semipenetrans**,  
 FL.  
 ROT, Black. **Alternaria citri**; stem-end,  
**Diaporthe citri**, CA.

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### Lamium (Perennial Groundcover)

NEMATODE, Leaf. **Aphelenchoides fragariae**,  
 CT.

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### Lantana

BLACK MILDEW. **Meliola cookeana**, FL.  
 LEAF SPOT. **Alternaria** sp., TX.  
 NEMATODE, Leaf. **Aphelenchoides fragariae**,  
 NJ.  
 NEMATODE, Root Knot. **Meloidogyne** spp.,  
 widespread.  
 ROT, Root. **Phymatotrichum omnivorum**, TX.  
 RUST. **Puccinia lantanae** (III), FL.  
 VIRUS. **Tomato Spotted Wilt**, PA.  
 WILT. **Fusarium** sp., NJ.

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### Lappula (*Hackelia*)

DOWNY MILDEW. **Peronospora echinospermi**,  
 IA, TX; **P. myosotidis**, MT.  
 LEAF SPOT. **Cercospora cynoglossi**, WI;  
**Ovularia asperifolii** var. **lappulae**, WI;  
**Phyllosticta decidua**, WI, TX.  
 POWDERY MILDEW. **Golovinomyces**  
**cichoracearum**, IA, MI, MN, MO, OH, TX,  
 WI; **Microsphaera** sp., IL.  
 ROT, Root. **Phymatotrichum omnivorum**, TX.  
 RUST. **Puccinia mertensiae** (III), TX, UT.  
 SMUT, Leaf. **Entyloma serotinum**, UT.



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**Larch (*Larix*)**

BLIGHT, Needle. **Hypodermella laricis**, Great Lakes, Pacific Northwest. **Meria laricis**, ID.

BLIGHT, Seedling. **Thelephora caryophyllea**, ID, MT, girdle, smother; **Rhizina undulata**, ID; **Meria laricis**, WA.

CANKER. **Aleurodiscus amorphus**, bark patch, Northwest; **A. spinulosus**; **A. werii**; **Lachnellula willkommii**, European larch canker, MA, eradicated, ME; **Valsa kunzei** var. **kunzei**.

CANKER. **Phomopsis pseudotsugae** (*Phacidiella coniferarum*) on western larch, Northwest.

DAMPING-OFF. **Rhizoctonia solani**, cosmopolitan.

MISTLETOE, Dwarf. **Arceuthobium campylopodum**, MT to OR, WA; **A. pusillum**, Northeast, MN.

NEEDLE CAST. **Lophodermium** sp., WA; **L. laricinum**, MT to OR; **L. laricis**, ID; **Cladosporium** sp., ME; **Mycosphaerella laricina**, IA, VT, WI.

ROT, Heart. **Echinodontium tinctorium**, WA; **Fomes** spp., widespread.

ROT, Root. **Armillaria mellea**, cosmopolitan; **Phymatotrichum omnivorum**, TX.

ROT, Sapwood. **Lenzites saepiaria**.

ROT, Seedling. **Botrytis douglasii**, gray mold, Northwest; **Cylindrocladium scoparium**, NJ; **Phytophthora cinnamomi**, MD; **Sparassis radicata**, MT to OR, WA.

ROT, Wood. **Polyporus** spp.; **Poria** spp.; **Stereum** spp., widespread.

RUST. **Melampsora paradoxa** (0, I), northern U. S. including AK; II, III on willow; **M. laricipopulina** (0, I), Quebec, Canada, WA; II, III on poplar; **M. medusae** (0, I), New England to MI and IN; II, III on poplar; **M. medusae** f. sp. **deltoidea** (0, I), WA; II, III on poplar; **Melampsoridium betulinum** (0, I), CT, WI; II, III on birch.

WOOD DECAY fungi associated with woodpecker nest cavities: **Coniophora puteana**, **Gloeophyllum sepiarium**, **Oligoporus placentus**, **Stereum sanguinolentum**, **Neolentinus lepideus**, **Phaelous schweinitzii**, **Wolfiporia cocos**, OR.

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**Larkspur**

► Delphinium.

Crown Rot, Southern Blight, is prevalent on annual larkspur.

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**Laurel**

► California-Laurel,

► Cherry-Laurel,

► Mountain-Laurel.

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**Laurel, Sweet Bay (*Laurus*)**

BLIGHT, Ramorum. **Phytophthora ramorum**, PA.

BLIGHT, Thread. **Pellicularia koleroga**, SC.

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**Laurestinus (*Viburnum tinus*)**

DOWNY MILDEW. **Plasmopara viburni**, GA.

LEAF SPOT. **Hendersonia tini**, LA; **Leptosphaeria tini**, LA.

LEAF SPOT, Algal. **Cephaleuros virescens**, FL, LA.

NEMATODE, Root Knot. **Meloidogyne** sp., CA.

POWDERY MILDEW. **Erysiphe viburni**, CA.

VIRUS. **Alfalfa Mosaic**, Chile.

WILT. **Verticillium albo-atrum**, OR.

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**Lavatera (Treemallow)**

ANTHRACNOSE, Leaf Spot. **Colletotrichum malvarum**, CA, TX.

DAMPING-OFF. **Rhizoctonia solani**, IL.

ROT, Root. **Phymatotrichum omnivorum**, TX.

RUST. **Puccinia malvacearum** (III), CA.

VIRUS. **Abutilon Infectious Variegation**.

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**Lavender (*Lavandula*)**

BACTERIAL LEAF DISEASE. **Xanthomonas campestris**, CA.

LEAF SPOT. *Septoria lavandulae*, OH, OK.  
NEMATODE, Root Knot. *Meloidogyne* sp.  
ROT, Root. *Armillaria mellea*, TX.

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## Lawns

► Grasses.

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## Layia (Tidy-Tips)

POWDERY MILDEW. *Golovinomyces*  
*chioracearum*, CA.  
VIRUS. Tomato Spotted Wilt, CA.

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## Leadtree (*Leucaena*)

ROT, Root. *Ganoderma sulcatum*, TX.  
RUST. *Ravenelia leucaenae* (II, III), TX.

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## Leatherwood (*Dirca*)

RUST. *Puccinia dioicae* (I), ME to MN, MO, AL;  
II, III on *Carex*.

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## Lebbek (*Albizia lebbek*)

LEAF SPOT, Algal. *Cephaleuros virescens*, FL.  
RUST. *Sphaerophragmium acaciae*, FL.

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## Ledum (Labrador-Tea)

GALL, Leaf. *Exobasidium vaccinii*, AK,  
OR, WA; *Synchytrium vaccinii*, red spot,  
ME.

LEAF SPOT. *Ascochyta ledi*, WI; *Cryptostictis*  
*arbuti*, CA, OR; *Rhytisma andromedae*, tar  
spot, ID.

POWDERY MILDEW. *Microsphaeraalni*, WA.

RUST. *Chrysomyxa ledi* (II, III), CA, CT, ID, MI,  
MT, NV, NH, NY, WI, WY; *C. ledicola* (II,  
III), AK, ME, NH, NY, WA, WI; 0, I on  
spruce.

SPOT ANTHRACNOSE. *Elsinoë ledi*, CA, ME, MI,  
MN, NY, OR, PA, WA, WI.

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## Leek

► Shallot.

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## Lemon

► Citrus Fruits.

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## Lemon Grass, Citronella Grass (*Cymbopogon*)

LEAF SPOT, Eye-spot. *Helminthosporium*  
*sacchari*, FL.  
RUST. *Puccinia nakanishikii*, CA.  
TANGLE-TOP. *Myriogenospora paspali*, FL.

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## Lentil (*Lens*)

ANTHRACNOSE. *Colletotrichum truncatum*,  
ND.

BACTERIAL, Pink Seed. *Erwinia rhapontici*, Sas-  
katchewan, Canada.

NEMATODE, Lesion. *Pratylenchus neglectus*,  
*P. thornei*, ID.

POWDERY MILDEW. *Erysiphe trifolii*, WA.

ROT, Root. *Thielaviopsis basicola*, ID, WA;  
*Pythium irregulare*, WA; *Aphanomyces*  
*euteiches*, ID.

VIRUS. Red Clover Vein Mosaic, OR; Virus  
epidemic, WA.

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## Leptospermum

ROT, Root. *Armillaria mellea*, CA.

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## Lespedeza

LEAF AND STEM DISEASE. *Cercospora zebrina*  
(clover isolate), NC.

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## Lettuce (*Lactuca*)

ANTHRACNOSE. **Marssonina panattoniana**, NY to FL, CA, MI, OR, TX, WA.

BACTERIAL Leaf Spot. **Xanthomonas campestris** pv. **vitians**, OH.

BACTERIAL Marginal Leaf Blight. **Pseudomonas fluorescens** pv. **marginalis**, KS, MO, NJ, NY; **P. cichorii**, NY.

BACTERIAL, MLO. **Aster Yellows** (white heart, Rio Grande Disease) and **California Aster Yellows**, widespread.

BACTERIAL Rot. **Pseudomonas viridilivida**, DE, LA, MI, NH, NY, VA, WA.

BACTERIAL Soft Rot. **Erwinia carotovora**, cosmopolitan in market.

BACTERIAL Wilt. **Xanthomonas vitians**, NJ, NM, NY, PA, SC, VA.

BLIGHT, Southern. **Sclerotium rolfsii**, CA, FL, NC, SC, TX, VA.

CORKY ROOT. **Rhizomonas suberifaciens**, FL.

DAMPING-OFF; Stump Wilt; Stunt. **Pythium** spp., cosmopolitan.

DOWNY MILDEW. **Bremia lactucae**, general.

LEAF SPOT. **Alternaria** sp., secondary; **Cercospora longissima**, FL, IL, IN, TX, VA, WI; **Septoria lactucae**, occasional in East and central states, to CO, FL, MN.

LEAF YELLOWING; STUNT. **Pythium uncinatum**, CA.

NECROSIS OF ROOTS, SYSTEMIC. **Plasmopara lactucaeradicis**, hydroponically grown, VA.

MOLD, Leaf; Seed. **Pleospora herbarum**, FL, KY, NY.

NEMATODE. **Nacobus batatiformis**.

NEMATODE, Lesion. **Pratylenchus** sp.

NEMATODE, Root Knot. **Meloidogyne hapla**.

NEMATODE, Sting. **Belonolaimus gracilis**.

NONPARASITIC. **Tipburn**. High temperature and excessive transpiration.

**Brown Blight**. Cause unknown, AZ, CA.

POWDERY MILDEW. **Golovinomyces cichoracearum**, CA, MI.

ROT, Basal. **Phoma exigua**, CA.

ROT, Black Root. **Thielaviopsis basicola**, CA.

ROT, Bottom; Damping-off. **Rhizoctonia solani**, general.

ROT, Gray Mold. **Botrytis cinerea**, chiefly in greenhouses, sometimes outdoors.

ROT, Root. **Fusarium** sp., KY, OH; **Phymatotrichum omnivorum**, AZ, TX; **Phytophthora cryptogea**, CA; **P. drechsleri**, Mexico; **Pythium myriotylum**, VI.

ROT, Watery Soft; Drop. **Sclerotinia sclerotiorum**, widespread; **S. minor**, in transit and market.

RUST. **Puccinia dioicae** (0, I), IN, MN, ND, WI; II, III on *Carex*; **P. hieracii** (II), CA.

SLIME MOLD. **Physarum cinereum**, occasional under glass.

VIRUS. **Cucumber Mosaic**, NY; **Sonchus Yellow Net**, FL; **Tobacco Rattle**, CA; **Lettuce Mosaic**, general; **Radish Yellows**; **Lettuce Big Vein**, associated with *Olpidium brassicae* in roots, FL; **Tomato Spotted Wilt**, CA, HI, TX; **Tobacco Necrosis**; **Lettuce Infectious Yellows**, AZ, CA; **Lettuce Speckles Mottle**, CA; **Tomato Bushy Stunt**, CA; **Tobacco Streak**, FL; **Potato Leafroll**. Pacific Northwest, **Cucurbit Yellow Stunting Disorder**, CA; **Impatiens Necrotic Spot**, CA.

WHITE RUST. **Albugo** sp., TX.

WILT, Leaf Blight. **Pythium tracheiphilum**, WI; **Fusarium oxysporum** f. sp. **lactucae**, AZ, CA.

Nonparasitic tipburn is the most general of lettuce diseases, prevalent at high temperatures when soil is deficient in moisture. Some hot weather varieties are rather resistant. Spacing plants well apart in a well-drained soil will reduce bottom rot and drop. Eliminate wild weed hosts and spray for leafhopper vectors to reduce aster yellows.

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## Leucojum (Snowflake)

LEAF SCORCH, Red Blotch. **Stagonospora curtisii**, CA.

NEMATODE, Meadow. **Pratylenchus** sp.

ROT; Scale Speck, of Bulbs. **Botrytis** sp., CA.

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## Leucospermum

BLIGHT. **Calonectria colhounii**, HI.

WILT. **Verticillium dahliae**, CA.

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## Leucothoë

BLACK MILDEW. *Asterina diplodioides*, AL.  
 BLIGHT, Leaf Spot. *Cylindrocladium*  
*avesiculatum*, GA; *C. colhounii*, NC.  
 BLIGHT, Ramorum. *Phytophthora ramorum*,  
 PA.  
 CANKER, Felt Fungus. *Septobasidium pseudope-*  
*dicellatum*, FL.  
 GALL, Leaf. *Exobasidium vaccinii*, MA, MS, NC.  
 LEAF SPOT. *Cercospora leucothoës*, NJ, NY;  
*Cryptostictis* sp.; *Guignardia leucothoës*,  
 MD, NC, RI, SC, TN, VA; *Mycosphaerella*  
*leucothoës*, NJ; *Phyllosticta terminalis*, NY  
 to FL; *Ramularia andromedae*, NJ;  
*Rhytisma decolorans*, tar spot, CT, FL, TN,  
 VA. *Pestalotia leucothoës*, NJ.  
 POWDERY MILDEW. *Microsphaera penicillata*,  
 GA.  
 SPOT ANTHRACNOSE. *Elsinoë ledi*, FL.

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## Lewisia (Bitterroot)

RUST. *Uromyces unitus* (I, III), CA, MT, WA.

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## Liatris (Gayfeather)

DODDER. *Cuscuta glomerata*, OK.  
 LEAF SPOT. *Phyllosticta liatridis*, WI; *Septoria*  
*liatridis*, MN, ND, TX, WI.  
 NEMATODE, Root Knot. *Meloidogyne* sp.  
 POWDERY MILDEW. *Golovinomyces*  
*cichoracearum*, OK.  
 ROT, Root. *Phymatotrichum omnivorum*, TX.  
 ROT, Stem. *Sclerotinia sclerotiorum*, NY.  
 RUST. *Coleosporium laciniariae* (II, III), NJ to  
 FL, AR, TX; 0, I on pines; *Puccinia liatridis*  
 (0, I), IN, KS, MT, NE, ND, WI to CO; II, III  
 on grasses.  
 WILT. *Verticillium albo-atrum*, NJ.

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## Ligustrum

►Privet.

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## Lilac (*Syringa*)

ANTHRACNOSE, Shoot Blight. *Gloeosporium*  
*syringae*, CT, MA.  
 BACTERIAL Crown Gall. *Agrobacterium*  
*tumefaciens*, CT.  
 BACTERIAL Blight; Twig Canker. *Pseudomonas*  
*syringae*, northeastern states to AL, IL,  
 Pacific Coast.  
 BLIGHT, Blossom, Shoot. *Phytophthora*  
*cactorum*, IA, MD, MA, MN, NJ; *P. syringae*,  
 MD, NY; *Sclerotinia sclerotiorum*, WA.  
 BLIGHT, Cutting. *Cylindrocladium scoparium*  
 and *C. floridanum*, FL, OH.  
 BLIGHT, Gray Mold. *Botrytis cinerea*. Pacific  
 Northwest, Northeast.  
 BLIGHT, Ramorum. *Phytophthora ramorum*, PA.  
 BLIGHT, Thread. *Pellicularia koleroga*, FL, MS,  
 NC.  
 BACTERIAL, Witches Broom. *MLO*, IL.  
 BLOTCH, Leaf. *Heterosporium syringae*, NJ;  
*Cladosporium herbarum*, secondary,  
 cosmopolitan.  
 CANKER; Stem Girdle. *Hymenochaete*  
*agglutinans*, CT.  
 CANKER; DIEBACK. *Physalospora obtusa*, MA to  
 VA, OH.  
 LEAF SPOT. *Cercospora lilacis*, widespread;  
*Macrophoma halstedii*, CT, NJ, NY;  
*Phyllosticta* sp., MA; *Pleospora herbarum*,  
 secondary, MD.  
 NEMATODE, Citrus. *Tylenchulus semipenetrans*.  
 NONPARASITIC. **Blight**. Graft incompatibility of  
 lilac scion on privet stock.  
 POWDERY MILDEW. *Microsphaera alni*, general.  
 PHYTOPLASMA. **Witches' Broom**, IL; **Ash Yel-**  
**lows**, MD, ND.  
 ROT, Root. *Phymatotrichum omnivorum*, TX;  
*Armillaria mellea*, CA, MS; *Thielaviopsis*  
*basicola*, CT.  
 ROT, Wood. *Polyporus gilvus*, MD; *Stereum*  
*purpureum*, OK.  
 VIRUS. **Lilac Mottle**; **Lilac Ring Spot**, MI, MN;  
**Lilac Witches' Broom**, MD.  
 Powdery mildew is the most general and con-  
 spicuous disease of lilacs, but it comes too late in  
 the season to damage the bushes materially. It can

be controlled with repeated application of GreenCure, sulfur, or Karathane, where the time and expense are justified. In wet seasons bacterial and Phytophthora blights may be important, but dieback is more often due to borers than to diseases.

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## Lily (*Lilium*)

BACTERIAL Soft Rot. *Erwinia carotovora*, GA, MA, NJ, WV.

BLIGHT, Botrytis; Leaf Spot. *Botrytis elliptica*, general; *B. cinerea*, general; *B. liliorum*, CA; *Botryotinia sphaerosperma*, CA.

BLIGHT, Bud. *Sporotrichum* sp., secondary, VA.

BLIGHT, Southern; Bulb Rot. *Sclerotium rolfsii*, cosmopolitan.

CANKER, Stem. *Rhizoctonia solani*, CA.

DAMPING-OFF. *Pythium debaryanum*; *Rhizoctonia solani*, cosmopolitan.

LEAF SPOT. *Cercospora* sp., FL; *Cercospora lili*, CT, NY; *Ramularia* sp., WA; *Heterosporium* sp., MD.

MOLD, Leaf and Bulb. *Cladosporium* sp., cosmopolitan.

NEMATODE, Leaf; Bunchy Top; Dieback. *Aphelenchoides fragariae*, CA, OR, WA and in greenhouses.

NEMATODE, Lesion. *Pratylenchus pratensis*, *P. penetrans*, Northwest; *P. vulnus*, OR.

NEMATODE, Root Knot. *Meloidogyne* spp., FL.

NONPARASITIC, **Scorch**, of Easter lilies. Acid soil, low fertility, excessive phosphorus.

**Bud Blast**. Insufficient light; also causes drop of lower leaves. **Chlorosis**. Iron deficiency. Sometimes result of systemic insecticide. **Limber Neck**. Physiological.

PHYTOPLASMA. Mexico.

ROT, Basal. *Fusarium oxysporum* f. sp. *lili*, general.

ROT, Black Scale. *Colletotrichum lili*, LA, MS; Brown Scale, *Colletotrichum* sp., OR, WA; Scale-tip, *Cylindrocarpon radicola*, secondary.

ROT, Bulb. *Penicillium* spp., blue mold; *Rhizopus* sp., soft rot, cosmopolitan.

ROT, Charcoal. *Macrophomina phaseoli*, CA.

ROT, Root. *Pythium* spp.; *Rhizoctonia solani*, wide spread.

ROT, Stem, Foot. *Phytophthora cactorum*, MD, MN, NJ, NC, NY, OH, WA, WI; *P. parasitica*, top rot, IN, MD, NJ, NY; *Rhizoctonia tuliparum*, WA; *Sclerotinia sclerotiorum*, CT, FL, TX, WA.

RUST. *Puccinia sporoboli* (0, I), NE, ND; II, III on *Sporobolus*; *Uromyces holwayi* (0, I, II, III), ME to NJ, CA, ID, MI, MN, NE, OR, WA.

VIRUS. **Lily Fleck**; **Lily Latent Mosaic**; **Lily Mottle**; **Lily X**, CA; **Lily Ring Spot**; **Lily Rosette**; **Lily Symptomless**, MD, Argentina; **Cucumber Mosaic**; **Tulip Breaking Mosaic**; **Streak**, on Easter lily, virus from wild cucumber; **Curly-Stripe Disease**, OR.

Garden lilies are particularly subject to Botrytis blight and mosaic. Madonna lilies are most susceptible, with leaves often completely blackened in wet weather. Copper sprays are perhaps most effective. The only sure way to be free from mosaic and other virus diseases is to grow lilies from seed in an isolated portion of the garden.

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## Lily-of-the-Valley (*Convallaria*)

BLIGHT, Gray Mold; Rhizome Rot. *Botrytis paeoniae*, IL, ME, PA.

BLIGHT, Southern. *Sclerotium rolfsii*, ME.

LEAF BLOTCH. *Ascochyta majalis* (*Mycosphaerella convallaris*), PA.

LEAF SPOT. *Gloeosporium convallariae*, NY; *Kabatiella microsticta*, secondary, MD; *Phyllosticta* sp., NJ, NY; *Phytophthora citricola* (also foliar blight), CA.

NEMATODE, Meadow. *Pratylenchus pratensis*, associated with forcing failures.

NEMATODE, Root Knot. *Meloidogyne* sp., occasional.

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## Linaria (Blue Toadflax; Butter and Eggs)

ANTHRACNOSE. *Colletotrichum vermicularioides*, MA, NJ, NY, TX, WI.

BACTERIAL, MLO. **Aster Yellows**, CA.  
 BLIGHT, Gray Mold. **Botrytis cinerea**, AK.  
 BLIGHT, Southern. **Sclerotium rolfsii**, TX.  
 DOWNY MILDEW. **Peronospora linariae**, FL, MA,  
 OK, WI.  
 LEAF SPOT. **Alternaria** sp., MI; **Septoria  
 linariae**, WI.  
 NEMATODE, Root Knot. **Meloidogyne** spp.  
 NEMATODE, Stem and Leaf. **Ditylenchus dipsaci**,  
 NY.  
 POWDERY MILDEW. **Golovinomyces  
 cichoracearum**, CA.  
 ROT, Root. **Phymatotrichum omnivorum**, TX;  
**Rhizoctonia solani**, IL; **Thielaviopsis  
 basicola**, CT.  
 ROT, Stem. **Sclerotinia sclerotiorum**, AZ.  
 RUST. **Puccinia antirrhini** (II, III), CA;  
**Aecidium** sp., WI.  
 SMUT, White. **Entyloma linariae**, CT, NJ, PA.

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### Linden, Basswood (*Tilia*)

ANTHRACNOSE; Leaf Spot. **Gnomonia tiliae  
 (Gloeosporium tiliae)**, CT to VA, IA, MN.  
 BLIGHT, Leaf. **Cercospora microsora**, general.  
 CANKER, Bark. **Aleurodiscus acerinus**;  
**A. griseo-canus**, IA, MO, PA.  
 CANKER; DIEBACK. **Botryosphaeria** sp., MD;  
**Nectria** spp., NY, PA, VA; **Strumella** sp., NJ.  
 CANKER, Felt Fungus. **Septobasidium  
 fumigatum**, FL.  
 LEAF SPOT. **Phlyctema tiliae**, NY; **Phyllosticta  
 praetervisa**, WI; **Sphaeropsis** sp., OK.  
 MISTLETOE. **Phoradendron serotinum  
 (flavescens)**, South.  
 POWDERY MILDEW. **Microsphaera alni**, MN;  
**Phyllactinia corylea**, MN; **Uncinula  
 clintonii**, general.  
 ROT, Heart. **Daedalea confragosa**, VT; **Fomes  
 spp.**; **Steccherinum septentrionale**, AL, MI;  
**Pholiota adiposa**, MA, PA, TN.  
 ROT, Root. **Phymatotrichum omnivorum**, TX;  
**Ustulina vulgaris**, NY; **Phytophthora  
 dreschleri**, NC.  
 ROT, Sapwood. **Collybia velutipes**, occasional;  
**Pleurotus ostreatus**, cosmopolitan.

ROT, Wood. **Daldinia concentrica**, MN, NY;  
**Lenzites betulina**, NY, VT; **Schizophyllum  
 commune**, MN; **Polyporus** spp.; **Stereum  
 spp.**; **Trametes mollis**, VT.  
 SOOTY MOLD. **Fumago vagans**.  
 SPOT ANTHRACNOSE. **Elsinoë tiliae**, VA.  
 WILT. **Verticillium albo-atrum**, IL.  
 Anthracnose and Cercospora leaf blight are  
 common diseases.

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### Linnaea (Twin-Flower)

BLACK MILDEW. **Halbaniella linnaeae**, NY.  
 LEAF SPOT. **Phyllachora wittrockii**, tar spot, MI,  
 MT, NM, NY; **Venturia dickei**, ID, MI, MT,  
 NM, NY, OR, WA, WI; **Septoria  
 breviuscula**, NY.

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### Lions-Ear (*Leonotis*)

LEAF SPOT. **Cercospora leonotidis**, LA; **Septoria  
 breviuscula**, NY.  
 RUST. **Puccinia leonotidis** (0, I, II, III), FL.

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### Lippia (Fog-Fruit, Lemon-Verbena)

BACTERIAL Crown Gall. **Agrobacterium  
 tumefaciens**, AZ.  
 BLACK MILDEW. **Meliola lippiae**, AZ, FL.  
 BLIGHT, Southern. **Sclerotium rolfsii**, AZ, CA.  
 LEAF SPOT. **Cercospora lippiae**, widespread;  
**Cylindrosporium lippiae**, TX.  
 NEMATODE, Root Knot. **Meloidogyne** sp., AZ.  
 SPOT ANTHRACNOSE. **Sphaceloma lippiae**, IN, FL.

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### Lipstick Vine (*Aeschynanthus*)

LEAF SPOT. **Corynespora casiicola**, FL;  
**Myrothecium roridum**, FL.  
 VIRUS. **Tomato Spotted Wilt**, PA.

**Lisianthus (*Eustoma grandiflora*)**

ROT, Root. *Pythium irregulare*, CA.  
 VIRUS, Yellow and Necrotic Leaf Spots. **Moroccan Pepper Virus**, Iran.

**Lithocarpus (Tanbark Oak)**

BLIGHT, Leaf. *Pestalotia castagnei*, CA.  
 BLIGHT, Sudden Oak Death. *Phytophthora ramorum*, CA, OR.  
 CANKER. *Phytophthora ramorum*, *P. nemorosa*, *P. gonapodyides*, *P. cambivora*, *P. siskiyouensis*, *P. taxon*, OR.  
 LEAF SPOT. *Ceuthocarpum conflictum*, CA.  
 POWDERY MILDEW. *Erysiphe trina*, CA.  
 ROT, Wood. *Poria* spp.; *Stereum hirsutum*.  
 RUST. *Cronartium quercuum* (II, III), CA; 0, I on pine.  
 WILT. *Phytophthora ramorum*, CA, OR.

**Lithophragma (Woodland-Star)**

RUST. *Puccinia heucherae* (III), CA, UT, WA.  
 SMUT, Leaf and Stem. *Urocystis lithophragmae*, UT.

**Lithospermum (Gromwell, Puccoon)**

LEAF SPOT. *Septoria lithospermi*, WI.  
 POWDERY MILDEW. *Golovinomyces cichoracearum*, PA, TX.  
 RUST. *Aecidium hesleri*, TN; *Puccinia recondita* (0, I), NE, ND, SD, TX.

**Litsea (Pond-Spice)**

LEAF SPOT. *Cercospora olivacea*, GA.  
 WILT, Laurel. *Raffaelea lauricola*, FL.

**Lobelia (Cardinal-Flower, Blue Lobelia)**

BACTERIAL BLIGHT. *Pseudomonas cichorii*, WA.  
 BLIGHT, Gray Mold. *Botrytis cinerea*.  
 DAMPING-OFF. *Pythium debaryanum*, MA, NY.  
 LEAF SPOT. *Cercospora lobeliae*, AL, IL, IN, KS, MD, TX; *C. effusa*, IA, TX; *Phyllosticta bridgesii*, IN; *Septoria lobeliae*, ME to VA, TX, WI.  
 NEMATODE, Root Knot. *Meloidogyne* spp., FL, MD, NE, NY.  
 ROT, Root. *Phymatotrichum omnivorum*, TX; *Rhizoctonia solani*, NY, OH.  
 ROT, Stem. *Sclerotium rolfsii*, NJ.  
 RUST. *Puccinia lobeliae* (III), AR, MI, WI, NY to NC, TX, WA.  
 SMUT, Leaf. *Entyloma lobeliae*, ME to PA, MO, WI.  
 VIRUS. **Beet Curly Top**, TX; **Tomato Spotted Wilt**, TX.

**Locust (*Robinia*)**

ANTHRACNOSE; BLACK LOCUST. *Colletotrichum gloeosporioides*, GA, SC.  
 BACTERIAL, MLO. **Witches' Broom**, VA.  
 BLIGHT, Seedling; Leaf. *Alternaria* sp., NC to AL, MO; *Fusicladium robiniae*, MD to AL, MO, WI.  
 CANKER. *Nectria cinnabarina*, VA.  
 CANKER; Twig Blight. *Aglaospora anomala*, ME to GA; *Fusarium sarcochroum*, IA; *Diaporthe oncostoma*, NY to GA, IL.  
 DAMPING-OFF. *Rhizoctonia solani*, ME to AL, NE, TX; *Pythium* spp., NE, TX.  
 DODDER. *Cuscuta* sp.; *C. arvensis*, widespread.  
 LEAF SPOT. *Cladosporium epiphyllum*, TN, VA, WV; *Cylindrosporium solitarium*, TX; *Gloeosporium revolutum*, NJ; *Phloeospora robiniae*, NY to OH; *Phyllosticta robiniae*, LA.  
 MISTLETOE. *Phoradendron serotinum* (*flavescens*), AZ, NM, NC, TX; *Viscum album*, CA.  
 NEMATODE, Lesion. *Pratylenchus* sp., OR.

NEMATODE, Root Knot. *Meloidogyne* spp., OK, TX.  
NONPARASITIC Chlorosis. Iron Deficiency,  
NE, TX.

**Little Leaf.** Zinc deficiency, CA.

POWDERY MILDEW. *Erysiphe polygoni*, CA;  
*Microsphaera diffusa*, IL, NC; *Phyllactinia*  
*corylea*, NM.

ROT, Heart. *Fomes* spp., *F. rimosus*, VA;  
*Polyporus* spp.

ROT, Root. *Armillaria mellea*; *Phymato-*  
*trichum omnivorum*, NM, OK; *Pythium*  
*myriotylum*, NC; *Fusarium* sp., AL, GA.

ROT, Seedling Stem. *Phytophthora cinnamomi*,  
MD; *Rhizoctonia bataticola*, AL, NC; *Scle-*  
*rotium bataticola*, TX.

ROT, Wood. *Daedalea unicolor*, WI; *Poria* spp.

VIRUS. **Locust Witches' Broom**, Robinia  
Brooming Disease, PA to GA, AR, OH.

WILT, Seedling. *Phytophthora parasitica*, AL,  
NC, VA; *Verticillium albo-atrum*, IL.

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## Loganberry

► Blackberry.

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## Lomatium (Biscuit-Root)

DOWNY MILDEW. *Plasmopara nivea*, MT.

LEAF SPOT. *Phyllachora* sp., WA.

RUST. *Puccinia asperior* (0, I, III), CA, OR, WA;  
*P. jonesii* (0, I, III), KS, NE, UT, WA;  
*P. ligustici*, ID, WA.

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## Loosestrife, Fringed (*Steironema*)

LEAF SPOT. *Cylindrosporium steironematis*,  
NY; *Mycosphaerella* sp., NY; *Phyllosticta*  
*lysimachiae*, NY; *Ramularia lysimachiae*,  
NC, WI; *Septoria conspicua*, ME to MS,  
CO, WI.

ROT, Root. *Phymatotrichum omnivorum*, TX.

RUST. *Puccinia dayi*, NY to WV, IL, MI, MT,  
WI; *P. distichlidis* (0, I), CO, ND; II, III on  
marsh grass; *Uromyces acuminatus* (0, I), CT  
to CO, ND, SD.

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## Loosestrife, Moneywort (*Lysimachia*)

BLIGHT, Leaf and Stem Necrosis.  
*Ceratobasidium anceps*, WI.

GALL, Leaf. *Synchytrium aureum*, WI.

LEAF SPOT. *Cercospora lysimachiae*, NJ;  
*Cladosporium lysimachiae*, MA;  
*Ramularia lysimachiae*, WI; *Septoria*  
*conspicua*, IA, NY, VT.

NEMATODE, Root Knot. *Meloidogyne* sp., TX.

NEMATODE, Stem. *Ditylenchus dipsaci*.

ROT, Crown Stem. *Sclerotium rolfsii*, KS;  
*Phymatotrichum omnivorum*, TX.

RUST. *Coleosporium campanulae* (II, III), TN;  
0, I on red pine; *Puccinia limosae* (0, I), MA  
to NC, MI, NE, WI.

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## Loquat (*Eriobotrya*)

ANTHRACNOSE; Flower Blight; Withertip.  
*Colletotrichum gloeosporioides*, CA, FL, TX.

BACTERIAL Fire Blight. *Erwinia amylovora*, Gulf  
states, AZ, CA.

BLIGHT, Leaf; Blotch. *Fabraea maculata*, FL.

LEAF SPOT. *Phyllosticta eriobotryae*, FL;  
*Pestalotia* sp., secondary; *Septoria*  
*eriobotryae*, FL.

LEAF SPOT, Algal. *Cephaleuros virescens*, FL.

NEMATODE, Burrowing. *Radopholus similis*, FL.

ROT, Collar, Crown. *Phytophthora cactorum*,  
CA.

ROT, Root. *Armillaria mellea*, CA; *Clitocybe*  
*tabescens*, FL; *Phymatotrichum*  
*omnivorum*, TX.

SCAB. *Fusicladium eriobotryae*, on leaves,  
stems, fruit, Gulf states; *Spilocaea*  
*eriobotryae* (*Fusicladium photinicola*).

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## Lotus (*Nelumbo*)

BLIGHT. *Dothiorella nelumbonis*, on flower  
parts, DE, MD.

LEAF SPOT. *Alternaria nelumbii*, MD, NJ, NY,  
OK, PA, TX; *Cercospora nelumbonis*,  
IN, TX.



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## Lucuma (Canistel, Egg-Fruit)

ANTHRACNOSE; Fruit Spot. *Colletotrichum gloeosporioides*, FL.

CANKER. *Physalospora obtusa*, SC.

RUST. *Achrotelium lucumae* (II, III), FL.

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## Ludwigia (False Loosestrife)

LEAF SPOT. *Cercospora ludwigiae*, AL; *Peizella oenotherae*, VA; *Phyllosticta ludwigiae*, NY, WI; *Septoria ludwigiae*, MD, MS, PA.

RUST. *Puccinia jussiaeae* (0, I, III), DE to FL, CA, LA, MS, OH, TX, WI.

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## Lupine (*Lupinus*)

ANTHRACNOSE. *Colletotrichum trifolii*, NC; *C. fragariae*, NC.

BACTERIAL Drippy Pod. *Brenneria quercina* pv. *lupinicola*, WA, Pacific northwest.

BLIGHT, Gray Mold. *Botrytis cinerea*, MA, MT, NY.

BLIGHT, Leaf. *Hadrotrichum globiferum*, CA, CO, OR, WA, WY.

BLIGHT, Seedling. *Pleiochaeta setosa*, *Alternaria* sp., *Aspergillus flavus*, *Aspergillus niger*, *Curvularia* sp., *Rhizopus stolonifer*.

BLIGHT, Southern. *Sclerotium rolfsii*, probably general.

BLIGHT, Stem Necrosis. *Ascochyta* sp., CT, WI; *Alternaria alternata* (Bluebonnet), TX.

BROWN SPOT. *Pleiochaeta setosa*, Nova Scotia, Canada.

DAMPING-OFF. *Rhizoctonia solani*, CT, TX.

DOWNY MILDEW. *Peronospora trifoliorum*, WI.

LEAF SPOT. *Alternaria* sp., MA; *Cercospora longispora*, FL, MO, NY, WI; *C. lupini*, FL, OR, SC; *C. lupinicola*, TX; *Corynespora cassiicola*, TX; *Cylindrosporium lupini*, CA; *Mycosphaerella pinodes*, WI; *Ovularia*

*lupinicola*, WA; *Phoma lupini*, also stem spot, CO to NM, CA; *Phyllosticta ferax*, CA to WA, WY, SD to CO; *P. lupini*, CA; *Ramularia lupini*, TX; *Septogloeum lupini*, CA, MI; *Septoria lupinicola*, WI; *Stictochlorella lupini*, CA, WA.

LESION, STEM. *Phoma* sp.

NEMATODE, Leaf. *Aphelenchoides ritzemabosi*.

NEMATODE, LESION. *Pratylenchus pratensis*, CA.

NEMATODE, Root Knot. *Meloidogyne* sp., FL.

NEMATODE, Sting. *Belonolaimus gracilis*, GA; ring, *Criconema* sp., CA.

POWDERY MILDEW. *Microsphaera* sp.; *Erysiphe polygoni*, widespread; *Ovulariopsis* sp. (Bluebonnets), NM.

ROT, Root. *Armillaria mellea*, CA; *Fusarium* sp., NJ, VA; *Phymatotrichum omnivorum*, TX; *Pythium ultimum*, CA; *Thielaviopsis basicola*, IA, WI.

ROT, Root, Crown, Stem. *Pythium paroecandrum*, NM.

ROT, Stem. *Macrophomina phaseoli*, charcoal rot; *Sclerotinia sclerotiorum*, LA, NY, TX; *Pythium debaryanum*, TX, CA; *Rhizoctonia solani*, Alberta, Canada.

RUST. *Puccinia andropogonis* var. *onobrychidis* (0, I), MI, MN, NY, WI; II, III on *Andropogon*; *Uromyces lupini* (0, I, II, III), CA, MT, NE, OR, WA; *U. occidentalis* (II, III), on native lupine, MT to NM, CA, WA.

SMUT. *Thecaphora deformans*, on seed, CO, WY.

VIRUS. **Bean Yellow Mosaic**, FL, WA; **Bidens Mottle**, FL; **Ring Spot**. Unidentified; **Tomato Spotted Wilt**, TX; **Peanut Mottle**, GA; (Stunt/Vein Clearing) **Tombusvirus**, AK.

WILT. *Sclerotinia minor*, TX.

These diseases are of lupines grown as ornamentals. Lupines as ground covers and soil preservers have their own troubles. In gardens powdery mildew is prevalent, and leaf spots are not often important.

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## Lychee

ROT, Mushroom Rot. *Clitocybe tabescens*, sometimes fatal in FL.

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## Lychnis (Campion)

BLIGHT, Shoot and Flower. *Botrytis cinerea*, AK.  
 BLIGHT, Southern. *Sclerotium rolfsii*, TX.  
 LEAF SPOT. *Alternaria dianthi*, AK;  
*Leptothyrium lychnidis*, AL; *Phyllosticta lychnidis*, IA, TX; *Septoria lychnidis*, MA.  
 MOLD, Leaf. *Heterosporium* sp., AK.  
 ROT, Root. *Phymatotrichum omnivorum*, TX;  
*Rhizoctonia solani*, IL; *Corticium galactinum*, MD.  
 ROT, Stem. *Phytophthora cactorum*, IN.  
 RUST. *Puccinia arenariae* (III), PA; *Uromyces suksdorfii* (I, II, III), UT; *U. verruculosus*, IN, MI, NY, TX.  
 SMUT, Anther. *Ustilago violacea*, MN, WI, WY.

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## Lycium (Desert-Thorn, Christmasberry)

LEAF SPOT. *Cercospora lycii*, OK.  
 POWDERY MILDEW. *Arthrocladiella mongeotii*, WA.  
 ROT, Root. *Phymatotrichum omnivorum*, TX.  
 RUST. *Aecidium lycii* (0, I), AZ; *Puccinia globosipes* (II, III), UT to NM, CA; 0, I unknown; *P. tumidipes* (II, III), TX to AZ, UT.

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## Lycoris

LEAF SCORCH; Red Spot. *Stagonospora curtisii*, CA.  
 NEMATODE, Bulb Scale Rot. *Ditylenchus dipsaci*, NC, VA; *Aphelenchoides fragariae*, FL, GA, ND, SD.  
 NEMATODE, Root. *Hoplolaimus* sp., NC.

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## Lyonia (Maleberry, Fetterbush, Staggebush)

BLACK MILDEW. *Asterina lepidigena*, FL;  
*Lembosia andromedae*, AL; *Morenoella dothideoides*, FL.

BLIGHT, Leaf. *Ramularia cylindriopsis*, ME.  
 DODDER. *Cuscuta compacta*, FL.  
 GALL, Leaf; Shoot Hypertrophy. *Exobasidium vaccinii*, MA to FL, AL.  
 LEAF SPOT. *Ceuthocarpon ferrugineum*, FL;  
*Pestalotia vaccinii*, secondary; *Septoria pulchella*, GA.  
 LEAF SPOT, Tar. *Rhytisma andromedae*, widespread; *R. decolorans*, MS.  
 POWDERY MILDEW. *Microsphaera alni* var. *vaccinii*, AL.  
 ROT, Wood. *Poria versipora*, ME.  
 RUST. *Pucciniastrum myrtilli* (II, III), DE to AL, AR; 0, I on hemlock.

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## Lysiloma

ROT, White Pocket Heart. *Fomes extensus*, FL.  
 RUST. *Ravenelia annulata* (II, III), FL;  
*R. lysilomae*, FL.

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## Lythrum (Winged, Purple Loosestrife)

GALL, Leaf. *Synchytrium lythrii*, LA.  
 LEAF SPOT. *Cercospora lythri*, WI;  
*C. lythracearum*, MS; *Pezizella oenotherae*, MI, NY; *Septoria lythrina*, KS, NY, WI.  
 ROT, Root. *Rhizoctonia solani*, IL.

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## Maackia

ROT, Root. *Phymatotrichum omnivorum*, TX.

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## Macadamia

CANKER. *Phytophthora cinnamomi*, CA.  
 DECLINE, Quick. *Phytophthora tropicalis*, HI.

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## Madrone (*Arbutus menziesii*)

BLIGHT (Sudden Oak Death). *Phytophthora ramorum*, CA.

CANKER. *Hendersonula toruloidea*, WA;  
**Fusicoccum** sp., western North America.  
 CANKER, Trunk. *Phytophthora cactorum*, CA,  
 WA.  
 GALL, Leaf; Red Leaf Spot. *Exobasidium*  
**vaccinii**, CA, OR, TX, WA.  
 LEAF SPOT. *Ascochyta hanseni*, CA;  
**Cryptostictis arbuti**, CA, OR;  
**Didymosporium arbuticola**, OR;  
**Mycosphaerella arbuticola**, CA, OR, WA;  
**Phyllosticta fimbriata**, OR.  
 LEAF SPOT, Tar. *Rhytisma arbuti*, CO, OR, TX,  
 WA.  
 ROT, Heart. *Fomes subroseus*, OR.  
 ROT, Root. *Phymatotrichum omnivorum*, TX.  
 ROT, Wood. *Lenzites saepiaria*, OR, TX;  
**Polyporus** spp., OR, TX; *Trametes sepium*,  
 CA.  
 RUST. *Puccinastrum sparsum* (II, III), CA, OR,  
 WA.  
 SPOT ANTHRACNOSE. *Elsinoë mattirolanum*, CA.

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## Magnolia

BACTERIAL Leaf Spot. *Pseudomonas syringae*,  
 IL; *P. cichorii*, AL.  
 BLACK MILDEW. *Dimerosporium magnoliae*,  
 TX; *Irene araliae*, MS; *Meliola*  
**amphitricha**, Gulf states; *M. magnoliae*;  
*Trichodothis comata*, South.  
 BLIGHT, Seedling. *Rhizoctonia solani*, NJ.  
 BLIGHT, Thread. *Pellicularia solani*, NJ.  
 CANKER, Felt Fungus. *Septobasidium langoisii*,  
**S. tenui**, **S. lepreurii**, Gulf states.  
 CANKER; Twig Blight. *Nectria* sp., WV;  
**N. magnoliae**, NJ, TN, WV; *Tubercularia*  
 sp., MI.  
 LEAF SPOT. *Alternaria tenuis*, TX;  
**Cladosporium fasciculatum**, GA to TX;  
**Cercospora magnoliae** (*Mycosphaerella*  
*milleri*), FL, NJ, NC, SC, WV; *Cristulariella*  
**pyramidalis**; *Colletotrichum* sp., FL, GA,  
 SC; *Coniothyrium* sp., TX; *C. olivaceum*,  
 TX; *Epicoccum nigrum*, TX; *Exophoma*  
**magnoliae**, FL, TX; *Glomerella cingulata*,  
 AL, FL, GA, LA, MS, SC, TX; *Hendersonia*

**magnoliae**, VA; *Heterosporium magnoliae*,  
 FL, NC, TX; *Micropeltis alabamensis*, AL;  
**cookei**, NY to Gulf states, CA; **P. magnoliae**,  
 large leaf spot, NY to Gulf states, CA;  
**Septoria magnoliae**, SC to FL, TX.  
 LEAF SPOT; Algal; Green Scurf; "Red Rust".  
**Cephaleuros virescens**, general.  
 NEMATODE, Burrowing. *Radopholus similis*, FL.  
 NEMATODE, Citrus. *Tylenchulus semipenetrans*,  
 FL.  
 NEMATODE, Lance. *Hoplolaimus uniformis*, RI.  
 NEMATODE, Lesion. *Pratylenchus pratensis*.  
 NEMATODE, Root Knot. *Meloidogyne* sp.  
 NEMATODE, Sting. *Belonolaimus longicaudatus*,  
 FL.  
 PARASITIC LICHEN. *Strigula elegans* and  
**S. complanata**, Southern U.S., LA.  
 ROT, Flower. *Ciborinia (Sclerotinia) gracilipes*,  
 MD.  
 ROT, Heart. *Fomes fasciatus*; **F. geotropus**.  
 ROT, Root. *Phymatotrichum omnivorum*, TX;  
**Clitocybe tabescens**, GA.  
 ROT, Wood. *Daldinia concentrica*, cosmopol-  
 itan; **Polyporus** spp.; *Poria* spp., *Stereum* spp.  
 SPOT ANTHRACNOSE. *Elsinoë magnoliae*, FL, GA,  
 LA, MS.  
 WILT. *Verticillium albo-atrum*, CA, IN.

The many leaf spots need not be alarming;  
 they seldom cause premature defoliation. In the  
 Gulf states lichens appear as small round gray  
 spots on leaves, and the parasitic alga  
*Cephaleuros* often forms a velvety coating with  
 hairlike outgrowths.

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## Mahogany (*Swietenia*)

BLIGHT, Twig, Stem. *Phomopsis* sp., OR.  
 LEAF SPOT. *Pestalotia swieteniae*, FL;  
**Phyllachora swieteniae**, FL.

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## Mahonia (Oregon-Grape)

CANKER; Leaf Blotch. *Leptosphaeria*  
**berberidis**, ID, MD.  
 LEAF SPOT. *Cercospora* sp., LA; *Gloeosporium*  
**berberidis**, WA; *Phomopsis* sp., secondary;

**Phyllosticta** spp., AL, CT, WA;  
**Cylindrocladium** sp., FL, GA.

NEMATODE, Root Knot. **Meloidogyne** sp.

NONPARASITIC. **Scald**. In eastern states winter injury to foliage is severe.

PARASITIC LICHEN. **Strigula elegans** and **S. complanata**, Southern U.S., LA.

ROT, Root. **Phymatotrichum omnivorum**, TX.

RUST. **Cumminsia mirabilissima** (0, I, II, III), common Western Great Plains to Pacific Coast; **C. texana**, TX; **C. wootoniana** (II, III), AZ, NM; **Puccinia graminis** (0, I), CA, MI, ND; II, III on cereals and grasses; **P. koeleriae** (0, I), CO, ID, MT, OR; II, III on *Koeleria*; **P. oxalidis** (0, I), NM; II, III on *Oxalis*.

Rust due to *Cumminsia* is usually inconspicuous, but in a wet season there is a general blighted effect. *Mahonia*, like barberry, is under wheat-rust quarantine. *Mahonia repens* is immune.

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## Maianthemum

BLIGHT. **Botrytis** sp., NY.

LEAF SPOT. **Ramularia rubicunda**, MI, NY, OH, PA, WI, CA to AK; **Sphaeropsis cruenta**, AK, WA.

RUST. **Puccinia sessilis** (0, I), MA, MI, MN, NY, PA, WI; II, III on *Phalaris*; **Uromyces acuminatus** var. **magnatus** (0, I), MI, NY, WI; II, III on marsh grass.

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## Malachra

LEAF SPOT. **Cercospora malachrae**, TX.

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## Malacothrix

GALL, Leaf. **Synchytrium innominatum**, CA.

RUST. **Puccinia harknessii** (III), CA; **P. hieracii** (0, I, II, III), CA.

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## Mallotus

LEAF SPOT. **Cercospora malloti**, MS.

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## Mallow, Garden (*Malva*)

BACTERIAL, MLO. **California Aster Yellows**, CA; **Beet Curly Top**, CA.

LEAF SPOT. **Alternaria** sp.

ROT, Root. **Macrophomina phaseoli**, CA on *Malva parviflora*; **Phymatotrichum omnivorum**, TX.

RUST. **Puccinia heterospora** (III), KS, TX; **P. malvacearum**, CA, CO, OR, WV.

VIRUS. **Malva Vein Clearing**, CA.

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## Malvastrum (False-Mallow, Bush-Mallow)

ROT, Root. **Phymatotrichum omnivorum**, TX.

RUST. **Puccinia interveniens** (0, I), CA; III on *Stipa*; **P. malvacearum**; **P. schedonnardi** (0, I), MT, ND to NM; II, III on wild grasses; **P. sherardiana** (0, III), MT, ND to TX, NM; **P. heterospora** (III), TX.

VIRUS. **Begomoviruses** (especially in Malvaceous weed species), Yucatan Peninsula.

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## Malvaviscus

BLIGHT, Twig. **Sclerotinia sclerotiorum**, TX.

LEAF SPOT. **Phyllosticta malvavisci**, TX.

ROT, Root. **Clitocybe tabescens**, FL; **Helicobasidium purpureum**, TX; **Phymatotrichum omnivorum**, TX.

RUST. **Kuehneola malvicola** (II, III), TX; **Puccinia heterospora** (III), TX.

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## Mandevilla (*Mandevilla splendens*)

BACTERIAL Wilt. **Ralstonia solanaceum**, IN, MI, MN, OH.

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**Manfreda (Spice-Lily, Wild Tuberose)**

LEAF SPOT. *Cercospora amaryllidis*, TX;  
*Phyllosticta hymenocallidis*, TX.  
 RUST. *Aecidium modestum*, TX.

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**Mango (*Mangifera*)**

ANTHRACNOSE; Flower and Twig Blight; Fruit  
 Rot. *Glomerella cingulata*, cosmopolitan.  
 BLIGHT, Twig. *Phomopsis* sp., FL; *Physalospora*  
 (*Diplodia*) spp.  
 CANKER, Brown Felt. *Septobasidium pilosum*  
 and *S. pseudopedicellatum*, FL.  
 DIEBACK. *Neofusicoccum parvum*, Peru.  
 GALL, ON TREE. *Fusarium decemcellulare*, FL.  
 LEAF SPOT. *Phyllosticta mortoni*, FL, TX;  
*Septoria* sp., FL.  
 LEAF SPOT, Algal, Green Scurf. *Cephaleuros*  
*virescens*, general.  
 NONPARASITIC. Little Leaf. Zinc deficiency, FL.  
 Soft Nose. On Indian varieties.  
 POWDERY MILDEW. *Oidium mangiferae*, CA, FL.  
 ROT, Root. *Phymatotrichum omnivorum*, TX.  
 ROT, Root and Crown. *Phytophthora*  
*palmivora*, AZ.  
 ROT, Stem-end Fruit. *Diplodia* sp.  
 SOOTY MOLD. *Capnodium* spp., general.  
 SPOT ANTHRACNOSE; Mango Scab. *Elsinoë*  
*mangiferae*, FL.  
 WILT. *Verticillium albo-atrum*, FL.

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**Mangrove (*Rhizophora*)**

LEAF SPOT. *Cercospora rhizophorae*, FL.

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**Manihot (Cassava, Manioc)**

ANTHRACNOSE; Withertip. *Gloeosporium*  
*manihotis*, FL, LA, TX.  
 DIEBACK. *Physalospora abdita* and *P. rhodina*,  
 FL.  
 LEAF SPOT. *Cercospora henningsii*, FL, TX.  
 NEMATODE, Root Knot. *Meloidogyne* sp., AL, FL.

ROT, Root. *Phymatotrichum omnivorum*, TX;  
*Rhizoctonia solani*, FL.  
 VIRUS. Cassava Common Mosaic, FL.

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**Manzanita (*Arctostaphylos*)**

BLACK MILDEW. *Meliola* sp., CA.  
 BLIGHT (Sudden Oak Death). *Phytophthora*  
*ramorum*, CA.  
 GALL, Red Leaf Spot. *Exobasidium vaccinii*,  
 widespread; shoot gall, *E. vaccinii-uliginosi*,  
 CA, OR.  
 LEAF SPOT. *Cryptostictis arbuti*, OR;  
*Phyllosticta amicta*, CA, OR.  
 MISTLETOE. *Phoradendron villosum*, CA, OR.  
 ROT, Root. *Phymatotrichum omnivorum*, TX.  
 ROT, Root and Crown. *Phytophthora*  
*cinnamomi*, CA.  
 ROT, Wood. *Fomes annosus*, CA;  
*F. arctostaphyli*, and *F. igniarius*, general;  
*Poria ferruginosa*.  
 RUST. *Pucciniastrum sparsum* (II, III), CA, OR.

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**Maple (*Acer*)**

ANTHRACNOSE; Leaf Blight. *Discula campestris*,  
 WI; *Gloeosporium apocryptum*, large  
 blotches, general; *G. acerinum*, small spots;  
*G. saccharinum*; *G. aceris*.  
 BACTERIAL Crown Gall. *Agrobacterium*  
*tumefaciens*, MI, OK, TX, VA.  
 BACTERIAL Leaf Scorch. *Xylella fastidiosa*, KY.  
 BACTERIAL Leaf Spot. *Pseudomonas aceris*, on  
 Japanese maple, CA; *P. acernea*.  
 BLIGHT, Inflorescence. *Ciborinia acerina*, MA,  
 NY.  
 BLIGHT, Leaf. *Didymosporina aceris*, CT, PA.  
 BLIGHT, Seedling; Smother. *Thelephora albido-*  
*brunnea*, NC, VA.  
 BLIGHT, Sudden Oak Death. *Phytophthora*  
*ramorum*, CA.  
 BLIGHT, Twig. *Macrophoma* sp., AR, NY.  
 CANKER, Bark. *Aleurodiscus acerinus*, MA, VT;  
*Hymenochaete agglutinans*, CT, MI, MT.  
 CANKER, Basal, Crown. *Phytophthora*  
*cinnamomi*, NJ; *P. cambivora*, NJ.

- CANKER, Bleeding. **Phytophthora cactorum**, CT, MA, NJ, NV, NY, RI, VA; **P. citricola**, NV.
- CANKER; DIEBACK. **Colletotrichum acutatum**, on Japanese maple, CT; **Coniothyrium negundinis**, IL, OK; **Cytospora** spp., MI; **Eutypella parasitica**, MI, MN, NH, NY, VT, WI; **Hypoxyton morsei**, MI, MN; **Fusarium** spp.; **Nectria cinnabarina**, cosmopolitan, often secondary; **N. coccinea**; **N. galligena**, widespread trunk canker; **Phomopsis** sp., OH; **P. acerina**, NY; **Physalospora** spp., secondary; **Sphaeropsis albescens**, IL, IA, KS, NY, ND, SD, WI; **Strumella coryneoidea**, MI, PA; **Schizoxylon microsporum**, Lake states; **Stegosporium acerinum**, NJ.
- CANKER, Felt Fungus. **Septobasidium** spp., AL, FL, KY, LA, NC, SC, TN, VA.
- DAMPING-OFF. **Rhizoctonia solani**, cosmopolitan.
- DODDER. **Cuscuta gronovii**, on seedlings, NY.
- LEAF BLISTER. **Taphrina carveri**, AL, KY, MI, MO; **T. bartholomaei**, UT; **T. darkeri**, OR; **T. dearnessii**, black, GA, MI, MN, NC, NY, OK, PA, VA; **T. sacchari**, on sugar maple, AR, GA, IN, KS, ME, MI, MO, NH, NY, OH, PA, TN, WV, WI.
- LEAF SPOT. **Actinopelte dryina**, IL; **Alternaria** sp., secondary; **Cercospora negundinis**, KS, NE, WI; **C. saccharini**, MA; **Cercospora aceris**, WA; **Cristulariella depraedens**, CT, NY; **C. pyramidalis**, FL; **Monochaetia desmazierii**, GA, NC, OK, TN; **Illosporium maculicola**, WA; **Laestadia brunnea**, NC, SC; **Leptothyrella acerinum**, OK; **Marssonina truncatula**, OR; **Pezizella oenotherae**, NY, NC, VA; **Phyllosticta minima**, eyespot, general; **P. negundinis**, ME to AL, TX, WI; **Piggotia negundinis**, leaf blotch, WI, WY; **Stilbella acerina**, PA; **Septoria aceris**, general; **Venturia acerina**, NY, PA, VA, WV, WI.
- LEAF SPOT, Tar. **Rhytisma acerinum**, general; **R. punctatum**, speckled, general.
- MISTLETOE. **Phoradendron serotinum (flavescens)**, common from NJ to FL, MO, TX.
- MISTLETOE. **Viscum album** on Big Leaf Maple (*Acer macrophyllum*) and Silver Maple (*A. saccharinum*), CA.
- NEMATODE. **Criconemoides** sp.; **Hemicycliophora** sp.; **Pratylenchus sp. thornei**; **Tylenchorhynchus** sp.; **Xiphinema** sp.
- NEMATODE, Root Knot. **Meloidogyne** sp., OR; **M. ovalis**, WI.
- NONPARASITIC. **Leaf Scorch**. Common on street and lawn trees, associated often with high temperature after a moist spring.
- Decline**. Frequently roadside salt injury.
- Frost Crack**. Gas Injury.
- PARASITIC LICHEN. **Strigula elegans** and **S. camplanata**, Southern U.S., LA.
- POWDERY MILDEW. **Phyllactinia corylea**, CA, IA, NC, OR, SD, VT; **Uncinula circinata**, ME to AL, MI, MO, TX; **Microsphaera alni**; **Sawadaea bicornis**, ID, WA; **S. tulasnei**, NY, WI, Montreal, Canada.
- ROT, Heart, Sapwood, Wound. **Collybia velutipes**, CT, MA; **Daedalea** spp., northeastern and north central states, southward; **Daldinia concentrica**, cosmopolitan; **Fomes applanatus**; **F. connatus**; **F. ignarius**; **Ganoderma lucidum**, fatal to some street trees, NJ, NY; **Hericium erinaceous**, VT to MD, MI, MN; **Lenzites** spp.; **Pholiota adiposa**; **Pleurotus** spp.; **Polyporus** spp.; **Poria** spp.; **Steccherinum septentrionale**, general; **Stereum** spp.; **Schizophyllum commune**, cosmopolitan; **Ustulina vulgaris**, northeastern and north central states; **Valsa leucosomoides**, on tapped sugar maples.
- ROT, Root. **Armillaria mellea**, general; **Clitocybe tabescens**, GA, MO; **Helicobasidium purpureum**, TX; **Phymatotrichum omnivorum**, TX.
- ROT, Sapstreak. **Endoconidiophora virescens**; **Ceratocystis coeruleascens**.
- ROT, Seedling, Charcoal. **Macrophomina phaseoli**, IL.
- VIRUS. **Peach Rosette**; **Tobacco Necrotic Ring Spot**.
- WILT. **Verticillium albo-atrum**, widespread in cultivated trees, especially Norway maple.

Verticillium wilt is the most destructive maple disease and is particularly prevalent in street trees. The wilting may be confined to a single branch, which can be cut out, or may kill the whole tree. In removing dead trees, get all of the root system and replace with a different kind of tree. Leaf scorch is common on sugar maple in hot, windy weather; anthracnose may be conspicuous in wet weather.

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## Marah

VIRUS. Wild Cucumber Mosaic, CA, OR.

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## Maranta (*Calathea*)

LEAF SPOT. *Glomerella cincta*, NJ; *Phyllosticta* sp., NJ; *Drechslera setariae*, FL.  
RUST. *Puccinia cannae* (II, III), FL.  
VIRUS, Mosaic. Sugarcane Mosaic, FL.

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## Marguerite (*Argyranthemum frutescens*)

BACTERIAL Crown Gall. *Agrobacterium tumefaciens*, IA, MD, NJ, NY, VA.  
BACTERIAL, MLO. Aster Yellows, KS, NJ, NY, and California Aster Yellows, CA.  
DOWNY MILDEW. *Peronospora radii*, CA.  
NEMATODE, Root Knot. *Meloidogyne* sp.  
POWDERY MILDEW. *Golovinomyces cichoracearum*, NJ.  
VIRUS. Beet Curly Top, CA.  
WILT. *Verticillium albo-atrum*, NJ.

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## Marigold (*Tagetes*)

BACTERIAL Leaf Spot. *Pseudomonas syringae* pv. *tagetis*, NC.  
BACTERIAL, MLO. Aster Yellows, CT, NJ, NY, PA, WI; California Aster Yellows, CA.  
BACTERIAL Wilt. *Pseudomonas solanacearum*, FL.  
BLIGHT. *Alternaria tagetica*, SC.

BLIGHT, Head. *Botrytis cinerea*, AK, CT, NJ, PA; *Helminthosporium* sp., TX.

BLIGHT, Southern. *Sclerotium rolfsii*, FL, NJ, VA.

LEAF SPOT. *Alternaria tagetica*, SC, NJ; *Cercospora* sp., CT, *C. tagetica*, FL; *Septoria tagetica*, FL.

NEMATODE. *Aphelenchoides tagetae*, MD; *Paratylenchus micoletzkyi*, MD.

NEMATODE, Root Knot. *Meloidogyne hapla*, VA.

NONPARASITIC Air Pollution. NO<sub>2</sub>, SO<sub>3</sub>, O<sub>3</sub>, NC.

ROT, Charcoal. *Macrophomina phaseoli*, OK.

ROT, Root. *Pythium ultimum*, CA; *Rhizoctonia solani*, TX.

ROT, Stem; Wilt. *Sclerotinia sclerotiorum*, NY; *Phytophthora cryptogea*, NY; *Fusarium* sp., CA, NJ, NY.

RUST. *Coleosporium madaiae* (II, III), CA; 0, I on pine; *Puccinia tagetica* (II, III), TX.

VIRUS. Cucumber Mosaic, FL.

WILT. *Fusarium oxysporum* f. sp. *callistephi*, CA; *Verticillium albo-atrum*, NY; *V. dahliae*, AZ.

Marigolds are easy to grow without paying too much attention to disease. Cut fading flower heads off into a paper bag before the gray mold of *Botrytis* blight gets started.

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## Mariposa-Lily, Globe-Tulip (*Calochortus*)

RUST. *Puccinia calochorti* (0, I, III), CA, OR, WA to NE, NM.

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## Marshelder (*Iva xanthifolia*)

DOWNY MILDEW. *Plasmopara halstedii*, ND.

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## Marsh-Marigold (*Caltha*)

GALL, Leaf. *Synchytrium aureum*, WI.

LEAF SPOT. *Cercospora calthae*, WI; *Cylindrosporium* sp., NY; *Fabraea rousseauana*, CA, WI; *Ramularia calthae*, NY, WI.

POWDERY MILDEW. *Erysiphe polygoni*, MI, OH, WI.

RUST. *Puccinia areolata* (0, I, II, III), AK, CA, CO, WA; *P. calthae* (0, I, II, III), NY, NJ to IA, ND; *P. calthicola* (0, I, II, III), NY to IA, MN; *P. gemella* (III), AK, CA, ID, MT, OR, WA; *P. treleasiana* (III), CO, NV, UT, WA, WY.

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### Matelea

PARASITIC LICHEN. *Strigula elegans*; *S. complanata*, Southern U.S., LA.

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### Matricaria (False Chamomile)

BACTERIAL, MLO. California Aster Yellows, CA.

NEMATODE, Root Knot. *Meloidogyne* sp., CA.

POWDERY MILDEW. *Golovinomyces cichoracearum*, WA; *Sphaerotheca macularis*, WA.

WHITE RUST. *Albugo tragopogonis*, CA, ND, OR.

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### Matrimony-Vine (*Lycium halimifolium*)

LEAF SPOT. *Alternaria* sp., IA; *Cercospora lycii*, IA; *Phyllosticta lycii*, NY, OH.

POWDERY MILDEW. *Erysiphe polygoni*, CT, DE, MD, NJ, PA; *Microsphaera diffusa*, OH, PA, UT; *Sphaerotheca pannosa*, ID, WA.

RUST. *Puccinia tumidipes* (II, III), NY to AL, SD, TX; *P. globosipes* (II, III), PA.

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### Maurandya

LEAF SPOT. *Septoria antirrhinorum*, TX.

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### Mauritius-Hemp (*Furcraea*)

NEMATODE, Root Knot. *Meloidogyne* sp., MD.

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### May-Apple (*Podophyllum*)

BLIGHT, Gray Mold. *Botrytis cinerea*, NJ.

BLIGHT, Leaf. *Septotinia podophyllina*, DE, MD, MO, NJ, NY, VA, WV.

LEAF SPOT. *Cercospora podophylli*, IL; *Glomerella cingulata*, DE; *Pezizella oenotherae*, VA; *Phyllosticta podophylli*, NY to AL, AR, WI; *Vermicularia podophylli*, TX, VA.

ROT, Stem. *Rhizoctonia* sp., MO.

RUST. *Puccinia podophylli*, general.

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### Meadow-Beauty (*Rhexia*)

LEAF SPOT. *Cercospora erythrogena*, AL, DE, MS, TN; *Colletotrichum rhexiae*, DE; *Phyllosticta rhexiae*, FL.

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### Meadow-Rue (*Thalictrum*)

DOWNY MILDEW. *Phytophthora thalictri*, CT, NY, WI.

LEAF SPOT. *Ascochyta clematidina* f. sp. *thalictri*, WI; *Cercospora fingens*, IL, WI; *Cercosporella filiformis*, WI; *Cylindrosporium thalictri*, IN, KS, WI; *Gloeosporium thalictri*, WI; *Mycosphaerella thalictri*, NJ, NY, VT, WI; *Septoria thalictri*, KS.

POWDERY MILDEW. *Erysiphe polygoni*, MA to PA, IL, ND.

RUST. *Puccinia recondita* (0, I), CO, MI, north-eastern and North central states; II, III on grasses; *P. septentrionalis* (0, I), CA, CO, IN, IA; II, III on *Polygonum*, *Tranzschelia pruni-spinosae* (0, I), CO, IN, IA, KS, NE, ND, OH, PA, SD; II, III on *Prunus*, *T. thalictri* (0, III), eastern and central states to CA, ID, MS, NM.

SMUT, Leaf and Stem. *Urocystis sorosporioides*, AZ, MA, NY, UT.

SMUT, White. *Entyloma thalictri*, CT, IL, IN, NY, WI.



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**Meadowsweet (*Filipendula*)**

LEAF SPOT. *Cylindrosporium* sp.; *Septoria ulmariae*, CT.

POWDERY MILDEW. *Sphaerotheca macularis*, IN, NY, VT.

RUST. *Triphragmium ulmariae* (0, I, II, III), IN.

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**Medicago (Black Medic)**

POWDERY MILDEW. *Oidium* sp., CA; *Erysiphe pisi* (on alfalfa), ID, OR.

ROT, ROOT. *Aphanomyces eutiches*, Race 2 (on alfalfa), IL; *Phoma sclerotioides*, WI.

RUST, Chickpea. *Uromyces ciceris-arietini*, CA.

VIRUS. *Tomato Ringspot*, VT.

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**Medlar (*Mespilus*)**

BACTERIAL Fire Blight. *Erwinia amylovora*, NY.

LEAF SPOT. *Fabraea maculata*, CA.

RUST. *Gymnosporangium clavipes*, NY.

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**Melampodium (*Melampodium divaricatum*)**

POWDERY MILDEW. *Oidium* sp., LA.

VIRUS. *Tomato Spotted Wilt*, LA.

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**Melaleuca**

RUST. *Puccinia psidii*, CA, FL; *Uromyces striatus* (on sweetclover), KS.

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**Melilotus**

BROOMRAPE. *Orobanche ramosa*, TX.

POWDERY MILDEW. *Oidium* sp., KS.

VIRUS. *Sweet Clover Latent*, IL.

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**Melon, Muskmelon, Cantaloupe, Cassabra (*Cucumis melo*)**

ANTHRACNOSE. *Colletotrichum lagenarium*, general in East and South to AZ, CO, ND; *Marssonina melonis*, NY.

BACTERIAL Angular Leaf Spot. *Pseudomonas lachrymans*, CA, DE, IA, MD, MI, NJ, PA; *P. pseudoalcaligenes* subsp. *citrulli*, GA.

BACTERIAL Fruit Blotch. *Acidovorax avenae* (syn. *Pseudomonas pseudoalcaligenes* subsp. *citrulli*), TX.

BACTERIAL Rind Necrosis. *Erwinia* sp., GA, TX.

BACTERIAL Soft Rot. *Erwinia aroideae* and *E. carotovora*.

BACTERIAL Wilt. *Erwinia tracheiphila*, general east of Rocky Mts.; AZ to ID, WA.

BLIGHT, Gummy Stem; Black Rot. *Mycosphaerella citrullina* (*M. melonis*), DE, FL, MA, NJ, NY, TX.

BLIGHT, Leaf; Black Mold. *Alternaria cucumerina*, general.

BLIGHT, Southern. *Sclerotium rolfsii*, VA and OH to FL, TX.

BLIGHT, Stem Gumming and Stem-End Rot. *Diplodia natalensis*, TX.

DAMPING-OFF. *Rhizoctonia solani*, CA, GA, NJ; fruit rot, FL, TX; *Pythium debaryanum*, CA, CT, IA, NJ, NY; *Fusarium equiseti*, CA.

DECAY, Postharvest. *Epicoccum nigrum*, OK.

DODDER. *Cuscuta arvensis*, MD.

DOWNY MILDEW. *Pseudoperonospora cubensis*, general.

LEAF SPOT. *Cercospora* sp., CO, GA, TX; *Phyllosticta* sp., GA, OH, TX; *Septoria cucurbitacearum*, DE, MA, MI, NH, NY, PA, VT, WI; *Alternaria alternate* f. sp. *cucurbitae*, MD, Mid-Atlantic, U.S.

LEAF SPOT, STEM NECROSIS, MELON NECROTIC SPOT VIRUS, Mexico, Guatemala, Honduras, Panama, and Uruguay.

NEMATODE, Root Knot. *Meloidogyne arenaria*, *M. hapla*, NJ to FL, CA.

NONPARASITIC. *Leaf Spot*. Magnesium deficiency, NY.

POWDERY MILDEW. **Golovinomyces cichoracearum**, general.

ROT, Charcoal. **Macrophomina phaseoli**, CA, OR, TX.

ROT, Corky Dry. **Fusarium semitectum**, FL.

ROT, Fruit. **Fusarium** spp., general in market, also **Alternaria** spp.; **Monilia sitophila**, IN, NY; **Mucor** sp., NY; **Penicillium** spp., blue mold; **Phytophthora** spp.; **Rhizopus stolonifer**, cosmopolitan; **Trichoderma viride**, green mold; **Trichothecium roseum**, pink mold, occasional in market.

ROT, Root. **Monosporascus cannonballus** and **Acremonium** sp., CA; **Phymatotrichum omnivorum**, TX; **Pythium periplocum**, CA.

ROT, Root; Cottony Leak. **Pythium aphanidermatum**, AZ, CA, TX.

ROT, Stem. **Sclerotinia sclerotiorum**, AR, MA, TX; **Cephalosporium** sp.

SCAB. **Cladosporium cucumerinum**, occasional, East and central states.

VIRUS. **Beet Curly Top**, AZ, CA, ID, OR, TX, WA; **Cucumber Mosaic**, general; **Muskmelon Mosaic**, general; **Tobacco Ring Spot**, KS, MD, NC, PA, WI; **Squash Mosaic**; **Watermelon Mosaic**; **Zucchini Yellow Mosaic**, CA, FL, NY; **Lettuce Infectious Yellows**, AZ, CA, TX; **Muskmelon Vein Necrosis**, CA; **Melon Necrotic Spot**; **Melon Leaf Curl**, CA; **Papaya Ring Spot**, LA; **Watermelon Mosaic**, LA; **Cucurbit Leaf Curl**, AZ, TX; **Cucurbit Yellow Stunting**, AZ, TX, Mexico; **Melon Severe Mosaic**, Mexico, State of Guerrero; **Potyvirus**, CA.

WILT. **Fusarium oxysporum** f. sp. *melonis*, general Race 1 Colima, Mexico; **Verticillium alboatrum**, CA, OR.

Melons belong to the cucurbit family and in general have the same diseases as cucumbers. Downy mildew is a problem on the moist East Coast, and powdery mildew may be a limiting factor in the arid Southwest. Although there are varieties resistant to powdery mildew, different physiological races of the fungus keep things complicated. Sulfur dust should not be used except on sulfur-resistant melon varieties. Mosaic is transmitted both by seed and aphids; purchase virus-free seed, eliminate weeds, and keep down insects.

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## Melothria

DOWNY MILDEW. **Pseudoperonospora cubensis**, GA, OH, TX.

NEMATODE, Root Knot. **Meloidogyne** sp., FL.

POWDERY MILDEW. **Golovinomyces cichoracearum**, WI.

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## Mentzelia (Blazing Star)

LEAF SPOT. **Phyllosticta mentzeliae**, KS, TX; **Septoria mentzeliae**, KS, TX, WA.

ROT, Root. **Phymatotrichum omnivorum**, TX; **Rhizoctonia solani**, NJ.

RUST. **Puccinia aristidae** (0, I), AZ, CO; II, III on grasses; **Uredo floridana**, FL.

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## Menziesia

GALL, Leaf. **Exobasidium vaccinii**, Pacific Northwest, AL, NC, VA, WV.

LEAF SPOT, Tar. **Melasmia menziesii**, MT, and WY to AK, OR; **Rhytisma** sp.

POWDERY MILDEW. **Microsphaera alni** var. *vaccinii*, AK, VA.

RUST. **Pucciniastrum myrtilli** (II, III), WV; 0, I on hemlock.

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## Mertensia (Bluebells, Virginia Cowslip)

DOWNY MILDEW. **Peronospora** sp., MT.

LEAF SPOT. **Septoria poseyi**, OR.

POWDERY MILDEW. **Golovinomyces cichoracearum**, AL, CO, MT, PA, NV, NM, UT, WY.

ROT, Stem. **Sclerotinia sclerotiorum**, CO.

RUST. **Puccinia mertensiae** (III), CO, NV, UT, WY; **P. recondita** (0, I), ID, MT, OR; II, III on grasses.

SMUT, Leaf. **Entyloma serotinum**, IN, IA, MD, VA, WY.

VIRUS. **Cucumber Mosaic**, IL, NJ.

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**Mesembryanthemum (Fig-Marigold)**

NEMATODE, Root Knot. *Meloidogyne* sp., AL, TX.  
SOOTY MOLD. *Torula herbarum*, CA.

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**Mesquite (*Prosopis*)**

BACTERIAL Crown Gall. *Agrobacterium tumefaciens*, TX.

BLIGHT, Leaf. *Cercospora prosopidis*; *Scleropycnium aureum*, AZ, TX.

LEAF SPOT. *Napicladium prosopodium*, TX; *Phyllosticta juliflora*, also pod spot, OK, TX; *Gloeosporium leguminum*, pod spot, TX.

MISTLETOE. *Phoradendron californicum*; *P. serotinum* (*flavescens*), TX to CA, and *P. tomentosum*, TX.

POWDERY MILDEW. *Leveillula taurica*; *Oidiopsis taurica*; *Uncinula prosopidis*, TX.

ROT, Heart. *Polyporus texanus*, CA, TX; *Fomes everhartii*, AZ, TX; *Schizophyllum commune*, TX; *Hypoxylon diatrypeoides* (die-back, trunk rot), Mexico.

ROT, Root. *Phymatotrichum omnivorum*, TX.

RUST. *Ravenelia arizonica* (II, III), TX to CA; *R. holwayi* (0, I, II, III), TX to CA.

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**Mignonette (*Reseda*)**

DAMPING-OFF, Root Rot. *Rhizoctonia solani*, CT.  
LEAF SPOT. *Cercospora resedae*, MA to MS, IA, MO.

NEMATODE, Root Knot. *Meloidogyne* sp., FL.

WILT. *Verticillium albo-atrum*, NY.

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**Milk Thistle (*Silybum*)**

VIRUS. Tobacco Streak, CA.

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**Mikania (Climbing Hempweed)**

LEAF SPOT. *Cercospora mikaniae*, MS; *Septoria mikanii*, CT, TX.

RUST. *Puccinia spegazzinii*, AL, FL, MS, NC.

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**Milkwort (*Polygala*)**

ANTHRACNOSE. *Gloeosporium ramosum*, IN, NJ, WI.

LEAF SPOT. *Cercospora grisea*, MS, NJ, VA; *Septoria consocia*, IN, MI; *S. polygalae*, NY.

RUST. *Aecidium renatum*, NM; *Puccinia andropogonis* var. *polygalina* (0, I), IA, MI, WI; II, III on *Andropogon*; *P. pyrolae* (III), CT, ME, MI, NH, NY, WI.

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**Mimosa, Silk-Tree (*Albizzia julibrissin*)**

CANKER; DIEBACK. *Nectria cinnabarina*, DC, NC, VA.

NEMATODE, Root Knot. *Meloidogyne arenaria* var. *thamesii*; *M. incognita*; *M. javanica*; *M. hapla*.

NEMATODE, Stubby Root. *Trichodorus primitivus*.

ROT, Heart. *Ganoderma lucidum*; Root, *Armillaria mellea*.

VIRUS. Mimosa Striped Chlorosis, AR.

WILT. *Fusarium oxysporum* f. sp. *perniciosum*, AL, AR, CA, GA, FL, MS, NJ, NC, SC, VA.

The mimosa wilt is one of the most devastating tree disease on record. The fungus is in the soil with no possibility of control by aerial spraying. The incidence of wilting is probably increased by nematodes. Resistant varieties Tryon and Charlotte have been released, but occasional specimens succumb to wilt. The fungus may also be seed-transmitted.

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**Mimulus (Monkey-Flower)**

BACTERIAL, MLO. California Aster Yellows, CA.

BLIGHT, Gray Mold. *Botrytis cinerea*, AK.

LEAF SPOT. *Cercospora mimuli*, MO; *Ramularia mimuli*, CA, NY, OH, WY; *Septoria mimuli*, PA to MS, MO, NE.

NEMATODE, Leaf. *Aphelenchoides ritzemabosi*.

POWDERY MILDEW. **Golovinomyces cichoracearum**, CA, PA, UT.  
 RUST. **Puccinia andropogonis** (0, I), MO, WI; II, III on *Andropogon*; **Uredo** sp. (II), WI.

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### Mint (*Mentha*)

ANTHRACNOSE. **Colletotrichum coccodes**, WA, WI.  
 CANKER, Stem. **Fusarium** sp., MI, WA;  
**Alternaria** sp., MI; **Phoma menthae**, OR.

LEAF SPOT. **Cercospora menthicola**, IL, TX;  
**Phyllosticta decidua**, occasional, ME to OH, IA, WI; **Ramularia menthicola**, CA, ME, MT, OR; **Septoria menthae** (*S. menthicola*), IN, WI.

NEMATODE. **Aphelenchoides parietinus**; **Paralongidorus sylphus**, OR; **Paratylenchus macrophallus**, OR.

NEMATODE, Root Knot. **Meloidogyne hapla**, OR.

POWDERY MILDEW. **Golovinomyces cichoracearum**, CO, IA, UT, WA; **Erysiphe galeopsidis**, IA; **Erysiphe orontii**, CA; **Erysiphe polygoni**, TX; **Sphaerotheca macularis**, WA.

RUST. **Puccinia menthae** (0, I, II, III), East and central states to TX and Pacific Coast, FL; **P. angustata** (0, I), CA, SD, WI; II, III on grasses.

SPOT ANTHRACNOSE. **Sphaceloma menthae**, IN, MD, MI.

VIRUS. **Tobacco Ring Spot**, IN, OR; **Tomato Spotted Wilt**, OR; **Strawberry Latent Ringspot**, OR; **Mint Crinkle**; **Alfalfa Mosaic**; **Mint Vein Bending**, **Arabis Mosaic**, **Mint Virus** (1), (2), and (X), **Cherry Raspberry Leaf**, **Peppermint Latent**, **Cucumber Mosaic**, **Peppermint Stunt**, **Impatiens Necrotic Spot**, **Lychnis Ringspot**, **Tomato Aspermy**, OR.

WILT. **Verticillium albo-atrum** f. sp. *menthae* (*V. dahliae*), IN, MI, OR.

Rust is serious in mints grown commercially, in greenhouses or in the field. Overwintering spores can be killed by treating rhizomes with hot water. Spot anthracnose is largely controlled by thorough coverage when mint is plowed under in the fall. Mint in the backyard is too prolific for worry about disease.

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### Mistletoe (*Phoradendron*)

BLACK MILDEW. **Asterina phoradendricola**, FL.  
 BLIGHT, Brown Felt. **Herpotrichia juniperi**, CA.  
 BLIGHT, Leaf. **Sphaeropsis visci**, SC, TX;  
**Phyllosticta phorodendri**, CA.

BLIGHT, Twig. **Nectria cinnabarina**, TX.

CANKER. **Cystospora pinicola**, OR, WA;  
**Hymenochaete agglutinans**, AL.

CANKER, Felt Fungus. **Septobasidium pseudopedicellatum**, FL.

DODDER. **Cuscuta exaltata**, TX.

LEAF SPOT. **Cercospora struthanthi**, FL;  
**Exosporium phoradendri**, TX;  
**Phytophthora ramorum**, CA.

RUST. **Peridermium bethelii**, CO; **Uredo phoradendri**, CA, OR.

If you treasure mistletoe for Christmas greens, you will be sorry it has diseases; but if you consider mistletoe a pest, you'll wish the above list were longer.

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### Mistletoe, Dwarf (*Arceuthobium* spp.)

BLIGHT, Brown Felt. **Herpotrichia juniperi**, CA.

RUST. **Peridermium bethelii**, CO.

SPOT, SHOOT, LESION. **Colletotrichum gloeosporioides**.

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### Mock-Cucumber (*Echinocystis*)

ANTHRACNOSE. **Colletotrichum lagenarium**, FL.

DOWNY MILDEW. **Plasmopara australis**, IA, KS, MN, OH, WI; **Pseudoperonospora cubensis**, OH.

LEAF SPOT. **Cercospora echinocystis**, NY to FL, NE, WI; also fruit spot; **Septoria** spp., widespread; **Alternaria** sp., FL.

POWDERY MILDEW. **Golovinomyces cichoracearum**, WI.

VIRUS. **Beet Curly Top**, CA; **Cucumber Mosaic**, CA, CO, IL, IN, MI, NY, WI.

WILT. **Fusarium** sp., FL.

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**Mock-Orange (*Philadelphus*)**

BACTERIAL Blight. *Pseudomonas syringae*, MN.

BLIGHT, Flower and Shoot. *Botrytis cinerea*, cosmopolitan.

BLOTCH, Sooty, *Sarcinella heterospora*, FL.

LEAF SPOT. *Ascochyta philadelphi*, NY; *Cercospora angulata*, MO, TX; *Ramularia philadelphi*, TX, WA; *Septoria philadelphi*, ID, IA, MT.

NEMATODE, Root Knot. *Meloidogyne* sp.

POWDERY MILDEW. *Phyllactinia corylea*, GA, MT, WA.

ROT, Root. *Phymatotrichum omnivorum*, TX.

RUST. *Gymnosporangium speciosum* (0, I), CO, NM, UT; III on juniper.

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**Mock-Strawberry (*Duchesnea*)**

DOWNY MILDEW. *Peronospora potentillae*, NC.

GALL, Leaf. *Synchytrium globosum*, SC.

LEAF SPOT. *Pezizella oenotherae*, VA.

RUST. *Frommeella duchesneae* (0, I, II, III), NH to FL, KY; *Frommeella duchesneae*, IN.

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**Monarda (Horse-Mint, Bee-Balm)**

BLIGHT, Southern. *Sclerotium rolfsii*, TX.

GALL, Leaf. *Synchytrium holwayi*, IA, WI.

LEAF SPOT. *Cercospora* sp., OK; *Phyllosticta decidua*, KS, NE, OK, TX, WI; *P. monardae*, KS; *Ramularia brevipes*, AL, TX.

POWDERY MILDEW. *Golovinomyces cichoracearum*, general.

RUST. *Puccinia angustata* (0, I), NE, WI; *P. menthae* (0, I, II, III), general from ME to MS. ID, TX, *P. monardae*.

VIRUS. Mosaic. Unidentified, IN; Tomato Spotted Wilt, PA.

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**Monardella**

LEAF SPOT. *Phyllosticta monardellae*, CA.

RUST. *Puccinia menthae* (0, I, II, III), CA, NV, NM, OR, UT.

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**Moneses (Wood-Nymph)**

RUST. *Chrysomyxa pirolata* (II, III). AK, CO, ME, MI, MT, NM, WA, WY; 0, I on spruce.

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**Monkshood, Aconite (*Aconitum*)**

BACTERIAL Leaf Spot. *Pseudomonas delphinii*, ME, NJ.

DOWNY MILDEW. *Plasmopora pygmaea*, AK.

NEMATODE, Root Knot. *Meloidogyne* sp., NY, VT.

POWDERY MILDEW. *Erysiphe polygoni*, NY, TX, WV.

ROT, Root. *Phymatotrichum omnivorum*, TX; *Rhizoctonia solani*, CT, NJ.

ROT, Stem. *Sclerotinia sclerotiorum*, CO; *Sclerotium rolfsii*, CT, DE, MN, NJ, NY.

RUST. *Puccinia recondita* (0, I), CO, AK; II, III on grasses; *Uromyces lycocconi* (0, I, II, III), CA, CO, TX, UT, WY.

SMUT, Leaf and Stem. *Urocystis carcinodes*, UT; *U. sorosporioides*, UT.

VIRUS. Mosaic, Unidentified, NY.

WILT, *Verticillium albo-atrum*, MA, NJ, NY, OH.

*Verticillium* wilt is doubtless more widespread in monkshood than the official reports indicate. The leaves dry along the stem, flowers are poor, and when the stem is cut across, blackened bundles are readily seen. The clumps do not die immediately but decline over a period of years.

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**Monkshood Vine (*Ampelopsis aconitifolia*)**

DIEBACK. *Tubercularia nigricans*, NH, TX.

NEMATODE, Dagger. *Xiphinema index*.

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## Monstera

ANTHRACNOSE. *Gloeosporium* sp., WA;  
*Colletotrichum* sp.  
 LEAF SPOT. *Macrophoma philodendri*, FL, MI.

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## Montia (Indian Lettuce)

SMUT, Seed. *Ustilago claytoniae*, WA.

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## Moonflower (*Calonyction*)

LEAF SPOT. *Phyllosticta* sp., NJ.  
 NEMATODE, Leaf. *Aphelenchoides fragariae*, NJ.  
 NEMATODE, Root Knot. *Meloidogyne* sp., NJ, SC.  
 ROT, Root. *Phymatotrichum omnivorum*, TX.  
 RUST. *Coleosporium ipomoeae* (II, III), AL, NC,  
 SC, TX; 0, I on pine.  
 WHITE RUST. *Albugo ipomoeae-panduratae*,  
 FL.

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## Moonseed (*Menispermum*)

LEAF SPOT. *Cercospora menispermii*, NY to VA,  
 KS, WI; *Colletotrichum sordidum*, WI;  
*Phyllosticta menispermicola*, IL; *Septoria*  
*abortiva*, IL, KS.  
 POWDERY MILDEW. *Microsphaera alni*,  
 widespread.  
 SMUT, Leaf. *Entyloma menispermii*, PA to VA,  
 KS, ND.

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## Morea

RUST. *Puccinia iridis*, FL.

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## Morinda (Royoc, Indian-Mulberry)

LEAF SPOT. *Cercospora morindicola*, FL.  
 SPOT ANTHRACNOSE. *Sphaceloma morindae*.

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## Morning-Glory (*Ipomoea*)

BLIGHT. *Phytophthora ipomoeae*, Mexico  
 (Meteppec).  
 BLIGHT, Blossom, Blight. *Choanephora*  
*compacta*, GA.  
 BLIGHT, Southern. *Sclerotium rolfsii*, TX.  
 BLIGHT, Thread. *Pellicularia koleroga*, FL.  
 CANKER, Stem. *Vermicularia ipomoeorum*, NY,  
 PA; *Diaporthe phaseolorum* var. *cauliflora*,  
 LA.  
 CHLOROTIC LEAF DISTORTION. *Fusarium*  
*lateritium*, NC.  
 LEAF SPOT. *Alternaria* sp., VA; *Cercospora*  
*alabamensis*, AL, FL, NJ; *Phyllosticta*  
*ipomoeae*, FL, KS, MS; *Septoria convolvuli*,  
 FL, KS, PA, TX, WI.  
 NEMATODE, Root Knot. *Meloidogyne* sp.;  
*M. hapla*, AL, OK; *M. incognita*, LA.  
 NEMATODE. *Rotylenchulus reniformis*, LA.  
 ROT, Root. *Erwinia carotovora* subsp.  
*carotovora*, LA; *Phymatotrichum*  
*omnivorum*, TX; *Macrophomina*  
*phaseolina*, AZ; *Streptomyces ipomoea*,  
 LA; *Ceratocystis fimbriata*, LA; *Fusarium*  
*oxysporum* f. sp. *batatas*, LA; *Plenodomus*  
*destruens*, LA; *Monilochaetes infuscans*,  
 LA.  
 RUST. *Puccinia crassipes* (I, III), FL, GA,  
 LA, SC; *Coleosporium ipomoeae* (II, III),  
 NJ to FL, KS, TX; 0, I on pine; *Uredo*  
*laeticolor* (II), FL.  
 VIRUS. *Cucumber Mosaic*, FL; *Sweet Potato*;  
*Tomato Spotted Wilt – Impatiens Serotype*  
 and *Lettuce Serotype*, FL; *Sweetpotato*  
*Feathery Mottle*.  
 WHITE RUST. *Albugo ipomoeae-panduratae*, NJ  
 to AZ, NE.  
 WILT. *Fusarium* sp., TX.

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## Moss Rose (*Portulaca grandiflora*)

VIRUS. *Alternanthera Mosaic*, FL, MD, PA.

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**Motherwort (*Leonurus*)**

BLACK MILDEW. *Dimerosporium hispidulum*, TX.

LEAF SPOT. *Ascochyta leonuri*, LA; *Phyllosticta decidua*, OH, TX, WI; *Septoria lamii*, PA.

VIRUS. *Mosaic*. Unidentified, IN.

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**Mountain-Ash (*Sorbus*)**

BACTERIAL Crown Gall. *Agrobacterium tumefaciens*, CT, NJ.

BACTERIAL Fire Blight. *Erwinia amylovora*, widespread, VA.

BLIGHT, Leaf. *Fabraea maculata*, AK, MN, WV, WI.

BLIGHT, Twig. *Nectria cinnabarina*, corla spot, AK, NC; *Phomopsis* sp., MA; *Valsa leucostoma*, OH, WV.

CANKER. *Cytospora* sp., VA.

CANKER, Blister. *Nummularia discreta*, IA, MA.

CANKER, Branch; Fruit Rot. *Glomerella cingulata*, IN.

CANKER; DIEBACK. *Cytospora chrysosperma*, MN, MT, NE, NJ, WA *C. leucostoma*, MT; *C. massariana*, ID; *C. microspora*, MT; *Fusicoccum* sp., IL.

CANKER, Trunk; Black Rot. *Cytospora rubescens*, IA; *Physalospora obtusa*, IN, MI, OH, CT to VA.

LEAF SPOT. *Alternaria* sp., IA; *Graphium sorbi*, NY, WI; *Phyllosticta globigera*, ID, WA; *P. sorbi*, IL, IA, ME, MO, OK, TX; *Septoria sorbi*, IA; *S. sitchensis*, ID.

MISTLETOE, European. *Viscum album*, CA.

POWDERY MILDEW. *Podosphaera oxyacanthae* var. *tridactyla*, WA.

ROT, Heart. *Polyporus hirsutus*, MI, WA; *P. versicolor*, WI.

ROT, Root. *Armillaria mellea*, NJ; *Phymatotrichum omnivorum*, TX.

RUST. *Gymnosporangium cornutum* (0, I), ME to NJ, WI, MT to CO, AK, WA; III on juniper; *G. globosum* (0, I), OR; III on *Libocedrus*;

*G. nelsonii* (0, I), MT, WA, WY; III on juniper; *G. nootkatense* (0, I), AK, OR, WA; III on *Chamaecyparis*; *G. tremelloides* (0, I), MT to CO, AK, WA.

SCAB. *Venturia inaequalis*, IL, MN, NY, WA.

Mountain-ash is quite susceptible to fire blight, but affected branches can usually be pruned out. Rust may appear on foliage in mid-summer. If the mountain-ash is more desirable than the junipers nearby, the latter can be eradicated. Fertilizing will help the tree recover from a bout with *Cytospora* canker but may increase susceptibility to fire blight.

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**Mountain-Heather (*Phyllodoce*)**

BLIGHT, Brown Felt. *Herpotrichia nigra*, ID.

GALL, Leaf. *Exobasidium vaccinii-uliginosi*, OR.

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**Mountain-Holly (*Nemopanthus*)**

LEAF SPOT. *Ramularia nemopanthus*, NY.

LEAF SPOT, Tar. *Rhytisma ilicis-canadensis*, ME to WV, MI.

POWDERY MILDEW. *Microsphaera alni*, NY, WI. ROT, Wood. *Poria inermis*, PA.

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**Mountain-Laurel (*Kalmia*)**

BACTERIAL LEAF SPOT. *Pseudomonas syringae*, OR.

BLIGHT, Flower. *Ovulinia azaleae*, AL, SC, AL.

BLIGHT, Leaf. *Phomopsis kalmiae*, NY to NC.

BLIGHT, Necrotic Shoots and Leaves. *Phytophthora irrigate* and *P. hydropathica*, MD, PA, VA, WV.

CANKER; Felt Fungus. *Septobasidium* sp., AL, TX.

GALL, Leaf. *Exobasidium vaccinii*, AK; *Synchytrium vaccinii*, red spot, NJ.

HEART, Rot, Wood Rot. *Fomes annosus*, NC.

LEAF SPOT. *Cercospora kalmiae*, CT to AL, TN; *Mycosphaerella colorata* (*Phyllosticta*

*kalmicola*), CT to AL, IN, MI, TX; **Pestalotia kalmicola**, secondary, DE, NJ, PA, TX, WA; **Septoria angustifolia**, MA to AL, OH; **Rhytisma andromedae**, tar spot, VT.

NONPARASITIC. **Chlorosis**. Usually iron deficiency.

POWDERY MILDEW. **Microsphaera alni** var. **vaccinii**, WI.

ROT, Root. **Armillaria mellea**, MD; **Corticium galactinum**, MD; **Phymatotrichum omnivorum**, TX; **Phytophthora lateralis**, NC; **P. cinnamomi**, VA; **P. palmivora**, VA.

ROT, Wood. **Polyporus versicolor**, VA; **Stereum rameale**, VA.

VIRUS. **Rhododendron Necrotic Ringspot**, OR.

Phomopsis leaf blight or blotch and Mycosphaerella (Phyllosticta) leaf spot are common and rather disfiguring on bushes in shade or under tree drip. In light cases, removal of spotted leaves is sufficient.

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### Mountain-Mahogany (*Cercocarpus*)

LEAF SPOT. **Septogloeum cercocarpi**, CA.

ROT, Wood. **Stereum hirsutum**, OR.

SPOT ANTHRACNOSE. **Sphaceloma cercocarpi**, CA.

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### Mountain-Mint (*Pycnanthemum*)

GALL, Leaf. **Synchytrium cellulare**, WI.

LEAF SPOT. **Cercoseptoria blephiliae**, WI; **Cercospora pycnanthemi**, AL.

RUST. **Puccinia angustata** (0, I), IN; **P. menthae** (0, I, II, III), MA to VA, AL, CA, IA, OK, TX.

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### Mountain-Sorrel (*Oxyria*)

RUST. **Puccinia oxyriae** (II, III), AK, CA, CO, ID, OR, UT; O, I unknown.

SMUT, Floral. **Ustilago vinosa**, AK, CA, CO, WA, WY.

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### Mulberry (*Morus*)

BACTERIAL Hairy Root. **Agrobacterium rhizogenes**, NE.

BACTERIAL Leaf Spot. **Pseudomonas syringae** pv. **mori**, general.

BACTERIAL Scorch. **Xylem limiting bacteria**, Mid-Atlantic and Southern U.S; **Xylella fastidiosa**, CA.

BLIGHT, Berry; Popcorn Disease. **Ciboria carunculoides**, NC to FL, TX, VA.

BLIGHT, Twig. **Myxosporium diedickei**, TX, WA.

CANKER; Twig Blight. **Cytospora** sp., NJ, TX; **Dothiorella** sp.; **D. mori**, NJ, TX; **Gibberella baccata** var. **mori**, widespread; **Nectria** sp., widespread; **N. cinnabarina**, wide spread; **Sclerotinia** sp., TX.

LEAF SPOT. **Cercospora moricola**, PA to FL, NE, TX; **Cercospora mori**, NE, OK, TX; **Exosporium** sp., FL; **Mycosphaerella arachnoidea**, false mildew, GA, NC; **M. mori**, widespread; **Phyllosticta moricola**, KS; **Cytospora** sp., VA.

NEMATODE, Root Knot. **Meloidogyne** spp., NJ, NC, OK.

POWDERY MILDEW. **Phyllactinia corylea**, OH; **Uncinula geniculata**, NY to KS, AL.

ROT, Heart. **Polyporus farlowii**, AZ, NM; **P. hispidus**, CT; **Ganoderma applanatum**; **Hymenochaete agglutinans**, MD.

ROT, Root. **Armillaria mellea**, DE, NC, OK; **Helicobasidium purpureum**, TX; **Phymatotrichum omnivorum**, TX.

ROT, Wood. **Schizophyllum commune**, CA; **Stereum cinerescens**, MA.

RUST. **Cerotelium fici** (II), LA.

Bacterial leaf spot damages nursery trees having overhead irrigation; Mycosphaerella leaf spot sometimes defoliates older trees.

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### Mullein (*Verbascum*)

DOWNY MILDEW. **Peronospora sordida**, NJ.

LEAF SPOT. **Cercospora verbasicola**, TX; **Phyllosticta verbasicola**, IN, KS, TX;



**Ramularia variabilis**, NY to MS, TX, WA;  
**Septoria verbasicola**, TX, NY to AL, MO,  
TX.

NEMATODE, Root Knot. **Meloidogyne** sp.

POWDERY MILDEW. **Golovinomyces**  
**cichoracearum**, PA; **Oidium** sp., NJ.

ROT, Root, **Phymatotrichum omnivorum**, TX.

VIRUS. **Tomato Ringspot**, VT.

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### Mushroom, Oyster (*Pleurotus ostreatus*)

DRY BUBBLE. **Verticillium fungicola**, PA.

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### Musk-Root (*Adoxa*)

GALL, Leaf. **Synchytrium anomalum**, IA.

LEAF SPOT. **Phyllosticta adoxae**, CO.

RUST. **Puccinia adoxae** (III), CO, UT, WY;

**P. argentata** (0, I), IA, MN, WI; II, III on  
*Impatiens*.

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### Mustard Greens (*Brassica juncea*)

BACTERIAL Black Rot. **Xanthomonas**  
**compestris**, FL, OH.

BACTERIAL, MLO. **Aster Yellows**.

BACTERIAL, Yellows. **Spiroplasma citri**, IL.

CLUB ROOT. **Plasmiodiophora brassicae**, CA,  
CT, OH, TX, WA.

DAMPING-OFF. **Rhizoctonia solani**,  
cosmopolitan.

DOWNY MILDEW. **Peronospora parasitica**, CT,  
FL, IA, TX.

LEAF SPOT. **Cercospora brassicola**, IN, LA,  
NJ; **Cercospora brassicae**, CA, VA;  
**Alternaria brassicae**, CA, black spot;  
**Pseudocercospora capsellae**, CA, white  
spot.

NEMATODE, Root Knot. **Meloidogyne** sp., FL,  
MO, TX; **Heterodera schachtii**, UT.

POWDERY MILDEW. **Erysiphe polygoni**, AZ, CA,  
FL, TX.

ROT, Crown; Drop. **Sclerotinia sclerotiorum**,  
TX.

ROT, Root; Damping-off. **Aphanomyces**  
**raphani**, WI.

RUST. **Puccinia aristidae** (0, I), CO; II, III on  
grasses.

VIRUS. **Cauliflower Mosaic**; **Turnip Mosaic**;  
**Tobacco Stread**, CA.

WILT. **Fusarium** sp.

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### Myrtle (*Myrtus*)

LEAF SPOT. **Pestalotia decolorata**, LA.

ROT, Root. **Cylindrocladium pauciramosum**, CA.

ROT, Stem. **Sclerotium rolfsii**, FL.

RUST, **Puccinia vincae**, CA.

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### Nandina

ANTHRACNOSE. **Glomerella cingulata**, TX.

LEAF SPOT. **Cercospora nandinae**, AL, SC.

NEMATODE, Root Knot. **Meloidogyne** sp.,  
NC, TX.

NONPARASITIC. **Chlorosis**. Alkaline soil, TX.

POWDERY MILDEW. **Microspheera berberidis**  
(**Erysiphe berberidis**), CA, Pacific  
Northwest.

ROT, Root. **Phymatotrichum omnivorum**, TX.

VIRUS. **Cucumber Mosaic**, MD, GA; **Nandina**  
**Mosaic**, CA; **Nandina Stem Pitting**, FL.

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### Narcissus (Daffodil, Jonquil)

BACTERIAL Streak; Stem rot. Unidentified, WA.

BLIGHT, Leaf; Fire. **Sclerotinia** (*Botrytis*)  
**polyblastis**, OR, WA; **Botrytis cinerea**;  
**Botryotinia polyblastis**, WA.

LEAF SCORCH. **Stagonospora curtisii**, general,  
especially in East and South.

LEAF SPOT, Blight; White Mold. **Ramularia**  
**vallisumbrosae**, OR, WA.

NEMATODE, Bulb. **Aphelenchoides fragariae**,  
FL, GA, NC, SC; **A. subtenuis**, Pacific  
Coast; **Aphelenchus avenae**, secondary.

NEMATODE, Bulb; Brown-ring Disease; Leaf  
"Spikkel". **Ditylenchus dipsaci**, in all com-  
mercial narcissus areas.

- NEMATODE, Lesion. **Pratylenchus pratensis**, OH, WA.
- ROT, Basal. **Fusarium oxysporum** f. sp. **narcissi**, general on hardy varieties.
- ROT, Black Bulb. **Sclerotinia sclerotiorum**; crown; wet scale, **Sclerotium rolfsii**, CA, FL, NY, VA.
- ROT, Large Scale Speck. **Stromatinia narcissi**, general in northern bulb areas.
- ROT, Leaf and Stem. **Gloeosporium** sp., LA, NC.
- ROT, Neck; Smoulder. **Sclerotinia narcissicola**, NJ, NY, OR, VA, WA; probably general except on polyanthus varieties.
- ROT, Root and Bulb. **Armillaria mellea**, CA, OR, WA; **Aspergillus** spp., black mold; **Penicillium** spp., blue mold, in wounds; **Trichoderma viride**, green mold in scales, cosmopolitan after sunscald; **Rhizopus stolonifer**, soft rot, cosmopolitan after sunscald; **Cylindrocarpon radicolata**, secondary root rot.
- ROT, Small Scale Speck; Neck Rot. **Sclerotium** sp., general, especially in southern bulb districts.
- VIRUS. **Narcissus Mosaic**, mild; **Narcissus Flower Streak**; **Narcissus Chocolate Spot**; **Narcissus Yellow Stripe**, **Gray Disease**, often called **Mosaic**, general; **White Streak**, general.
- Control of narcissus diseases rests with the grower, who should, and usually does, supply the gardener with sound, healthy bulbs. Inspect all bulbs carefully before planting, making sure there are no dark sclerotia on the scales or the chocolate brown of *Fusarium* rot at the base. The bulb and stem nematode is controlled by treating in hot water.
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- Nasturtium (*Tropaeolum*)**
- BACTERIAL Fasciation. **Clavibacter fascians**, CA.
- BACTERIAL Leaf Spot. **Pseudomonas syringae** pv. **aptata**, ME, MN, MS, NJ, PA, VA.
- BACTERIAL, MLO. **California Aster Yellows**, CA.
- BACTERIAL Wilt. **Pseudomonas solanacearum**, FL, MD, NJ, NC, VA.
- BLIGHT, Gray Mold. **Botrytis cinerea**, AK.
- DODDER. **Cuscuta** sp., MO, NH.
- LEAF SPOT. **Cercospora tropaeoli**, AL; **Heterosporium tropaeoli**, CA, NY; **Pleospora** sp., MS, NJ, OH.
- NEMATODE, Root Knot. **Meloidogyne** spp., NJ, TX; **Heterodera schachtii**, root gall.
- RUST. **Puccinia aristidae** (0, I), UT; II, III on grasses.
- VIRUS. **Beet Curly Top**, CA, TX; **Tomato Spotted Wilt**, CA, MD, TX.
- Compared with the almost inevitable affliction of black aphids, nasturtium diseases are insignificant.
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- Nectarine (*Prunus persica* var. *nectarina*)**
- BACTERIAL Canker. **Pseudomonas syringae**, CA.
- BACTERIAL Crown Gall. **Agrobacterium tumefaciens**, MO.
- BACTERIAL Leaf Spot; Canker. **Xanthomonas pruni**, OK.
- BACTERIAL, MLO. **Peach X-Disease**.
- CANKER. **Valsa leucostoma**, DC.
- LEAF CURL. **Taphrina deformans**, CA, OR, TX, WA.
- LEAF SPOT. **Cristulariella pyramidalis**, FL.
- LEAF SPOT; Shot Hole. **Coryneum carpophilum**, CA, OR, WA.
- NEMATODE, Lesion. **Pratylenchus thornei**, CA.
- NEMATODE, Root Knot. **Meloidogyne** sp., CA; usually resistant.
- POWDERY MILDEW. **Podosphaera oxycanthae**, ID, WA; **Sphaerotheca pannosa**, ID, NY, WA.
- ROT, Brown; Twig Blight. **Monilinia laxa**, CA, WA; **M. fructicola**, CT, NY, TX.
- ROT, Pink Mold. **Trichothecium roseum**, CA.
- ROT, Sour. **Geotrichum candidum**, CA; **Issatchenkia scutulata**, CA; **Kloeckera apiculata**, CA.
- SCAB. **Cladosporium carpophilum**, CT, DE, IL, NY, PA, TX.
- VIRUS. **Peach Mosaic**; **Peach Yellows**; **Peach Latent Mosaic Viroid**, WA; **Hop Stunt Viroid**, Ontario, Canada.

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## Nematanthus

LEAF SPOT. *Myrothecium roridum*, FL.

VIRUS. **Tobacco Mosaic**, CA, CT, DC, FL, OH, WA.

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## Nemesia

BACTERIAL, Proliferation. *Rhodococcus fascians*, OR.

VIRUS. Flower Break. *Angelonia angustifolia*, CA; **Hosta Virus X**, **Tobacco Rattle Virus**; **Helleborus Net Necrosis**; **Nemesia Ring Necrosis**, **Diascia Yellow Mottle**, Pacific Northwest.

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## Nemophila (Baby Blue-Eyes)

POWDERY MILDEW. *Golovinomyces cichoracearum*, CA, NV, TX, WA.

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## Nephtytis

LEAF SPOT. *Cephalosporium cinnamomeum*, FL, MD.

NEMATODE, Root Knot. *Meloidogyne incognita*.

ROT, Root. *Pythium splendens*, FL.

VIRUS. **Tomato Spotted Wilt**, PA.

Spraying with maneb should control the leaf spot.

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## Nerine (Guernsey-Lily)

LEAF SCORCH; Red Blotch. *Stagonospora curtisii*, CA.

NEMATODE, Lance. *Hoplolaimus coronatus*, NC.

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## Nettle (*Urtica, Ureca*)

NEMATODE, Soybean Cyst.

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## New Zealand Flax (*Phormium tenax*)

ROT, Root. *Armillaria mellea*, CA.

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## New Zealand Spinach (*Tetragonia*)

BACTERIAL, MLO. **Aster Yellows**, NJ, NY.

LEAF SPOT. *Cercospora tetragoniae*, IN, MA; *Helminthosporium* sp., TX.

NEMATODE, Root Knot. *Meloidogyne* sp., TX.

VIRUS. **Beet Curly Top**, CA; **Mosaic**, DE, and **Rosette**, IN, unidentified.

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## Nicotiana (Flowering Tobacco)

BACTERIAL Blackfire. *Pseudomonas tabaci*, WI; *P. angulata*, WI.

BLACK SHANK. *Phytophthora parasitica* var. *nicotianae*, CT.

BLIGHT. *Phytophthora infestans*, NY.

DAMPING-OFF, STEM LESIONS. *Rhizoctonia solani*, GA.

DOWNY MILDEW. *Peronospora tabacina*, CA, TX.

LEAF SPOT. *Alternaria longipes*, TX; *Rhizoctonia solani*, NC, New England; *Alternaria alternata*, CT, MA; *Thanatephorus cucumeris*, New England.

MOLD, Blue. *Peronospora tabacina*, GA.

NEMATODE, Root Knot. *Meloidogyne* sp., FL.

NEMATODE STUNT. *Globodera tabacum solanacearum*, VA, (also CT and Quebec, Canada on *Nicotiana tabacum*).

POWDERY MILDEW. *Oidium* sp., KY.

ROT, Root. *Phymatotrichum omnivorum*, TX; *Pythium myriotylum*, SC; in hydroponic; *Phytophthora nicotianae*, NC.

STEM NECROSIS. *Phytophthora nicotianae*, NC.

STUNT. *Glomus macrocarpum*, KY.

STUNT, Wilt. *Pythium dissotocum*, Brazil.

VIRUS. **Beet Curly Top**, TX; **Tomato Spotted Wilt**, CA, TN, TX, Mexico, Impatiens and Lettuce serotypes, GA; **Tobacco Mosaic**, GA; **Tobacco Ring Spot**; **Tobacco Vein-Mottling**, NC; **Cucumber Mosaic**, FL;

**Tobacco Mild Green Mosaic, Tobacco Vein-Banding Mosaic**, TN; **Tobacco Yellow Net**, CA; **Potato Leafroll**, Pacific Northwest, **Potato Virus A**, WA; **Blueberry Scorch**, British Columbia; **Rhynchosia Golden Mosaic**, Mexico; **Potato Virus Y**, GA; Southern Ontario, Canada.

WILT. *Pythium aphanidermatum*, NC.

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### Night-Blooming Cereus (*Hylocereus*)

VIRUS. **Cactus Virus X**, CA.

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### Nightshade, Silverleaf (*Solanum elaeagnifolium*)

Weed found in dry, open woods, prairie, waste places, and disturbed soil in Southwest, U.S.

BLIGHT, Late. *Phytophthora infestans*, NY.

NEMATODE, Foliar. *Nothanguina phyllobia*, TX.

VIRUS. **Tomato Spotted Wilt**, CA.

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### Nightshade, Hairy and Climbing (*Solanum sarrachoides*, *S. dulcamara*)

BLIGHT. *Phytophthora infestans*, ME, NY.

VIRUS. **Potato Leafroll**, Pacific Northwest.

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### Ninebark (*Physocarpus*)

LEAF SPOT. *Cercospora spiraea*, IN; *Marssonina neilliae*, CA, TX, WI; *M. ioniceriae*, OR; *Phyllosticta opulasteris*, ID; *Ramularia spiraeae*, MI, NY, WI.

POWDERY MILDEW. *Sphaerotheca macularis*, MA to WI.

ROT, Root. *Phymatotrichum omnivorum*, TX.

ROT, Wood. *Fomes conchatus*, NY.

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### Nothoscordum (False Garlic)

ANTHRACNOSE. *Colletotrichum circinans*, OK.

RUST. *Uromyces hordeinus* (0, I), KS, OK, TX; II, III on grasses; *U. primaverilis* (0, I, III), IL, MO, TX.

VIRUS. **Nothoscordum Mosaic**, LA.

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### Nutsedge (*Cyperus rotunders*) Grass-like

BLIGHT, Flower. **Balsania cyperi**, LA.

LEAF SPOT. *Dactylaria higginsii*, FL; *Sclerotinia minor*, NC.

NEMATODE, Cyst. *Heterodera mothi*, GA.

NEMATODE, Root-knot. *Meloidogyne graminicola*, GA.

ROT, Root. *Pythium arrhenomanes*, LA.

RUST. *Puccinia canaliculata*, GA.

VIRUS. **Impatiens Necrotic Spot Phytoplasma**, GA.

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### Nymphoides (Floating-Heart) Water Plants

RUST. *Puccinia scirpi* (0, I); II, III on *Scirpus*, FL.

SMUT, Leaf. *Burrillia decipiens*, NJ.

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### Oak (*Quercus*)

ANTHRACNOSE; Leaf and Twig Blight. *Gnomonia quercina* (*Gloeosporium quercinum*), general.

BACTERIAL Canker. Unidentified, IL.

BACTERIAL Crown Gall. *Agrobacterium tumefaciens*, MD, MI.

BACTERIAL Drippy Nut. *Erwinia quercina*, CA, on live oak.

BACTERIAL Leaf Scorch. *Xylella fastidiosa*, DC, FL, GA, KY.

BACTERIAL Wetwood. *Erwinia nimipressuralis*, VA.

BLACK MILDEW. *Morenoella quercina*, SC to FL, GA, TX; *Irenina manca*, MS.

BLIGHT, Sudden Oak Death. *Phytophthora ramorum*, (also branch canker) CA, OK.

BLIGHT, Twig. *Cryptocline cinerescens*, CA; *Diplodia longispora*, NY to NC, IL, WI; *D. quercina*, CA; *Discula quercina*, CA.

- CANKER, Bark. *Aleurodiscus oakesii*, NY to IL, CA, IA; *A. candidus*; *A. acerinus*; *A. griseo-canus*; *Dichaena quercina*, NJ.
- CANKER, Basal. *Cryphonectria parasitica*, PA.
- CANKER, Bleeding. *Phytophthora cactorum*, FL, MA, NY; *P. cinnamomi*, FL.
- CANKER, Branch. *Endothia gyrosa*, VA.
- CANKER, Branch; Decline; Dieback. *Botryodiplodia gallae*, MI; *Cephalosporium* sp.; *Hyalodendron* sp.
- CANKER, Bot. *Diplodia corticola*, CA.
- CANKER, Chestnut. *Endothia parasitica*, MS, SC, VA.
- CANKER, Felt Fungus. *Septobasidium* spp., NC to FL, LA.
- CANKER, Trunk. *Nectria galligena*; *Strumella coryneoides* (*Urnula craterium*); *Diplodia corticola*, CA.
- CANKER, Twig. *Cytospora chrysosperma*, NJ, RI; *Endothia parasitica*, occasional; *Dothiorella quercina*, MD, VA; *Fusarium solani*; *Physalospora glandicola*, MD; *P. obtusa*, MN, VA; *P. rhodina*, VA; *Pseudovalsa longipes*; *Pyrenochaete venuta*; *Coryneum japonicum*, FL.
- DECLINE. *Hypoxylon atropunctatum*, *H. punctulatum*, *H. mediterraneum*, VA; *Phytophthora quercina*, *P. cambivora*, MO.
- DODDER. *Cuscuta* spp., occasional in forest nurseries.
- LEAF BLISTER. *Taphrina caerulescens*, Northeast to North central and Gulf states; also CA, CO, GA, UT, WY.
- LEAF SPOT. *Actinopelte dryina*, occasional; *Acantharia echinata*, black, on live oak; *Cercospora macrochaeta*, CA; *Cylindrosporium microspilum*, *C. kelloggii*, CA; *Ciborinia (Sclerotinia) candolleana*; *C. hirtella*; *Dothiorella phomiformis*, widespread; *Gloeosporium septorioides*; *Marssonina martini*, general; *Leptothyrella californicum*, on live oak, CA; *Monochaetia desmazierii*, widespread; *Mycosphaerella* sp; *Phyllosticta* spp.; *Septogloeum defolians*, CA; *S. querceum*, WI; *Septoria* spp.; *Venturia orbicula*, NY to VA, OH.
- MISTLETOE. *Phoradendron serotinum (flavescens)*, NC to FL, TX; *P. villosum*, CA.; *P. tomentosum*, TX; *Psittacanthus macrantherus*, Sinaloa, Mexico.
- MOLD, Leaf. *Cladosporium brevipes*; *C. herbarum*.
- NEMATODE, Dagger. *Xiphinema americanum*, Southeast.
- NEMATODE, Ring. *Criconemoides annulatum*; *C. teres*; *Hemicriconemoides biformis*.
- NEMATODE, Root. *Hoplolaimus coronatus*; *Pratylenchus* sp.; *Meloidogyne* sp.
- NONPARASITIC Chlorosis. Iron deficiency, especially in pin oaks.
- PARASITIC LICHEN. *Strigula elegans* and *S. complanata*, Southern U.S., LA.
- POWDERY MILDEW. *Erysiphe trina*, witches' broom, on live oak, CA; *Microsphaera alni*, widespread; *Phyllactinia corylea*, widespread; *Sphaerotheca lanestris*, "brown mildew," serious on coast live oak, AL, CA, MS, NC; *Saccardia quercina*, AZ, GA.
- ROT, Heart. *Daedalea quercina*, widespread, other species; *Fistulina hepatica*; *Fomes* spp.; *Hericium erinaceous*; *Polyporus* spp.; *Stereum* spp.
- ROT, Heart. *Phlebia chrysocrea*, eastern U.S. (PA to FL) and WI to MS.
- ROT, Root. *Armillaria mellea*, widespread; *Clitocybe tabescens*, FL, MO, OK; *C. olearia*, CA; *Corticium galactinum* and other spp.; *Phytophthora cinnamomi*, of seedlings.
- ROT, Root and Collar. *Phytophthora cinnamomi*, CA.
- ROT, Wood. *Daldinia concentrica*; *D. vernicosa*; *Hypoxylon atropunctatum*; *Lentinus tigrinus*; *Linzites betulina* and other species; *Schizophyllum commune*; *Steccherinum ochraceum*.
- RUST. *Cronartium quercuum (C. cerebrum)* II, III, widespread; 0, I on pines; *C. fusiforme* (II, III), southern states; *C. strobilinum* (II), AR, FL, IL, IA, KS, MS, MO; 0, I on long-leaf pines; *C. conigenum* (II, III), AZ; 0, I on pine cones.
- RUST, Fusiform. *Cronartium fusiforme*, GA.
- SPOT ANTHRACNOSE. *Elsinoë quercus-falcatae*, on southern red oak, GA, NC; *E. quercicola*, FL.

VIRUS. **Oak Ringspot**, AR.

WILT, Dieback. **Fusarium oxysporum** or **F. solani**, VA; also canker; **Phytophthora europa** (also yellowing and dieback), North Central U.S., MN, OH, PA, WV, WI.

WILT, Oak. **Ceratocystis fagacearum** (*Chalara quercina*), AR, FL, IL, IN, IA, KS, KY, MD, MI, MN, MO, NE, NY, NC, OH, OK, PA, SC, TN, VA, WV, WI.

WITCHES' BROOM. **Articularia quercina** var. **minor**. AZ, NM, UT.

Oak wilt is our most serious disease with red and black oaks often dying the first season symptoms appear. Anthracnose is general, most severe on white oak, defoliating in wet seasons. Leaf blister, important in the South, can be prevented by a single dormant spray. Powdery mildew, due to *Sphaerotheca lanestris*, is important in California, where it produces witches' brooms on live oaks. The honey mushroom, *Armillaria mellea*, sometimes called the oak fungus, causes "shoestring" root rot. Strumella canker is frequent in forest trees, sometimes found in ornamentals.

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## Oat

VIRUS. **Oat Blue Dwarf**, upper Midwest, United States.

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## Ocotillo, Coach-Whip, Candlewood (*Fouquieria*)

ROT, Root. **Phymatotrichum omnivorum**, TX.

RUST. **Aecidium cannonii** (0, I), AZ.

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## Oenothera (Evening-Primrose)

BLIGHT, Gray Mold. **Botrytis cinerea**, AK.

DODDER. **Cuscuta arvensis**, OK.

DOWNY MILDEW. **Peronospora arthuri**, MA to MS, KS, MT, NE, OK, SD.

GALL, Leaf. **Synchytrium fulgens**, AL, KS, LA, MS, NC, OK, TX to CA.

LEAF SPOT. **Alternaria tenuis**, secondary, NJ; **Cercospora oenotherae**, AL, KS, TX, WV; **C. oenotherae-sinutae**, AL, NC; **Pezizella oenotherae**, GA, MD, NC, SD, VA; **Pestalotia oenotherae**, OH, OK; **Septoria oenotherae**, ME to FL, CA, NM, OK, SD, UT.

POWDERY MILDEW. **Erysiphe polygoni**, general.

ROT, Root. **Phymatotrichum omnivorum**, TX; **Rhizoctonia solani**, TX; **Sclerotinia minor**, NC.

RUST. **Aecidium anograe** (0, I), NE; **Puccinia aristidae** (0, I), AZ, NV; II, III on grasses; **P. dioicae** (0, I), ME to AL, CA, CO, ND, TX; II, III on *Carex*; **P. oenotherae** (0, I, II, III), CO, CA to MT, WA; **Uromyces plumbarius** (0, I, II, III), general.

VIRUS. **Mosaic**. Unidentified, PA.

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## Ohia (*Metrosideros* spp.); also *Eugenia*, *Syzygium* and *Psidium* spp. in Myrtaceae Family

RUST. **Puccinia psidii**, HI.

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## Okra (*Hibiscus esculentus*)

ANTHRACNOSE. **Colletotrichum gloeosporioides**, pod spot, FL, PA; **C. hibisci**, dieback, TX.

BLIGHT, Blossoms. **Choanephora cucurbitarum**, FL, GA, TX.

LEAF SPOT. **Ascochyta abelmoschi**, GA, MD, NJ, NY, pod spot; **Alternaria** sp., secondary, FL, OH, PA, SC, UT; **Cercospora abelmoschi** (*C. hibisci*), NC to FL, TX; **C. malayensis**, VA to FL, OK, TX; **Corynespora cassiicola**; **Phyllosticta hibiscina**, AL, IL, NJ, NC, OK.

NEMATODE, Root Knot. **Meloidogyne incognita**, general.

POWDERY MILDEW. **Golovinomyces cichoracearum**, CT, NJ, NC, PA.

ROT, Charcoal. **Macrophomina phaseoli**, TX.

ROT, Pod. **Botrytis** sp., NY.

ROT, Root. **Phymatotrichum omnivorum**, TX; **Rhizoctonia solani**, damping-off, AL, FL; **Thielaviopsis basicola**, NJ.

ROT, Stem. **Sclerotinia sclerotiorum**, MA.

VIRUS. **Tobacco Ring Spot**, GA, VA;  
**Yellow Mottle**, Mexico; **Yellow Mosaic Virus**, TX.

WILT. **Fusarium oxysporum** f. sp. *vasinfectum*, CT to FL, AZ, TX; **Verticillium albo-atrum**, widespread.

## Oleander (*Nerium*)

ANTHRACNOSE, Leaf Spot. **Gloeosporium** sp., MA, MS, NJ, TX.

BACTERIAL Knot. **Pseudomonas syringae** pv. **tonelliana**, AZ, CA, CT.

BACTERIAL, Leaf Scorch. **Xylella fastidiosa**, FL, Costa Rica.

BLIGHT, Stem and Leaf. **Pseudomonas syringae**, CA.

CANKER; Witches' Broom. **Sphaeropsis** sp., FL.

DODDER. **Cuscuta indecora**, FL.

LEAF SCORCH. **Xylella fastidiosa**, LA.

LEAF SPOT. **Alternaria** sp. (*Macrosporium nerii*), AL, CA, FL, GA, MS; **Cercospora neriella**, also pod spot, AL, FL, LA, TX; **Phyllosticta nerii**, FL, LA, MI, TX; **Septoria oleandrina**, CA, FL, LA.

ROT, Root. **Clitocybe tabescens**, FL; **Phymatotrichum omnivorum**, TX.

ROT, Stem. **Calonectria crotalariae**, CA.

SOOTY MOLD. **Capnodium elongatum**, AL, FL.

SPOT ANTHRACNOSE, Scab. **Sphaceloma oleandri**, LA.

## Olive (*Olea*)

ANTHRACNOSE. **Gloeosporium olivarum**, CA.

BACTERIAL Knot. **Pseudomonas syringae** pv. **savastanoi**, CA.

BLACK MILDEW; Leaf Spot. **Asternia oleina**, FL, GA.

DODDER. **Cuscuta indecora**, CA.

LEAF SPOT. **Cyclodolium oleaginum**, peacock spot, CA; **Cercospora caldosporioides**, also fruit spot, CA.

NEMATODE, Citrus. **Tylenchulus semipenetrans**.

NEMATODE, Lesion. **Pratylenchus musicola** (*P. coffeae*), CA.

NEMATODE, Root Knot. **Meloidogyne** sp., CA.

NONPARASITIC. **Bitter Pit** and **Dry Rot** of fruit. Overnutrition

**Exanthema**. Dieback. Deficiency of organic matter.

**Fruit Pit**. Boron deficiency.

**Soft Nose**. Blue Nose. Moisture supply. On variety Sevillano only.

ROT, Root. **Armillaria mellea**, CA, TX; **Phymatotrichum omnivorum**, TX; **Polyporus olaea**, CA; **Fusarium solani**, Argentina.

ROT, Root, Twig Wilt. **Phytophthora nicotianae**, Argentina.

VIRUS. **Sickle Leaf**.

WILT. **Verticillium albo-atrum**, CA.

## Oncoba

ROT, Root. **Phymatotrichum omnivorum**, TX.

## Onion (*Allium cepa*)

BACTERIAL, MLO. **Aster Yellows** and **California Aster Yellows**, widespread.

BACTERIAL Leaf Blight. **Xanthomonas campestris**, CA, FL, HI, TX; **X. axonopodis**, GA; **Pantoea ananatis**, CO.

BACTERIAL Rot; Slippery Skin. **Pseudomonas alliicola**, MA, NY, WA; **P. cepacia**, sour skin, scale rot, NY; **Enterobacter cloacae**, bulb decay, CO.

BACTERIAL Soft Rot. **Erwinia carotovora**, widespread in field, transit, storage.

BACTERIAL, Yellows. **Spiroplasma citri**, CA.

BLIGHT, Southern. **Sclerotium rolfsii**, AL, CA, GA, OK, TX.

BLOTCH, Purple, Brown. **Alternaria porri**, ME to MS, CO, TX, UT; **A. tennis**, CO; **A. tenuissima**, CO.

BULB DISEASE. **Pantoea ananatis**, NY.

DAMPING-OFF. **Pythium** spp., ID, MA, NY; **Rhizoctonia solani**, occasional.

- DECAY, Bulb; internal. **Enterobacter cloacae**, CA.
- DODDER. **Cuscuta** spp., widespread.
- DOWNY MILDEW. **Peronospora destructor**, general.
- LEAF BLIGHT; Bulb Rot. **Pantoea agglomerans**, GA.
- LEAF NECROSIS; Seedling Death. **Phytophthora nicotianae**, NM.
- LEAF SPOT. **Heterosporium allii**, CA, CO, WA; **Phyllosticta allii**, IL, NM; **Stemphylium vesicarium**, TX.
- NEMATODE, Bulb. Onion Bloat. **Ditylenchus dipsaci**, NY, TX.
- NEMATODE, Root Knot. **Meloidogyne incognita**.
- NEMATODE, Sting. **Belonolaimus gracilis**.
- NEMATODE, Stubby Root. **Paratrichodorus christiei**.
- NONPARASITIC. **Blast**, of inflorescence. Appears in Connecticut Valley when bright sun follows cloudy weather. Air pollution in NJ.
- Chlorosis**. Copper deficiency, FL, NY; Manganese deficiency, NY, RI.
- Scald**. High temperature, general in summer.
- Stain**, alkali spot. Contact with alkaline materials or ammonia fumes in transit.
- PHYTOPLASMA. **Aster Yellows, Clover Proliferation**, TX.
- POWDERY MILDEW. **Oidiopsis taurica**, CA; **Leveillula taurica**, ID, Pacific Northwest.
- ROT, Basal. **Fusarium oxysporum** f. sp. **cepae**, other species, widespread.
- ROT, Black Stalk, Tip Blight, Seed Mold. **Stemphylium botryosum**, AR, CA, LA, NH, TX, WA.
- ROT, Bulb. **Enterobacter cloacae**, WA.
- ROT, Charcoal. **Macrophomina phaseoli**, CA, OK, TX.
- ROT, Dry. **Diplodia natalensis**, TX; **Helminthosporium allii**, also canker.
- ROT, Neck; Gray Mold. **Botrytis allii**, CA, LA, NJ, TX; **B. cinerea**; Small Sclerotial; Leaf Blight, **B.** (*Botryotinia*, *Sclerotinia*) **squamosa**, occasional; **B. porri**, WA.
- ROT, Pink Root. **Pyrenochaeta terrestris**, widespread.
- ROT, Root. **Thielaviopsis basicola**, TX.
- ROT, Smudge. **Colletotrichum circinans**, general.
- ROT, Soft. **Kluyveromyces marxianus** var. **marxianus**, OR, WA.
- ROT, Various, of bulbs. **Aspergillus niger**, black mold, general in market; **Penicillium** spp., blue mold; **Rhizopus stolonifer**, soft, after sunscald or freezing; **Sclerotinia sclerotiorum**, watery soft; **Fusarium proliferatum**, bulb rot, WA.
- ROT, White. **Sclerotium cepivorum**, CA, KY, LA, ME, NJ, NY, OH, OR, PA, TX, VA.
- RUST. **Puccinia asparagi** (0, I, II, III), CA, CT, IA, KS, MN; **P. allii** (*P. porri*) (II, III), CA, CT, NE.
- SMUT. **Urocystis cepulae**, general; **U. colchici**.
- TWISTER DISEASE. **Colletotrichum gloeosporium**, GA.
- VIRUS. **Onion Yellow Dwarf**; Scape Blight caused by **Impatiens Necrotic Spot** and other Tosspovirus isolate/strain, ID, including Iris Yellow Spot, CO, GA, ID, NM, OR, TX, WA (also on wild onions, **Allium pskemense**, **A. vavilovii**, and **A. altaicum**); **Iris Yellow Spot**, CA, CO, HI, GA, NY, NV, NM, OR, TX, WA, Ontario, Canada, Uruguay.
- Smut is the most general onion disease, but it seldom afflicts onions grown from sets, the usual method for a small garden. Growing colored instead of white onions avoids smudge and neck rots to some extent. Sweet Spanish onions are resistant to pink root and yellow dwarf.
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- Onosmodium (Marbleseed)**
- ROT, Root. **Phymatotrichum omnivorum**, TX.
- RUST. **Puccinia recondita** (0, I), CO, KS, NE, ND.
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- Oplismenus (Basket-grass)**
- LEAF SPOT, Tar. **Phyllachora punctum**, FL, LA.
- 
- Orange**
- Citrus Fruits.



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**Orchids (*Dendrobium*)**

BLIGHT, Flower and Leaf; Rot, Root. **Fusarium proliferatum**, **F. solani**, **F. oxysporum**, **F. subglutinans**, HI.

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**Orchids (Imported Species)**

ANTHRACNOSE; Leaf and Stem Spot. **Colletotrichum cinctum** and **C. gloeosporioides** (*Glomerella cincta* and *G. cingulata*), general; **Gloeosporium affine**, FL; **G. cattleyae**, VA.

BACTERIAL BROWN ROT. **Erwinia cypripedii**; **Burkholderia gladioli**.

BACTERIAL BROWN SPOT. **Pseudomonas cattleyae**, common on *Cattleya*, severe on *Phalaenopsis*.

BACTERIAL Leaf Scorch and Pseudobulb Rot. Unidentified.

BACTERIAL Soft Rot. **Erwinia carotovora**, serious on *Cattleya* and other general, **E. chrysanthemi**, FL; **Burkholderia gladioli** (also leaf spot), HI; **Dickeya chrysanthemi**, FL.

BACTERIAL Water Soaked Leaves. **Dickey chrysanthemi**, **Erwinia chrysanthemi**, FL.

BLIGHT, Petal. **Botrytis cinerea** (*Sclerotinia fuckeliana*), spotting common on older flowers; **Glomerella** sp., black spot of *Vanda* orchids.

BLIGHT, Southern. **Sclerotium rolfsii**, FL.

BLOTCH, Sooty. **Gloeodes pomigena**.

DODDER. **Cuscuta gronovii**; Laurel-Dodder. **Cassytha filiformis**.

FLYSPECK. **Microthyriella rubi**.

LEAF ROT. **Sclerotinia rolfsii**, FL.

LEAF SPOT. **Cercospora epipactidis**; **C. cypripedii**; **C. peristeriae**; **C. dendrobii**; **C. odontoglossi**; **Chaetodiplodia** sp.; **Phyllostictina pyriformis**; **Physalospora** spp., also stem decay; **Diplodia laeliocattleyae**; **Phyllosticta** spp.; **Selenophoma** spp.; **Septoria selenophomoides**; **Volutella albido-pila**.

NEMATODE, Lesion. **Pratylenchus pratensis**; **P. scribneri**.

NONPARASITIC. **Cattleya Dry Sepal**. Industrial fumes.

ROT, Black; Leaf and Heart. **Phytophthora cactorum**, **P. phaseoli**, FL; **Pythium ultimum**, serious on *Cattleyas*; **P. splendens**.

ROT, Dry. **Nectria bulbicola**, secondary.

ROT, Root. **Rhizoctonia solani**; Soft, **Fusarium moniliforme**, CA.

ROT, Stem; Southern Blight. **Sclerotium rolfsii**.

RUST. **Uredo behnickiana** (II), FL, NJ, NY; **U. epidendri** (II) FL; **U. guacae** (II), FL; **U. nigropuncta** (II), FL; **Sphenospora kevorkianii**, FL; **S. mera**, FL; **S. saphena**, FL.

SNOW MOLD. **Ptychogaster** sp. Potting fiber mold.

SOOTY MOLD. **Capnodium citri**.

VIRUS. **Cymbidium Mosaic**, CA, HI; **Orchid Fleck**; **Mild Cattleya Color-Break**; **Severe Cattleya Color-Break**; **Cattleya Blossom Brown Necrotic Streak**; **Odontoglossum Ring Spot**, HI; **Oncidium Ring Spot**; **Tomato Spotted Wilt**, HI; **Vanda Ring Spot**; **Spiranthes Mosaic**, MD; **Odontoglossum Ringspot**, China, Japan, Taiwan; **Impatiens Necrotic Spot Virus**, FL.

WILT. **Fusarium oxysporum** f. sp. **cattleyae**, CA, FL, OH; **F. moniliforme**.

When dividing plants use a "hot knife" or disinfest between cuts; keep new orchids isolated; sterilize or fumigate the potting medium and disinfest the bench. Destroy plants seriously affected by rusts.

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**Orchids (Native Species)**

LEAF SPOT. **Cercospora cypripedii**, NY, WI; **Fusicladium aplectri**, DE; **Mycosphaerella cypripedii**, NY; **Phyllosticta aplectri**, DE; **Septoria calypsonis**, MI.

RUST. **Puccinia praegracilis** (*Aecidium graebnerianum*) (I), AK, CA, MT, OR, WA; **P. cypripedii** (II, III), IN, IA, MI, NJ, VA, WI; **Uredo goodyerae** (II, III), CA, CO, NM, OR, WA.

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**Oregano, Sweet Marjoram (*Origanum*)**RUST. *Puccinia menthae*, CA, FL.

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**Osage-Orange (*Maclura*)**BLIGHT, Leaf. *Sporodesmium maclurae*, MO, SC, TX; *Botrytis cinerea*, OR, gray mold on stems.DAMPING-OFF. *Pythium ultimum*, NE; *Rhizoctonia solani*, NE.LEAF SPOT. *Cercospora maclurae*, AL; *Ovularia maclurae*, AL, LA, TX; *Phyllosticta maclurae*, MO, NJ.MISTLETOE. *Phorodendron tomentosum*, TX; *P. serotinum* (*flavescens*), TX.ROT, Root. *Phymatotrichum omnivorum*, TX.RUST. *Cerotelium fici* (II), SC to FL and TX.WILT. *Verticillium* sp., CT.LEAF SPOT. *Cercospora oxalidiphila*, WI; *Phyllosticta guttulatae*, VT to NJ, IN, WI, *Ramularia oxalidis*, NE, NH, NM, OR, PA, TN, VT; *Septoria acetosella*, NY; tar spot, *Phyllachora oxalina*, DE, ME, VT.NEMATODE, Root Knot. *Meloidogyne* spp.NEMATODE, Stem. *Ditylenchus dipsaci*, NY.POWDERY MILDEW. *Microsphaera russellii*, ME to WV, KS, MN, WA.ROT, Root. *Thielaviopsis basicola*, CT.RUST. *Puccinia andropogonis* (0, I), OK, TX, II, III on *Andropogon*; *P. oxalidis* (II, III), FL, GA, LA, MS, NM, SC, TN, TX, WI; 0, I on mahonia; *P. sorghi* (0, I), IN, IA, KS, MI, MS, ND, OK, SD, TX; II, III on corn and *Euchlaena*.SMUT, Seed. *Ustilago oxalidis*, CT to MS, OH, TX, WI.VIRUS. **Beet Curly Top**, TX; **Tomato Ringspot**, PA; **Tomato Spotted Wilt**, PA; **Shamrock Chlorotic Ringspot**.

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**Osier, Basket-Willow (*Salix*)**CANKER. *Cryptomyces maximus*, Blister; *Valsa salicina*, Twig, Branch, CA, IA.RUST, Leaf. *Melampsora abieti-capraearum*, NY, PA.

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**Osoberry (*Osmaronia*)**LEAF SPOT. *Cylindrosporium nuttallii*, CA to OR, WA; *Gloeosporium osmaroniae*, WA.POWDERY MILDEW. *Phyllactinia corylea*, OR.

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**Owls Clover (*Orthocarpus*)**LEAF SPOT. *Ascochyta garrettiana*, OR, UT.RUST. *Cronartium coleosporioides* (II, III), CO, ID, UT; 0, I on pine.

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**Oxalis (Wood-Sorrel)**BLIGHT, Gray Mold. *Botrytis cinerea*, AK.

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**Oxydendron (Sourwood, Sorrel-Tree)**BLIGHT, Twig. *Sphaerulina polyspora*, NC.LEAF SPOT. *Cercospora oxydendri*, AL, MS, TX, WV; *Mycosphaerella caroliniana*, GA, NC, TX, WV.ROT, Root. *Phymatotrichum omnivorum*, TX.ROT, Wood. *Poria punctata*, WV.

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**Pachistima**LEAF SPOT. *Mycosphaerella pachystimae*, ID.

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**Pachysandra (Japanese-Spurge) Ground Cover**BLIGHT, Leaf; Stem Canker. *Volutella pachysandrae* (*Pseudonectria pachysandricola*), CT, DE, NJ, NY, PA, VA; *Sphaeropsis* sp., tip blight, secondary.LEAF SPOT. *Gloeosporium* sp., VA; *Phyllosticta pachysandrae*, NY, NC, PA, VA; *Septoria pachysandrae*, FL, TN.

NEMATODE, Root-Knot **Meloidogyne** sp.

VIRUS. **Alfalfa Mosaic**, NJ.

Volutella leaf blight is fairly common after injury or when plants are too crowded; pinkish spore pustules appear on stems, large brown areas on leaves.

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### **Pacific Wax Myrtle (*Myrica californica*)**

LEAF SPOT. **Phyllosticta myricae**, CA.

RUST. **Cronartium comptoniae** (II, III), OR.

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### **Painted Cup, Indian Paintbrush (*Castilleja*)**

LEAF SPOT. **Cercospora** sp., AK.

POWDERY MILDEW. **Erysiphe polygoni**, CO, WA; **Sphaerotheca macularis**, CO, WA, WI.

RUST. **Cronartium coleosporioides** (II, III), CA, CO, SD to NM, UT, WA, WY; 0, I on pine; **Puccinia andropogonis** (0, I), CA, IA MT, NM, WI; II, III on *Andropogon*; **P. castillejiae** (II, III), CA, UT.

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### **Palm (*Chamaedorea*)**

LEAF SPOT. **Bipolaris setariae**, FL; **Exserohilum (*Helminthosporium*) rostratum**, FL; **Phaeotrichoconis crotalariae**, FL.

ROT, Stem. **Gliocladium vermoeseni**, FL.

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### **Palm Areca (*Chrysalidocarpus*)**

BLIGHT, Southern. **Sclerotium rolfsii**, CA.

LEAF SPOT. **Bipolaris setariae**, FL; **Exserohilum (*Helminthosporium*) rostratum**, FL; **Phaeotrichoconis crotalariae**, FL.

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### **Palm, Coconut (*Cocos*)**

BACTERIAL, MLO. **Lethal Yellowing**, FL.

BLIGHT, Thread. **Pellicularia koleroga**, FL.

LEAF SCORCH; Leaf-Bitten Disease; Stem Bleeding. **Ceratocystis (*Endoconidiophora, Thielaviopsis*) paradoxa**, FL.

LEAF SPOT, Gray; Leaf Break. **Pestalotia palmarum**, secondary, FL.

ROT, Bud; Leaf Drop; Wilt. **Phytophthora palmivora**, FL; **Pythium** sp., wilt, FL.

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### **Palm, Date (*Phoenix*)**

BLIGHT, Inflorescence; Fruit Rot. **Fusarium** spp., AZ.

CANKER. **Penicillium vermoeseni**, CA.

FRUIT SPOT, BROWN. **Helminthosporium molle**, AZ; **Alternaria citri**, AZ, CA, TX.

LEAF SCORCH; Black Heart; Bud Rot. **Ceratocystis paradoxa**, AZ, CA.

LEAF SPOT. **Exosporium palmivorum**, Gulf states; **Pestalotia** sp., CA, FL; **P. palmarum**, FL; **Alternaria** sp., AZ, CA, FL, TX; **Annellophora phoenicis**, TX.

LEAF SPOT; STEM LESIONS. **Colletotrichum fragariae**, FL.

NEMATODE, Root Knot. **Meloidogyne** spp., AZ, CA.

NONPARASITIC. **Black Nose**. Fruit checking from rain and high humidity.

**Chlorosis**. Manganese deficiency, FL.

PHYTOPLASMA. **Witches' Broom**, GA, IL, IN, IA, OH.

ROT; Decline Disease. **Omphalia pigmentata** and **O. tralucida**, CA.

ROT, Fruit. **Aspergillus niger**, Calyx-end, CA, WA; **Catenularia fuliginea**, AZ, CA; **Penicillium roseum**, AZ, CA; **Pleospora herbarum**, CA; **Phomopsis phoenicola**, CA; **Alternaria stemphylioides**, CA.

ROT, Leaf-stalk; Shoot Blight; Fruit Rot. **Diplodia phoenicum**, AZ, CA.

ROT, Root. **Armillaria mellea**, CA; **Clitocybe tabescens**, FL; **Ceratostomella radiciola**, CA.

ROT, Wood. **Poria** spp., AZ, CA.

SMUT, False. **Graphiola phoenicis**, widespread.

WILT. **Fusarium oxysporum** f. sp. **canariensis**, LA, SC, TX; **F. oxysporum** f. sp. **palmarum**, FL.

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### **Palm, Fishtail (*Caryota*)**

BLIGHT, Leaf and Stem. *Glomerella cingulata*.  
 LEAF SPOT. *Bipolaris setariae*, FL; *Exserohilum*  
 (*Helminthosporium*) *rostratum*, FL;  
*Phaeotrichoconis crotalariae*, FL.  
 PHYTOPLASMA. **Lethal Yellowing**, Puerto Rico.

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### **Palm, Forster Sentry (Sentry Palm) Kentia (*Howeia*)**

LEAF SPOT. *Calonectria colhounii*;  
*C. crotalariae*; *C. theae*, HI.

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### **Palm, Pindo (*Butia*)**

ROT, Root. *Armillaria tabescens*, SC.

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### **Palm, Queen, Plumy Coconut (*Arecastrum*)**

CANKER; Gummosis. *Dothiorella gregaria*, CA;  
*Penicillium vermoeseni*, CA.  
 LEAF SPOT. *Bipolaris setariae*, FL; *Exserohilum*  
 (*Helminthosporium*) *rostratum*, FL;  
*Phaeotrichoconis crotalariae*, FL.  
 LEAF SPOT. *Exosporium palmivorum*, FL;  
*Glomerella cincta*, NJ; *Septoria cocoina*, MO.  
 LETHAL DECLINE, NECROSIS. *Fusarium*  
*oxysporum* f. sp. *palmarum*, FL.  
 NONPARASITIC. **Chlorosis**. Manganese deficiency,  
 FL.  
 ROT, Bud; Wilt. *Phytophthora palmivora*, FL;  
*Pythium* sp., wilt.  
 ROT, Butt. *Ganoderma sulcatum*, FL.  
 SMUT, False. *Graphiola phoenicis*, FL.

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### **Palm, Rhapsis (*Rhapis*)**

LEAF SPOT. *Bipolaris setariae*, FL; *Exserohilum*  
 (*Helminthosporium*) *rostratum*, FL;  
*Phaeotrichoconis crotalariae*, FL.

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### **Palm, Royal (*Roystonea*)**

ANTHRACNOSE; Petiole Spot. *Colletotrichum*  
*gloeosporioides*, FL, TX.  
 LEAF SPOT. *Alternaria* sp., FL; *Diplodia* sp., FL;  
*Epicoccum neglectum*, FL;  
*Helminthosporium* sp., leaf stripe, FL.  
 LITTLE LEAF. Cause unknown, FL.  
 NEMATODE, Root Knot. *Meloidogyne* sp., FL.  
 NEMATODE, Spiral. *Helicotylenchus nannus*.  
 PHYTOPLASMA. **Lethal Yellowing**, Puerto Rico.  
 SMUT, False. *Graphiola phoenicis*, FL.  
 WILT. *Phytophthora palmivora*, FL.

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### **Palm, Sugar (*Arenga*)**

SMUT, False. *Graphiola phoenicis*, occasional.

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### **Palm, Washington (*Washingtonia*)**

BACTERIAL Leaf Spot. *Pseudomonas*  
*washingtoniae*, AZ.  
 LEAF SPOT. *Auerswaldia* sp., CA; *Cercospora*  
 sp., FL; *Colletotrichum* sp., FL;  
*Cylindrocladium macrosporium*, FL;  
*Pestalotia palmarum*, FL; *Phoma*  
*palmicola*, secondary, TX.  
 LETHAL DECLINE; NECROSIS. *Fusarium*  
*oxysporum* f. sp. *palmarum*, FL.  
 NEMATODE, Root Knot. *Meloidogyne* spp., AZ,  
 FL.  
 ROT, Bud. *Penicillium vermoeseni*, CA;  
*Phytophthora palmivora*, AZ, FL.  
 ROT, Root. *Clitocybe tabescens*, FL;  
*Phymatotrichum omnivorum*, FL.  
 ROT, Trunk. *Phytophthora* sp., CA.  
 SMUT, False. *Graphiola phoenicis*, FL, TX.  
 VIRUS. **Palm Mosaic**, CA.  
 WILT. *Pythium* sp., FL.

The *Penicillium* bud rot causes serious losses to *Washingtonia filifera* in California; *W. robusta* is resistant.

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### Palmetto, Cabbage Palm (*Sabal*)

BLACK MILDEW. *Asterina sabalicola*, FL, GA; *Meliola* spp., Gulf states.  
 CANKER, Felt Fungus. *Septobasidium sabalis*, LA; *S. sabal-minor*, FL.  
 FRUIT DROP (Premature). *Colletotrichum pleosporioides*, FL.  
 LEAF SPOT. *Helminthosporium apiculiferum*, LA, MS; *Mycosphaerella serrulata*, FL, SC; *Phyllachora (Catacauma) sabal*, Black Spot, FL, GA, TX; *Phyllosticta palmetto*, LA, MS; *Myrianginella sabaleos*, Black Speck, FL, GA.  
 SMUT, False. *Graphiola congesta*, AL, FL, SC; *G. phoenicis*, FL, MS; *G. thaxteri*, FL.

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### Paloverde (*Cercidium*)

MISTLETOE. *Phoradendron californicum*, TX to CA.  
 ROT, Root. *Phymatotrichum omnivorum*, TX.

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### Pampas Grass (*Cordaderia*)

LEAF SPOT. *Helminthosporium* sp., GA; *Hendersonia culmiseda*, leaf mold; *Phyllosticta* sp., KY.

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### Pandanus (Screw Pine)

LEAF SPOT. *Heterosporium iridis*, IA; *Macrophoma pandani*, CA, FL; *Melanconium pandani*, FL, MD; *Phomopsis* sp., NJ; *Pestalotia palmarum*, secondary, FL; *Volutella mellea*, NY.  
 NEMATODE, Buitowling. *Radopholus similis*, FL.

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### Pansy (*Viola tricolor*)

ANTHRACNOSE. *Colletotrichum violae-tricoloris*, ME to FL, IN, MI, PA, WA.

BLIGHT, Gray Mold. *Botrytis cinerea*, AK, LA, NJ, probably general.

BLIGHT, Southern. *Sclerotium rolfsii*, FL, VA.

DAMPING-OFF; Root Rot. *Pythium* spp., CA, CT, MO, NJ; *Rhizoctonia solani*, DE, IL, MN, NY.

DOWNY MILDEW. *Peronospora violae*, AL, IL, MS, NE.

LEAF SPOT. *Alternaria violae*, NJ, NY, PA; *Cercospora violae*, CT, IN, MI, NY, TX, WI; *Phyllosticta rafinesquii*, AL, IL; *Ramularia agrestis*, OR; *R. lactea*, WA.

NEMATODE, Root Knot. *Meloidogyne* sp., NY, TX.

POWDERY MILDEW. *Sphaerotheca macularis*, IA, KS, WA.

ROT; Crown. *Myrothecium roridum*, AL.

ROT; Leaf Spot. *Centrospora acerina*, CA, GA.

ROT, Root; Wilt. *Aphanomyces cladogamus*, MD; *Fusarium oxysporum*, CT, MI, NE, NJ, NY, OH, TX; *Thielaviopsis basicola (Chalara elegans)*, CT.

RUST. *Puccinia ellisiana* (0, I), KS, NE; II, III on *Andropogon*; *P. violae* (0, I, II, III), CT, FL, KS, NJ, ND, SC; *Uromyces andropogonis* (0, I), CT; II, III on *Andropogon*.

SMUT, Seed. *Urocystis kmetiana*, AR, MO, TN.

SPOT ANTHRACNOSE; Pansy Scab. *Sphaceloma violae*, KY, MD, NJ.

VIRUS. **Beet Curly Top**, CA, OR, TX; **Mosaic, unidentified**, MD; **Western Cucumber Mosaic** and **Cherry Calico** cause flower break and leaf mottle in CA; **Tomato Spotted Wilt – Lettuce Serotype**, GA.

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### Papaya (*Carica*)

ANTHRACNOSE. *Colletotrichum capsici*, FL.

ANTHRACNOSE; Fruit, Stem, and Leaf Spot. *Glomerella cingulata*, general.

BLACK MILDEW. *Asterina caricarum*, FL.

BLIGHT, Flower; Leaf Spot. *Choanephora americana*, FL.

BLIGHT, Southern. *Sclerotium rolfsii*, TX.

DAMPING-OFF. *Pythium aphanidermatum*, CA, FL; *P. debaryanum*, TX; *Colletotrichum gloeosporioides*, HI; also seedling blight.

LEAF SPOT. *Asperisporium caricae*, FL;  
*Mycosphaerella caricae*, target spot, FL;  
*Phyllosticta caricae-papayae*, target spot, FL.  
 POWDERY MILDEW. *Golovinomyces*  
*cichoracearum*, CA; *Oidium caricae*, FL,  
 TX.  
 NEMATODE. *Meloidogyne* sp., FL, TX.  
 ROT, Crown, Collar. *Calonectria* sp.  
 (*Cylindrocladium*), HI.  
 ROT, Fruit. *Diplodia* sp., TX; *Colletotrichum*  
*magna*, Brazil.  
 ROT, Root. *Phymatotrichum omnivorum*, TX.  
 ROT, Stem. *Fusarium* sp., CA, TX.  
 VIRUS. **Tobacco Ring Spot; Papaya Mosaic;**  
**Papaya Ringspot.**

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### Parkinsonia

LEAF SPOT. *Cylindrosporium parkinsoniae*, TX;  
*Phyllosticta parkinsoniae*, TX.  
 MISTLETOE. *Phoradendron californicum*, CA,  
 TX.  
 ROT, Root. *Clitocybe tabescens*, FL;  
*Phymatotrichum omnivorum*, AZ, TX  
 SOOTY MOLD. *Capnodium* sp., TX.

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### Parrotfeather (*Myriophyllum*)

ROT, Root and Stem. *Pythium carolinianum*,  
 CA.

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### Parsley (*Petroselinum*)

BACTERIAL, MLO. **Aster Yellows**, CO, NY;  
**California Aster Yellows**, CA.  
 BACTERIAL Soft Rot. *Erwinia aroideae*, CA; *E.*  
*carotovora*, FL.  
 BLIGHT, Gray Mold. *Botrytis cinerea*, AK.  
 BLIGHT, Leaf. *Alternaria dauci*, CT; *Septoria*  
*petroselini*, CA, CT, NJ, NY.  
 DAMPING-OFF; Root Rot. *Pythium* sp., NJ; *Rhi-*  
*zoctonia solani*, NJ, NY.  
 DODDER. *Cuscuta* sp., TX.  
 LEAF SPOT. *Cercospora petroselini*, NJ;  
*Stemphylium* sp., NJ.

NEMATODE, Bulb. *Ditylenchus dipsaci*, CA.  
 NEMATODE, Pin. *Paratylenchus projectus*, MD.  
 NEMATODE, Root Knot. *Meloidogyne* spp., FL,  
 GA, KS, TX, VA.  
 POWDERY MILDEW. *Erysiphe heraclei*, CA, FL,  
 WA.  
 ROT, Root. *Phymatotrichum omnivorum*, TX;  
*Phytophthora cryptogea*, CA.  
 ROT, Stem. *Sclerotinia sclerotiorum*, CT, GA,  
 LA, NY, PA, TX, VA.  
 VIRUS. **Alfalfa Mosaic**, CA; **Strawberry Latent**  
**Ringspot**, CA; **Beet Curly Top**, CA; **Apium**  
**Virus Y**, **Potyvirus**, CA.

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### Parsnip (*Pastinaca*)

BACTERIAL Crown Gall. *Agrobacterium*  
*tumefaciens*, VA.  
 BACTERIAL, MLO. **Aster Yellows**, IL, ME, NY,  
 PA, SD, TX, WI, and **California Aster Yel-**  
**lows**, CA, WA.  
 BACTERIAL ROT. *Pseudomonas pastinacae*, NY;  
*Erwinia carotovora*, occasional in storage.  
 BLIGHT, Leaf; Canker. *Itersonilia perplexans*,  
 GA, MA, NY.  
 DOWNY MILDEW. *Plasmopara nivea*.  
 LEAF SPOT. *Alternaria* sp., NJ; *Cercospora*  
*pastinacae*, MD, NE, NY, TX, WV; *C.*  
*pastinacina*, CA, IN, MI, NY;  
*Cylindrosporium pastinacae*, UT, WI;  
*Ramularia pastinacae*, IN, MA, NY, ND,  
 OH; *Septoria pastinacae*, TX; *Cercospora*  
*pastinacae*, MA; *Phomopsis dichenii*.  
 NEMATODE, Root Knot. *Meloidogyne* spp., NJ to  
 KS and southward.  
 NONPARASITIC. **Heart Rot**. Boron deficiency, NY.  
 POWDERY MILDEW. *Erysiphe unbelliferarum*.  
 ROT, Black, Crown. *Centrospora acerina*.  
 ROT, Black Mold. *Rhizopus* spp., occasional in  
 storage.  
 ROT, Gray Mold. *Botrytis cinerea*, occasional.  
 ROT, Root. *Phymatotrichum omnivorum*, AZ,  
 TX; *Rhizoctonia solani*, black scurf, NC, TX;  
*Phytophthora parasitica*, dry rot, PA;  
*Phoma* sp.  
 ROT, Watery Soft. *Sclerotinia sclerotiorum*, CA,  
 IN, LA, MA.

SCAB. **Streptomyces scabies**, WA.  
 SCAB, Acid. **Streptomyces acidiscabies**, ME.  
 VIRUS. **Mosaic**, unidentified, OR, UT.

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### Partridge-Berry (*Mitchella*)

BLACK MILDEW. **Meliola mitchellae**, AL, FL, MS, PA.  
 ROT, Stem. **Sclerotium rolfsii**, MD.

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### Passion Flower (*Passiflora*)

ANTHRACNOSE, Postharvest. **Colletotrichum boninense**, **C. capsici** and **Glomerella** sp., FL.  
 BLIGHT, Southern. **Sclerotium rolfsii**, FL.  
 LEAF SPOT. **Colletotrichum gloeosporioides**, FL, also stem spot; **Cercospora biformis**, AR, NC; **C. fuscovirens**, ME to MO, TX; **C. regalis**, TX; **C. truncatella**, SC, TX; **Gloeosporium fructigenum**, LA; **Phyllosticta** sp., NJ; **Alternaria passiflorae**, FL, brown spot.  
 NEMATODE, Root Knot. **Meloidogyne** sp.  
 PHYTOPLASMA. Costa Rica.  
 ROT, Collar. **Sclerotinia** sp., CA.  
 ROT, Root. **Phymatotrichum omnivorum**, TX.  
 VIRUS. **Cucumber Mosaic**, CA; **Passiflora Latent**, FL.  
 VIRUS, Chlorosis. **Bean Common Mosaic**, FL.  
 WILT, Fusarium. **Fusarium oxysporum** f. sp. **passiflora**, CA.

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### Paulownia (Princess-Tree)

GALLS, Root. **Meloidogyne arenaria**, **M. incognita**, **M. javanica**, **M. mayaguensis**, FL.  
 LEAF SPOT. **Ascochyta paulowniae**, MD; **Phyllosticta paulowniae**, AL, MD, NY, OK.  
 POWDERY MILDEW. **Phyllactinia corylea**; **Uncinula clintonii**.  
 ROT, Root. **Phymatotrichum omnivorum**, TX; **Armillaria mellea**.  
 ROT, Wood. **Polyporus spraguei**, AL; **P. versicolor**, MD; **P. robiniophilus**.

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### Pawpaw (*Asimina*)

BLOTCH, Leaf. **Phloeospora asiminae**, IL, KS, MO, OH, WV.  
 BLOTCH, SOOTY; FLYSPECK. **Colletogloeum** sp., **Dissoconium aciculare**, **Pelaster** sp. P21, **P. fructicola**, **Stomiopeltis** sp. RS1, **S. versicola**, and **Dothiodesmycete** sp. CS2, IA.  
 CANKER; DIEBACK. **Nectria cinnabarina**; **Polyporus amplexatrens**, FL, GA; **Sphaeropsis asiminae**, MD, WV; **Valsa ambiens**, VA, WV.  
 LEAF SPOT. **Cercospora asiminae**, widespread; **Phyllosticta asiminae**, widespread; **Mycosphaerella** sp., IN, OH, WV; **Septoria asiminae**, TX.  
 PARASITIC LICHEN. **Strigula elegans** and **S. complanata**, Southern U.S., LA.  
 ROT, Root. **Phymatotrichum omnivorum**, TX.  
 ROT, Sapwood. **Poria isabellina**, VA, WV.

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### Pea (*Pisum*)

ANTHRACNOSE, Leaf and Pod Spot. **Colletotrichum pisi**, CT, GA, IA, ME, MS, TX.  
 BACTERIAL Blight. **Pseudomonas syringae** pv. **pisii**, general, especially East and South.  
 BACTERIAL Leaf Spot. **Pseudomonas syringae**, ID.  
 BACTERIAL Pink Seed. **Erwinia rhapontici**, MT, Alberta, Canada.  
 BLIGHT. **Ascochyta pisi**, SD.  
 BLIGHT, Ashy Stem, Charcoal Rot. **Macrophomina phaseoli**, TX.  
 BLIGHT, Foot Rot. **Mycosphaerella pinodes**, widespread, usually with **Ascochyta pinodella**.  
 BLIGHT, Leaf and Stem. **Choanephora conjuncta**, GA.  
 BLIGHT, Southern. **Sclerotium rolfsii**, FL.  
 DAMPING-OFF; Root Rot, Pod Rot. **Pythium** spp. and **Rhizoctonia solani**, general.  
 DODDER. **Cuscuta** sp., MO.  
 DOWNY MILDEW. **Peronospora viciae** (*P. pisi*), general, especially north central and Pacific Coast states.

- LEAF SPOT. *Alternaria* sp., seedling blight, DE, NH; *A. alternata*, blight, WI; *Ascochyta pisi*, general but rare in Northwest; *Cercospora pisa-sativae*, GA; *Fusicladium pisicola*, black leaf, ID, UT; *Pleospora hyalospora*, MS; *Septoria flagellifera*, MN, ND, SD, WI; *S. pisi*, widespread; *Stemphylium polymorphum*, ME.
- NEMATODE, Hop Cyst. *Heterodera humuli*, OR.
- NEMATODE, Lesion. *Pratylenchus neglectus*, *P. thornei*, ID.
- NEMATODE, Oat Cyst. *Heterodera avenae*, WA.
- NEMATODE, Pea Cyst. *Heterodera gottgingiana*, WA.
- NEMATODE, Root Knot. *Meloidogyne* spp., AZ, CA, FL, NC, SC, TX, UT, WI.
- NEMATODE, Sting. *Belonolaimus gracilis*.
- NONPARASITIC. **Chlorosis**. Manganese or zinc deficiency, FL, TX, WA.
- Intumescence**. Pod swellings, CA, NJ, WA.
- Seed Spotting**. Cause unknown.
- PINK SEED. *Erwinia rhapontici*, ND.
- POWDERY MILDEW. *Erysiphe polygoni*, general; *E. pisi*, *E. trifolii*, *E. baeumleri*, WA.
- ROT, Black Mold. *Rhizopus stolonifer*, cosmopolitan; gray mold, *Botrytis cinerea*, occasional.
- ROT, Foot. *Aphanomyces euteiches*, general except in far North.
- ROT, Root. *Aphanomyces euteiches*, ID, MN; *Fusarium solani* f. sp. *pisii*, widespread; *Pellicularia filamentosa*, stem canker, general; *Phoma* sp., NJ, WI; *Pyrenochaeta terrestris*, IA; *Phymatotrichum omnivorum*, TX; *Phytophthora* sp., CA, CT; *Thielaviopsis basicola*, AR, CA; *Rhizoctonia oryzae*, WA.
- ROT, Stem and Root. *Rhizoctonia solani*, ND.
- ROT, Stem; Wilt. *Sclerotinia sclerotiorum*, CA, DE, FL, ID, MT, NJ, PA, TX, VA, WA.
- RUST. *Uromyces fabae* (0, I, II, III), CA, ID, ME, MA, MN, NE, ND, WA, WY.
- SCAB; Black Spot; Leaf Mold. *Cladosporium pisicola*, CA, ME, OR, TX, UT, WA.
- VIRUS. **Pea Enation Mosaic**; **Pea Mosaic**; **Pea Mottle**; **Pea Streak**; **Wisconsin Pea Streak**; **Pea Wilt**; **Clover (red) Vein Mosaic**; **Tomato Spotted Wilt**; **Bean Leaf Roll**, CA.
- VIRUS. Seed-borne; **Pea Stunt**, WI, **Turnip Mosaic Virus**, MN.
- WILT. *Fusarium oxysporum* f. sp. *pisii*, NH to SC, CA, CO, ID, IL, MN, NE, MT, OR, WA; and race 2, Near Wilt; *Fusarium oxysporum* f. sp. *medicaginis*, MS.
- Resistant varieties are the answer to Fusarium wilt and some virus diseases. Using clean seed, preferably grown in the West, is the best way to avoid bacterial blight. A well-drained, fertile soil, 3- to 5-year rotation, cleaning up or plowing under pea refuse immediately after harvest, all help to produce healthy peas. Some organic soil amendments reduce pea wilt.
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- Peach (*Prunus persica*)**
- ANTHRACNOSE. *Colletotrichum acutatum*, SC.
- BACTERIAL Crown Gall. *Agrobacterium tumefaciens*, general.
- BACTERIAL Hairy Root. *Agrobacterium rhizogenes*, general.
- BACTERIAL Leaf Spot. *Xanthomonas pruni*, eastern, central, southern states.
- BACTERIAL, MLO. **Peach X-Disease**, CT, MA, MI, NY, OH, PA.
- BACTERIAL Shoot Blight; Canker; Gummosis. *Pseudomonas syringae*, CA, OR.
- BLIGHT, Blossom; Green Fruit Rot. *Sclerotinia sclerotiorum*, CA.
- BLIGHT, Leaf. *Fabraea maculata*, CA, NJ.
- BLIGHT; Shot-Hole Disease; Pustular Spot. *Coryneum carpophilum*, general.
- BLIGHT, Twig. *Coniothyrium* sp., TX; *Cyphella marginata*, OR; *Nectria cinnabarina*, AL.
- CANKER, Crown. *Phytophthora citrophthora*, CA; *P. cactorum*, stem, AR, CA; *P. syringae*, OR.
- CANKER; DIEBACK; Gummosis. *Botryosphaeria ribis* var. *chromogena*, FL, GA; *B. dothidea*, AL, FL, GA, LA, TN, TX; *Valsa (Cytospora) cincta* and *V. leucostoma*, widespread East and central states; *Coniothyrium fuckelii*, WV; *Ceratocystis fimbriata*, CA.
- CANKER; Peach; Constriction Disease. *Fusicoccum amygdali*, East and South. Sometimes reported as *Phoma persicae*.



- DAMPING-OFF. **Rhizoctonia solani**, AR, CT.  
 DIEBACK. **Phomopsis** sp., AL.  
 LEAF CURL. **Taphrina deformans**, general.  
 LEAF SCORCH, Stunting, Branch Dieback. **Xylella fastidiosa**, NM.  
 LEAF SPOT. **Phyllosticta circumscissa**, wide-spread; **P. persicae**, MD, NE, OH; **Mycosphaerella persicae**, frosty mildew, widespread.  
 LEAF SPOT; Shot-Hole. **Cercospora circumscissa**, general; **C. consobrina**, IL, LA.  
 NEMATODE. **Tylenchus palustris**, AL, AR, GA, VA.  
 NEMATODE, Dagger. **Xiphinema americanum**; **X. pacificum**, GA.  
 NEMATODE, Lesion. **Pratylenchus penetrans**; **P. vulnus**.  
 NEMATODE, Ring. **Criconemoides similis**, **C. xenoplax**, NJ.  
 NEMATODE, Root Knot. **Meloidogyne incognita**; **M. javanica**, on "nematode-resistant" varieties; **M. arenaria**.  
 NEMATODE, Sting. **Belonolaimus gracilis**.  
 NONPARASITIC. **Catface**. Insect blemish on fruit, often from plant bugs.  
**Chlorosis**. Iron and magnesium deficiency in alkaline soils, Southwest.  
**Gummosis**. Winter injury, bad drainage.  
**Internal Bark Necrosis**. Manganese toxicity, IL.  
**Little Leaf**. Zinc deficiency, CA.  
**Stem Pitting**. Cause unknown, WV.  
**Suture Spot**. Cause unknown. Decline, PA.  
 PHYTOPLASMA. Peach Rosette. Ontario Canada.  
 POWDERY MILDEW. **Podosphaera oxycanthae**, general; **Sphaerotheca pannosa** var. **persicae**, general.  
 ROT, Brown. **Monilinia fructicola**, general, SC.  
 ROT, Brown; Blossom and Twig Blight. **Monilinia laxa**, Pacific states.  
 ROT, Bud and Twig Blight. **Fusarium lateritium**, other spp., CA, GA, KS.  
 ROT, Fruit. **Botryosphaeria obtusa**, AL, GA; **B. dothidea**, AL, GA, SC; **Aspergillus niger**, black mold, cosmopolitan; **Botrytis cinerea**, gray mold, cosmopolitan; **Cephalothecium roseum**, pink mold, widespread; **Choanephora persicaria**, in market;  
**Diplodia natalensis**, gumming disease; **D. persicae**, GA; **Fusarium** spp., CA, IL, NY, TX; **Gibberella persicaria**, CA; **Gilbertella persicaria**, SC; **Glomerella cingulata**, occasional, AL, GA; **Rhizopus nigricans**, cosmopolitan; **Phomopsis** sp., NJ.  
 ROT, Pink Mold. **Trichothecium roseum**, CA.  
 ROT, Root. **Armillaria mellea**, cosmopolitan; **Clitocybe monadelphia**, AR, FL, MO, OK; **C. parasitica**, OK; **C. tabescens**, FL, GA; **Ganoderma curtisii**, NC, VA; **Phymatotrichum omnivorum**, AZ, TX; **Cylindrocladium floridanum**, GA.  
 ROT, Root and Crown. **Phytophthora megasperma**, NY, OH; **P. cryptogea**, NY, OH; **P. cactorum**, NY, OH.  
 ROT, Seedling Stem. **Sclerotium rolfsii**, South; wilt, **Cylindrocladium floridanum**; **Penicillium** sp.  
 ROT, Silver Leaf. **Stereum purpureum**, occasional.  
 ROT, Sour. **Geotrichum candidum**, CA, SC; **Issatchenkia scutulata**, CA; **Kloeckera apiculata**, CA.  
 ROT, Wood. **Fomes** spp.; **Lenzites saepiaria**; **Polyporus hirsutus**, **P. lacteus** and **P. versicolor**, cosmopolitan; **Stereum hirsutum**; **Shizophyllum commune**, wound rot.  
 RUST. **Tranzschelia discolor** (II, III), general; 0, I on anemone, hepatica.  
 SCAB. **Cladosporium carpophilum**, general.  
 SOOTY MOLD; Fruit Stain. **Fumago vagans**, cosmopolitan.  
 VIRUS. **Peach Asteroid Spot**, OK and TX to southern CA, OR, UT, WA; **Peach Calico**, ID, WA; **Peach Dwarf**; **Peach Golden Net**, CO; **Peach Little Peach**, eastern U. S., CT to NC to MI, MO; **Peach Mosaic**, OK, TX to CA, CO, UT; **Peach Mottle**, ID; **Peach Necrotic Leaf Spot**, MI, Puebla, Mexico; **Peach Phony Disease**, Southeast to MO, TX; **Peach Red Suture**, IN, MD, MI; **Peach Ring Spot**, CA, WA, **Peach Rosette**, SC to FL, MS, TN, MI to AR, OK; **Peach Rosette Mosaic**, MI, NY; **Peach Stubby Twig**; **Peach Wart**, AZ, CA, ID, OR, WA; **Peach Yellow Bud Mosaic**, CA, **Peach Yellow Leaf Roll**

(Western X-Disease, Cherry Buckskin), CA, CO, ID, OR, UT, WA; **Peach Yellows**; **Mule's Ear Disease** (Drake Almond Bud Failure); **Prunus Ring Spot**; **Cherry Yellows**; **Green Ring Mottle**; **Prunus Necrotic Ring Spot**, CA; **Tomato Ring Spot**, CA; **Peach Latent Mosaic Viroid**, WA; **Hop Stunt Viroid**, Ontario, Canada; **Plum Pox**, PA; **Stem Pitting**; **Fravirus carolinianan**, **Baccharis halimifolia**, VA.

WILT. **Verticillium albo-atrum**, occasional.

Brown rot is the No. 1 peach enemy, and spray schedules are built around it, although they start with a dormant spray for leaf curl. Get the latest advice and spray schedule from your county agricultural agent. Peach foliage is sensitive to arsenicals; do not allow a spray prepared for shade trees to touch peaches. The commercial propagator must take many precautions to provide stock free from the numerous viruses.

## Peanut (*Arachis*)

BACTERIAL Phytoplasma. **Aster Yellows**, OK.

BACTERIAL Wilt. **Pseudomonas solanacearum**, AL, FL, NC, VA.

BLIGHT. **Sclerotinia sclerotiorum**, TX.

BLIGHT, Seedling. **Rhizoctonia** spp., NC to FL, CA, OK, TX.

BLIGHT, Southern; Stem and Nut Rot. **Sclerotium rolfsii**, general.

BLIGHT, Stem. **Diaporthe sojae**, VA, WV; **Sclerotinia minor**, VA; **S. sclerotiorum**, GA; **Botrytis cinerea**, GA; **Phomopsis longicolla**, NM.

BLOTCH, Web. **Phoma arachidicola**, VA.

CANKER, STEM. **Fusarium oxysporum**, AL.

DAMPING-OFF. Synergistic interaction of **Pythium myriotylum**, **Fusarium solani**, **Meloidogyne arenaria**, FL.

LEAF SPOT. **Alternaria** sp., FL, MO, NJ, NM, SC; **Ascochyta** sp., AR; **Cercosporidium personatum**, VA; **Phoma** sp., MO, VA; **Phyllosticta** sp., AL, AR, MS; **Pleospora** sp., AR, OK; **Stemphylium** sp., ND; **Leptosphaerulina arachidicola**, GA, TX; **Sclerotinia homoeocarpa**, FL.

LEAF SPOT, Brown, Halo. **Mycosphaerella arachidicola**, general; **M. berkeleyi** (*Cercospora personata*), general.

LEAF and STEM DISEASE. **Cercospora zebrina** (clover isolate), NC.

NEMATODE. **Panagrolaimus subelongatus**, associated with shoot elongation.

NEMATODE, Leaf. **Aphelenchoides** sp.

NEMATODE, Lesion. **Pratylenchus brachyurus**, AL, FL, GA, SC, VA.

NEMATODE, Reniform. **Rotylenchus reniformis**.

NEMATODE, Ring. **Criconeoides cylindricum**.

NEMATODE, Root Knot. **Meloidogyne arenaria**; **M. hapla**; **M. javanica**, GA.

NEMATODE, Spiral. **Helicotylenchus nannus**.

NEMATODE, Sting. **Belonolaimus gracilis**; **B. longicaudatus**.

NEMATODE, Stubby Root. **Trichodorus christiei**.

NEMATODE, Stunt. **Tylenchorhynchus claytoni**.

NONPARASITIC. **Blue Stain**. Seedcoat discoloration.

**Chlorosis**. Excess lime; magnesium, manganese or iron deficiency.

**Necrotic Spot**. Nutrient deficiency.

**Pops**. Empty pods. Nutritional deficiency.

**Pouts**. Stunting and chlorotic spotting from thrips.

ROT, Black Mold, of Pods. **Cladosporium herbarum**, cosmopolitan.

ROT, Blue Mold, of Pods and Nuts. **Penicillium** sp., cosmopolitan.

ROT, Charcoal. **Macrophomina phaseoli**, CO, NC, OK, SC, TX.

ROT, Collar. **Diplodia gossypina**; **Lasiodiplodia theobromae**, NC, VA.

ROT, Crown. **Aspergillus niger**, GA, NM, TX.

ROT, Cylindrocladium Black Rot. **Cylindrocladium crotalariae**, NC, VA; **C. parasiticum**.

ROT, Gray Mold, Leaf. **Botrytis cinerea**, CT, MD, MS, TN, VA.

ROT, Peg, Pod, Root. **Calonectria** (*Cylindrocladium*) **crotalariae**, GA.

ROT, Root. **Curvularia inaequalis**, SC; **Helminthosporium** sp., OK;

**Phymatotrichum omnivorum**, AZ, TX;

**Pythium** sp., CA, GA, NC; **Thielaviopsis basicola**, NC.

ROT, Root and Pod. **Sclerotinia minor**, **S. sclerotiorum**, NC, VA; **Sclerotium rolfsii**, FL; **Sclerotinia sclerotiorum**, GA.

ROT, Seed. **Rhizopus** spp.; **Trichoderma viride**, SC.

ROT, Stem, Pod. **Fusarium** spp., also root rot, wilt; **Physalospora rhodina**, FL, GA; **Rhizoctonia solani**; **Sclerotium rolfsii**, FL; **Sclerotinia sclerotiorum**, GA, NM; **S. minor**, TX.

RUST. **Puccinia arachidis** (II), occasional, FL, GA, NC, TX, VA.

VIRUS. **Peanut Stunt**, AL, FL, GA, NC, VA; **Peanut Mottle**, GA, OK; **Cowpea Chlorotic Mottle**, SD; **Peanut Stripe**, GA; **Zuccinia Yellow Mosaic**, GA; **Impatiens Necrotic Spot**, GA, TX; **Peanut Top Paralysis**, OK; **Tomato Spotted Wilt**, AL, GA, VA, TX; **Peanut Chlorotic Ringspot**, GA.

WILT. **Pythium myriotylum**, VA; **Verticillium** sp., NM.

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## Pear (*Pyrus*)

ANTHRACNOSE, Northwestern. **Neofabraea malicorticis**, OR, WA.

BACTERIAL Blossom, Twig Blight; Canker. **Pseudomonas syringae**, AR, CA, CT.

BACTERIAL Crown Gall. **Agrobacterium tumefaciens**, general.

BACTERIAL Fire Blight. **Erwinia amylovora**, general.

BACTERIAL Fruit Rot. **Erwinia carotovora**, MA.

BLIGHT, Leaf; Black Fruit Spot. **Fabraea maculata**, general.

BLIGHT, Thread. **Pellicularia koleroga**, NC to FL, TX, WV.

BLIGHT, Twig. **Corticium salmonicolor**, FL, LA; **Fusarium** spp., occasional; **Phomopsis ambigua**, widespread; **Valsa leucostoma**, WA.

BLOTCH, Sooty. **Gloeodes pomigena**, eastern states to OK, TX.

CANKER. **Botryosphaeria dothidea**, AL; **Cytospora** spp., OR, VA, WA; **Nectria cinnabarina**, coral spot; dieback;

**N. galligena**, trunk canker; **Nummularia discreta**, DE, IA.

CANKER, Bark. **Glutinium microsporum**, OR; **Helminthosporium papulosum**, blister canker, black pox; **Myxosporium corticola**, NY to MI, MS, OR.

CANKER, Felt Fungus. **Septobasidium** spp., NC to FL, TX.

CANKER, Perennial. **Neofabraea perennans**, OR, WA.

DECLINE, Pear. **Candidatus Phytoplasma pyri**, Ontario, Canada.

FRUIT SPOT; Flyspeck. **Leptothyrium pomi**, eastern states.

LEAF SPOT. **Cercospora minima**, FL to TX; **C. pyri**, MI; **Coniothyrium pyrinum**, MA to AL, IA, TX; **Coryneum foliicola**, IN; **Hendersonia cydoniae**, NY; **Phyllosticta pyrurum**, IL, MS, SC; **Mycosphaerella sentina**, ashy leaf spot, fruit spot, widespread, especially in East.

MISTLETOE. **Phoradendron serotinum (flavescens)**, AZ, TX.

MISTLETOE, European. **Viscum album**, CA.

NEMATODE, Lesion. **Pratylenchus minyus**; **P. pratensis**, CA.

NEMATODE, Root Knot. **Meloidogyne** sp., CA.

NONPARASITIC. **Bitter Pit**. Moisture irregularity, Pacific Coast, NY.

**Black End**; **Hard End**. Oriental pear rootstocks on shallow, poor soil.

**Black Leaf**; **Brown Bark Spot**; **Brown Blotch**, of Kieffer fruit. Undetermined.

**Chlorosis**. Mineral deficiency, soil alkalinity, Pacific Coast.

**Cork**; **Drought Spot**; **Fruit Pitting**. Boron deficiency, Pacific Coast, TX.

**Exanthema**. Copper deficiency, CA, FL.

**Little Leaf**; **Rosette**. Zinc deficiency, sometimes boron, CA.

**Marginal Leaf Blight**; **Scorch**. Potassium or calcium deficiency, ID, WA.

**Red Leaf**. In Oriental pear, undetermined cause.

**Scald**. Immaturity; deficient ventilation.

**Stigmonose**. Insect punctures during growth, widespread.

**Target Canker**, Measles. Undetermined, CA, GA, NY, VA, WA.

POSTHARVEST DISEASE. **Sphaeropsis pyriputrescens**, MI.

POWDERY MILDEW. **Podosphaera leucotricha**, CO, MD, OR, WA; **P. oxyacanthae**, NJ.

ROT, Bitter; Twig, Branch Canker. **Glomerella cingulata**, widespread but not destructive.

ROT, Black; Canker; Leaf Spot. **Physalospora obtusa**, widespread.

ROT, Brown. **Monilinia fructicola**, eastern states, TX, WA.

ROT, Brown; Blossom Blight. **Monilinia laxa**. Pacific states.

ROT; Blossom and Twig Blight. **Botrytis cinerea**, widespread.

ROT, Collar, Root. **Phytophthora cactorum**, widespread; **P. citrophthora**, CA.

ROT, Fruit. **Alternaria** sp., black mold; **Aspergillus** sp., cosmopolitan; **Botryosphaeria ribis**, black rot, VA; **Cephalosporium carpogenum**, storage; **Trichothecium roseum**, occasional pink mold; **Cladosporium** sp., occasional; **Coprinus urticicola**, OR; **Gloeosporium** sp., widespread; **Neurospora sitophila**, ripe rot, NC; **Penicillium** spp., blue mold, widespread; **Phialophora malorum**, storage; **Phoma exigua**; **P. mali**; **Rhizopus nigricans**, black mold, cosmopolitan; **Pleospora fructicola**; **Sclerotinia sclerotiorum**, CA, WA; **Sporotrichum malorum**, storage rot, OR, WA; **Phacidiopycnis washingtonensis** (also Canker and Blight), WA; **Sphaeropsis pyriputrescens**, WA; **Potebniomyces pyri**, WA.

ROT, Heart. **Fomes ignarius**; **F. pinicola**; **Polyporus** spp.

ROT, Root. **Armillaria mellea**, widespread; **Phymatotrichum omnivorum**, AZ, OK, TX; **Xylaria** sp., ID, IN; **Xylaria mali**, VA; **Phytophthora cinnamomi**.

ROT, Silver Leaf. **Stereum purpureum**, NY, OR; **S. hirsutum**, trunk rot.

ROT, Stem, Calyx. **Phacidiopycnis piri** (also canker and postharvest fruit rot), OR.

ROT, Trunk. **Schizophyllum commune**, cosmopolitan.

RUST. **Gymnosporangium clavariiforme** (0, I), leaves and fruit, SC; **G. clavipes** (0, I), chiefly

on fruit; **G. fuseum**, CA; **G. globosum** (0, I), on leaves and fruit, eastern states to IA, MN; **G. hyalinum** (0, I), FL; **G. kernianum** (0, I), on leaves and fruit, AZ, CO; **G. nootkatense** (0, I), on Asiatic pear, AK; **G. sabinae**, MI.

SCAB. **Venturia pyrina**, general.

SPOT ANTHRACNOSE, Scab. **Elsinoë pini**, OR, WA.

VIROID. **Pear Blister**. Argentina.

VIRUS. **Apple Chlorotic Leaf Spot, Spy Epi-nasty Decline, Virginia Crab Stem Pitting and Browline, Apple Mosaic, Flat Limb, Pear Vein Yellows/Red Mottle, Pear Ring-Pattern Mosaic, Pear Latent** on Bradford Pear (*Pyrus calleryana*), MD; **Pear Stony Pit**, Pacific Coast states, NY; **Pear Decline**, CA, OR, WA; **Pear Leaf Curl**, CA; **Pear Bark Measles**, CO; **Apple Stem Pitting**, Argentina.

Fire blight is the limiting factor in pear production, many orchards having been abandoned because of this devastating bacterial disease. Kieffer pears and some Asiatic varieties are resistant and are being used in breeding; some resistant forms are now available. Sprays during blossoming, usually an antibiotic, sometimes combined with weak copper, are used in conjunction with sanitary measures for fire-blight control. Pear decline, a virus disease transmitted by the pear psylla, is serious on the Pacific Coast.

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### Pea-Tree (*Caragana*)

BACTERIAL Hairy Root. **Agrobacterium rhizogenes**, KY to NE, OK.

BLIGHT, Leaf. **Ascochyta** sp., OH; **Septoria** sp., MN.

BLIGHT, Pod. **Botrytis cinerea**, MA.

DAMPING-OFF. **Rhizoctonia solani**, ND.

LEAF SPOT. **Phyllosticta gallarum**, AK, WI.

POWDERY MILDEW. **Microspora (Erysiphe) palczewskii**, AK, ID, MN, ND, WA; **Erysiphe arborescens**, WI, Quebec, Canada.

ROT, Root. **Pellicularia filamentosa**, ND; **Phymatotrichum omnivorum**, TX; **Phytophthora cactorum**, wilt, of seedlings.

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**Pecan (*Carya illinoensis*)**

ANTHRACNOSE. **Glomerella cingulata**, GA.  
 BACTERIAL Crown Gall. **Agrobacterium tumefaciens**, widespread.  
 BLIGHT, Thread. **Pellicularia koleroga**, FL, NC.  
 BLOTCH, Leaf. **Mycosphaerella dendroides**, South.  
 CANKER. **Cytospora** sp., AZ.  
 CANKER; Black Bark Spot. **Myriangium tuberculans**, GA, MS.  
 CANKER; DIEBACK. **Botryosphaeria berengeriana**, AZ, SC, to FL.  
 CANKER, Stem. **Microcera** (*Fusarium*) **coccophila**, LA, TX.  
 LEAF SCORCH, FUNGAL. **Xylella fastidiosa**, **Pestalotia**, **Epicoccum**, **Curvularia**, **Fusarium**, LA.  
 LEAF SPOT. **Microstroma juglandis**, GA to TX; **Phyllosticta convexula**, OK; **Septoria caryae**, TX; **Pestalotia uvicola**, FL, TX.  
 LEAF SPOT, Algal. **Cephaleuros virescens**, FL.  
 LEAF SPOT, Brown. **Cercospora fusca**, prevalent through pecan belt.  
 LEAF SPOT; Downy Spot. **Mycosphaerella caryigena**, GA and FL to TX.  
 LEAF SPOT; Liver Spot. **Gnomonia caryae** var. **pecanae**, AL, AR, GA, LA, MS, TX.  
 LEAF SPOT; Vein Spot. **Gnomonia nerviseda**, AR, IL, LA, MS, TX.  
 LEAF SPOT; Zonate. **Cristulariella pyramidalis**, AL.  
 MISTLETOE. **Phoradendron serotinum** (**flavescens**), widespread Gulf states.  
 NEMATODE. **Paratylenchus** sp.; **Trichodorus** sp.  
 NEMATODE, Awl. **Dolichodorus obtusus**.  
 NEMATODE, Dagger. **Xiphinema americanum**, Southeast.  
 NEMATODE, Root Knot. **Meloidogyne** spp.; **M. incognita**; **M. partityla**, FL, GA.  
 NONPARASITIC. **Black Pit**; **Kernel Spot**. Feeding punctures of plant bugs.  
**Leaf Scorch**. Low fertility and soil moisture capacity.  
**Rosette**. Zinc deficiency.

**Sand Burn** of Seedlings. High temperature.

POWDERY MILDEW. **Microsphaera alni**, occasional.  
 ROT, Heart. **Schizophyllum commune**, after drought injury, OK.  
 ROT, Kernel and Shuck. **Phytophthora cactorum**, GA.  
 ROT, on nuts. **Aspergillus chevalieri**, storage mold; **Trichothecium roseum**, pink mold.  
 ROT, Root. **Armillaria mellea**, CA; **Helicobasidium purpureum**, TX; **Phymatotrichum omnivorum**, TX; **Pestalotia uvicola**, FL, TX; **Clitocybe tabescens**, GA.

SCAB. **Cladosporium effusum**, general.

SPOT ANTHRACNOSE; Nursery Blight. **Elsinoë randii**, southeastern and Gulf states.

VIRUS. **Bunch Disease**. Undetermined.

Pecan scab is the limiting factor in nut production in southeastern states, with strains of the fungus sometimes attacking varieties long considered immune; four or five sprays are required for control. In Arizona severe infection from *Phymatotrichum* root rot has come where trees are intercropped with lucerne, which provides a rapid transit medium for the fungus. Getting rid of the lucerne and treating with ammonium sulfate saves some trees. Zinc sulfate, added to the soil or to foliar sprays, controls rosette.

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**Pennisetum**

BACTERIAL STRIPE. **Acidovorax avenae** subsp. **avenae**, GA.

BLACK CHOKE DISEASE. **Ephelis** sp., MD.

BLIGHT, Basal Leaf. **Waitea circinata** var. **prodigus**, CA.

LEAF SPOT. **Helminthosporium giganteum**, MD; **Phyllosticta penicillariae**, GA; also stunt and chlorosis; **Gaeumannomyces graminis** var. **graminis** (also yellowing), CA.

LEAF SPOT, Gray. **Pyricularia grisea**, CA.

SMUT, Seed. **Ustilago penniseti**, VA.

VIRUS. **Maize Chlorotic Dwarf Virus**, OH.

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## Penstemon (Beard-Tongue)

BLACK MILDEW. *Dimerium alpinum*, CA.

LEAF SPOT. *Cercospora penstemonis*, AL, IN, KS, MT, NE, ND, OK, SD, TX, WI; *Cercospora nivosa*, CO, ID, OH, WA; *Phyllosticta antirrhini*, IL; *Ramularia penstemonis*, CA; *Septoria penstemonis*, CA, IL, ME, MI, MS, MO, NY, OK, TX, WA, WI.

LEAF SPOT; Stem Spot. *Ascochyta penstemonis*, CA.

NEMATODE, Root Knot. *Meloidogyne* sp.

NEMATODE, Stem. *Ditylenchus dipsaci*, VA.

POWDERY MILDEW. *Golovinomyces cichoracearum*, WA.

ROT, Crown, Stem. *Sclerotium rolfsii*, CT, IL, MA, NJ, TX.

ROT, Root. *Phymatotrichum omnivorum*, TX.

ROT, Root, Crown. *Phytophthora citrophthora*, CA.

RUST. *Puccinia andropogonis* (0, I), widespread; II, III on *Andropogon*; *P. confraga* (III), AZ; *P. palmeri* (0, I, III), AZ, CA, ID, WA, MT, to NM; *P. penstemonis* (III), AZ, CA, OR, UT.

VIRUS. *Cucumber Mosaic*, OR; *Turnip Vein-Clearing*, MN.

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## Peony (*Paeonia*)

ANTHRACNOSE. *Gloeosporium* sp., IL, KS, MD, MA, NJ, NC, PA, VA.

BACTERIAL Crown Gall. *Agrobacterium tumefaciens*, MD, MI.

BLIGHT, Early Bud Rot. *Botrytis paeoniae*, general.

BLIGHT, Late; Gray Mold. *Botrytis cinerea*, also leaf rot, general.

BLIGHT, Southern. *Sclerotium rolfsii*, MS, TX.

BLIGHT, Tip; Crown Rot. *Phytophthora cactorum*, CT, IL, IN, KS, NJ, NY, OH.

BLIGHT, Twig. *Pestalotiopsis paeonicola*, CT.

BLOTCH, Leaf, Stem; Measles. *Cladosporium paeoniae*, general.

CANKER, Stem Wilt. *Coniothyrium* sp., CA on tree peonies.

LEAF SPOT. *Alternaria* sp., occasional in north-eastern and central states; *Cercospora paeoniae*, IL; *Pezizella oenotherae*, MD, PA; *Phyllosticta* sp., NJ, PA, VA, *Septoria paeoniae*, also stem canker, ME, MI, MN, NJ, NY, OR, RI, WA, WI; *Cryptostictis paeoniae*, IL.

NEMATODE, Leaf and Stem. *Ditylenchus dipsaci*, NJ, WA.

NEMATODE, Root Knot. *Meloidogyne* spp., widespread; *M. hapla*; *M. incognita*.

NEMATODE, Spiral. *Rotylenchus buxophilus*.

NONPARASITIC. *Bud Blast*. Various causes, sometimes potassium deficiency.

*Le Moine Disease*; Club Root. Cause unknown, possibly virus.

POWDERY MILDEW. *Erysiphe polygoni*, TX.

ROT, Root. *Armillaria mellea*, CA, IA, MI, OR; *Fusarium* sp., CO, IN, MO, NE, NJ, OK; *Phymatotrichum omnivorum*, AZ, TX; *Rhizoctonia solani*, CT, IL, MN, NY, PA, VA; *Thielaviopsis basicola*, CT.

ROT, Stem; Wilt. *Sclerotinia sclerotiorum*, IL, MD, MN, NJ, NY, OH, OK.

VIRUS. *Peony Ring Spot*, MA to VA, CA, KS, MI, WA; *Tobacco Rattle*, AK; *Witches' Broom*, *Crown Elongation*. Cause unknown, MD, NY, VA; *Hosta Virus X*, *Tobacco Rattle Virus*; *Helleborus Net Necrosis*; *Nemesia Ring Necrosis*, *Diascia Yellow Mottle*, Pacific Northwest.

WILT. *Verticillium albo-atrum*, IL, KS, MD, NY, OH.

*Botrytis* blight is doubtless the best-known peony disease. Young shoots are rotted at base; buds turn black, flowers are blasted. Cutting down all tops at ground level in fall and spraying in spring when reddish shoots first show will reduce blight. Anthracnose, blotch, sometimes leaf spot, may be serious occasionally. In humid summers *Sclerotinia sclerotiorum* frequently kills stalks, filling the pith with very large sclerotia. Sickly plants may have root-knot nematodes. Lack of bloom may be due to too-deep planting, growing in shade, *Botrytis* blight, or nematodes.

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**Peperomia**

ANTHRACNOSE. *Colletotrichum* sp., WA;  
*Gloeosporium* sp., WA.

LEAF SPOT. *Myrothecium roridum*, FL.

NEMATODE. *Aphelenchoides ritzemabosi*;  
*Pratylenchus* sp.; *Radopholus similis*, FL.

ROT, Cutting; Root. *Rhizoctonia* sp.; *Pythium splendens*, CA; *Phytophthora palmivora*, CA; *P. nicotianae* var. *parasitica*, OH.

VIRUS. **Cucumber Mosaic**, SC; **Ring Spot**;  
**Oedema**, pimples in leaves, graft-transmissible, probably due to a virus; **Tobravirus**, IL, MI, MN.

The virus ring spot distorts leaves, which have chlorotic or brown necrotic rings; plants are stunted.

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**Pepper (*Capsicum*)**

ANTHRACNOSE; Fruit, Leaf and Stem Spot.  
*Gloeosporium piperatum*, MA to FL, IL, TX; *Glomerella cingulata*, fruit rot, CT to FL, KS, OH, TX; *Colletotrichum capsici*, ripe rot, MS; *C. boninense*, Brazil.

BACTERIAL Canker, Vascular. *Clavibacter michiganense*, IN, OH, WY, on *C. annuum* var. *cerasiforme*, and on *C. frutescens* (Bell Pepper), CA.

BACTERIAL Fruit and Stem Spot; Seedling Blight.  
*Xanthomonas vesicatoria*, general in South and East.

BACTERIAL Leaf Spot. *Xanthomonas vesicatoria*, NC, OH; *X. vitians*, OH; *Pseudomonas syringae*; *P. viridiflava*, FL.

BACTERIAL Soft Rot. *Erwinia aroideae*, and *E. carotovora* pv. *carotovora*, CA, FL, NJ; *Pseudomonas marginalis*, CA, FL, NJ, occasional in market.

BACTERIAL Wilt. *Pseudomonas solanacearum*, PA to FL.

BLIGHT; Blossom Rot. *Choanephora cucurbitarum*, FL, NC.

BLIGHT; Fruit Rot. *Phytophthora capsici*, CA, CO, FL, LA, MO, NM, NY, OH, TX, VA; *P. parasitica*, IL, IN.

BLIGHT, Southern. *Sclerotium rolfsii*, NC to FL.

DAMPING-OFF; Stem and Root Rot. *Pythium* spp., cosmopolitan; *Rhizoctonia solani*, cosmopolitan.

DODDER. *Cuscuta* sp., GA, NJ, VA.

DOWNY MILDEW. *Peronospora tabacina*, GA, NC, SC, TX.

FRUIT SPOT, Black. Nonparasitic, TX.

GIRDLING, Stem. *Nectria haematococca*, FL.

LEAF SPOT. *Ascochyta capsici*, WA, NY to FL; *Cercospora capsici*, frogeye; stem-end rot; *C. unamunoi*, CA and Gulf states; *C. apii*, Brazil; *Stemphylium solani*, FL; *S. botryosum* f. sp. *capsicum*, NY.

MOLD, Leaf. *Cladosporium herbarum*, CA, GA, TX; Seed Mold, *Stemphylium botryosum*, CT, FL.

NECROSIS, Vascular. *Verticillium dahliae*, NM.

NEMATODE, Awl. *Dolichodorus heterocephalus*.

NEMATODE, Burrowing. *Radopholus similis*.

NEMATODE, Lesion. *Pratylenchus penetrans*.

NEMATODE, Root Knot. *Meloidogyne arenaria*; *M. incognita*; *M. hapla*.

NEMATODE, Spiral. *Helicotylenchus erythrinae*.

NEMATODE, Stylet. *Tylenchorhynchus claytoni*; *T. capitatus*.

NEMATODE, Tobacco Cyst. *Heterodera tabacum*, VA.

NONPARASITIC. **Blossom-End Rot**. Deficient water supply, also lack of calcium.

**Sunscauld**. High temperature, often after defoliation.

PHYTOPLASMA. **Brote Grande**, **Phyllody**. NM, U.S. Desert Southwest.

PHYTOPLASMA, Chlorosis, Pale Green. *Candidatus Liberibacter solanacearum*, Mexico.

PHYTOPLASMA, Leaf Cup Stunt. *Candidatus Liberibacter solanacearum*, New Zealand.

PHYTOPLASMA, Little Leaf. *Phytoplasma asteris*, Mexico.

PHYTOPLASMA, Stunting, Small Leaves, Aborted Seed Pods, Costa Rica.

POWDERY MILDEW. *Leveillula taurica*, AZ, CA, FL, HI, MD, NV, NY, OK, UT, Pacific Northwest, British Columbia, Canada.

ROT, Black; Internal Mold, Early Blight. *Alternaria* spp., general after sunscauld and blossom-end rot.

ROT, Charcoal. **Macrophomina phaseoli**, CA, GA, KS, NJ, TX.

ROT, Crown. **Sclerotinia minor**, CA.

ROT, Collar. **Fusarium solani** f. sp. **eumartii**, CA.

ROT, Fruit. **Colletotrichum capsici** and **C. nigrum**, general; **Colletotrichum gloeosporioides** and **C. coccodes**, FL; **Diaporthe phaseolorum**, MS, MO; **Phoma destructiva**, AL, DE, FL, GA, MS, NY; **Penicillium** sp., GA; **Rhizopus stolonifer**, FL, TX, WA; **Sclerotinia sclerotiorum**, also stem rot, CA, CT, FL, MA, OH; **Fusarium** spp.; **F. solani**, **Nectria haematococca**, also stem canker; **F. subglutinans**, British Columbia, Canada.

ROT, Gray Mold. **Botrytis cinerea**, occasional in market or field.

ROT, Pod. **Curvularia lunata**, FL; **Nematospora coryli**, yeast spot after plant bug injury.

ROT, Root. **Aphanomyces** sp., NJ, of seedlings; **Phymatotrichum omnivorum**, AZ, TX; **Pythium aphanidermatum**, FL; **P. myriotylum**, FL; **P. helicoides**, FL; **P. splendens**, FL; **P. arrhenomanes**, FL; **P. catenulatum**, FL; **P. irregulare**, FL; **P. graminicola**, FL; **Fusarium solani** f. sp. **eumartii**, CA.

VIRUS. **Pepper Mottle**, CA; **Pepper Strain of Alfalfa Mosaic**; **Pepper Vein-Banding Mosaic** (Potato Y virus); **Potato Virus X**; **Cucumber Mosaic**, FL; **Tobacco Mosaic**; **Tobacco Mosaic** (Jalapeno Pepper), NY; **Tobacco Etch**; **Aster Ring Spot**; **Beet Curly Top**, Mexico; **Tomato Spotted Wilt**, FL, IN, LA, OH, OR, TN; **Pepper Mild Mottle**, FL, OR, SC; **Pepper Mild Tigre**, TX; **Pepper Texas**, TX; **Serrano Golden Mosaic**, AZ; **Tomato Leaf Curl**, CA, Mexico; **Potato Virus Y** and **Tobacco Ring Spot**, TX; **Impatiens Necrotic Spot**, WA; **Tomato Yellow Leaf Curl**, Baja, CA, Guatemala, Sur, Mexico; **Tomato Chlorosis**, Brazil; Costa Rica.

WILT. **Fusarium annuum**, AZ, CO, LA, ME, MS, NJ, NM, OK, TX; **Verticillium albo-atrum**, CA, CO, CT, LA, NY, TX; **V. dahliae**, NM.

To control bacterial spot and anthracnose rotate crops, avoiding land growing potatoes, tomatoes, or eggplant the previous year, and do not grow next to other solanaceous crops. To avoid sunscald, keep fruits shaded; spray to control leaf spots to prevent defoliation. For virus diseases, obtain healthy seed or use resistant varieties. Do not start plants in greenhouses with petunias or Jerusalem cherries; do not smoke or handle tobacco near plants; control aphid vectors; control weed hosts before the crop is planted.

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### Pepper-Grass, Garden Cress (*Lepidium*)

DAMPING-OFF. **Pythium debaryanum**, TX; **Rhizoctonia solani**, TX.

DOWNY MILDEW. **Peronospora lepidii**, IA, SD, TX.

ROT, Crown. **Sclerotinia sclerotiorum**, MA.

ROT, Root. **Pyrenochaeta terrestris**, pink root, ND, SD; **Phymatotrichum omnivorum**, TX.

RUST. **Puccinia aristidae** (0, I), TX; II, III on grasses.

VIRUS. **Bidens Mottle**, FL.

WHITE RUST; White Blister. **Albugo candida**, general; CA.

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### Pepper Vine, Cissus (*Ampelopsis arborea*)

BLIGHT, Thread. **Pellicularia koleroga**, LA.

DODDER. **Cuscuta compacta**, FL.

LEAF SPOT. **Cercospora arborea**, TX; **C. vitis**, LA; **Guignardia bidwellii** f. sp. **parthenocissi**, MS, NJ.

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### Periwinkle, Madagascar (*Catharanthus*)

BLIGHT, Foliar. **Phytophthora tropicalis**, VA.

BLIGHT, Web. **Rhizoctonia solani**, LA; **Sclerotium rolfsii**, LA.

PHYTOPLASMA, Yellowing and Witches' Broom. **Candidatus brasiliense**, Brazil.



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## Persimmon (*Diospyros*)

ANTHRACNOSE. *Colletotrichum acutatum*, NC.  
 ANTHRACNOSE; Fruit, Twig, Blight. *Gloeosporium diospyri*, East and South to KS.  
 BACTERIAL Crown Gall. *Agrobacterium tumefaciens*, CA.  
 BACTERIAL, Witches' Broom. MLO, TX.  
 BLIGHT, Thread. *Pellicularia koleroga*, FL, on Japanese persimmon.  
 BLIGHT, Twig. *Phoma diospyri*, FL, SC; *Physalospora obtusa*, Gulf states.  
 BLOTCH, Leaf. *Mycosphaerella diospyri*, Gulf states.  
 CANKER; DIEBACK. *Diplodia natalensis*, AL, TX; *Botryosphaeria ribis*, AL, LA, MD.  
 FRUIT SPOT; FLYSPECK. *Leptothyrium pomi*, FL; *Macrophoma diospyri*, AL, NJ, TX; *Dissoconium mali*, IA, China.  
 LEAF SPOT, Algal. *Cephaleuros virescens*, FL.  
 LEAF SPOT, BROWN. *Cercospora diospyri*, IL, ME, MS, SC, TX, VA; Black, *C. fuliginosa*, AL, FL, GA, IL, MS, TX; *Pestalotia* sp., secondary; *Phyllosticta* sp., FL, IN; *Ramularia* sp., FL; *Fusicladium levieri*, CT, FL, MS.  
 MISTLETOE. *Phoradendron serotinum* (*flavescens*), FL, TX; *Viscum album*, CA, on *Diospyros kaki* (Japanese Persimmon).  
 NEMATODE, Citrus. *Tylenchulus semipenetrans*, CA.  
 NEMATODE, Root Knot. *Meloidogyne* sp., FL, SC, TX.  
 POWDERY MILDEW. *Podosphaera oxycanthae*, TX.  
 ROT, Fruit. *Alternaria* sp., occasional on Japanese persimmon; *Botrytis cinerea*, gray mold; *Penicillium expansum*, blue mold, cosmopolitan; *Physalospora* spp., AL, AZ, GA, NY, TX; *Rhizopus stolonifer*, TX.  
 ROT, Root. *Armillaria mellea*, CA; *Phymatotrichum omnivorum*, TX.  
 ROT, Wood. *Daedalea ambigua*, LA, MS; *Daldinia concentrica*, LA, VA; *Fomes* spp.; *Hericium erinaceus*, LA; *Lentinus tigrinus*, LA, MS; *Pleurotus ostreatus*, LA, MS;

*Polyporus* spp.; *Schizophyllum commune*, KY, TN.

WILT. *Cephalosporium diospyri*, AL, AR, FL, GA, MS, NC, OK, SC, TN, TX; *Verticillium albo-atrum*, TX.

Persimmon wilt started in Tennessee in 1933, and at the end of 5 years only 5 % of the persimmons in that native stand were alive. Oriental persimmons are resistant.

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## Petalostemon (Prairie-Clover)

ROT, Root. *Phymatotrichum omnivorum*, TX.  
 RUST. *Puccinia andropogonis* (0, I), ND to KS, CO, TX, WY; *Uropyxis petalostemonis* (0, I, II, III), WI to ND, CO, NM.

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## Petasites (Butter-Bur)

GALL, Leaf. *Synchytrium aureum*, WI.  
 LEAF SPOT. *Ramularia variegata*, WI; *Stagonospora petasitidis*, WI.  
 RUST. *Puccinia conglomerata*, MI, MN, NY, WI; *P. poarum*, AK.

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## Petunia

BACTERIAL Fasciation. *Clavibacter fascians*, CA, OH, PA.  
 BACTERIAL, MLO. Aster Yellows.  
 BACTERIAL Wilt. *Pseudomonas solanacearum*, FL.  
 BLIGHT, of old flowers. *Choanephora conjuncta*, GA; *C. cucurbitarum* (whole plant), LA; *Phytophthora infestans*, CA, MD, NY; *Sclerotinia sclerotiorum*, LA.  
 BLOTCH, Leaf. *Cercospora petuniae*, FL, OK.  
 DAMPING-OFF. *Rhizoctonia solani*, FL, NJ, NY, NC, OK, PA, TX.  
 DODDER. *Cuscuta* spp., MD, NJ, NY, OK, TX, WV.  
 LEAF SPOT. *Ascochyta petuniae*, TX.  
 NONPARASITIC. Air Pollution Injury.  
 NEMATODE, Root Knot. *Meloidogyne* spp., general in South, occasional in greenhouses.

POWDERY MILDEW. *Oidium* sp., MN, NJ, NY, VA, Austria, Hungary.

ROT, Black Stem. *Stemphylium botryosum*, secondary, TX.

ROT, Crown. *Phytophthora nicotianae* var. *parasitica*, FL; *Phytophthora parasitica*, CO.

RUST. *Puccinia aristidae* (0, I), AZ.

VIROID. **Tomato Chlorotic Dwarf**, USA.

VIRUS. **Beet Curly Top**, CA, OR; **Tobacco Etch; Tobacco Mosaic; Cucumber Mosaic**, general; **Tobacco Ring Spot; Tomato Spotted Wilt**, CA; **Impatiens Serotype**, GA, FL; **Petunia Vein-Clearing**, MN; **Potato Rugose Mosaic; Bidens Mottle**, FL; **Bromegrass Mosaic**, General; **Calibrachoa Mottle**, CA, FL.

WILT. *Fusarium* sp., WA; *Sclerotinia sclerotiorum*, WA; *Verticillium albo-atrum*, CA.

Dodder is common on petunias, reported in window boxes as well as in garden beds. Plants started in greenhouses may get infected with tobacco mosaic. Smoking around petunias, or a tobacco-stem mulch, may also foster mosaic.

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## Philibertia

POWDERY MILDEW. *Phyllactinia corylea*, FL.

RUST. *Puccinia bartholomaei* (0, I), AZ; *P. obliqua* (III), AZ, CA, FL, NM, TX.

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## Philodendron

ANTHRACNOSE. *Gloeosporium* sp., WA; *Colletotrichum* sp., WA.

BACTERIAL Leaf Rot. *Erwinia chrysanthemi*, FL.

BLIGHT, Southern. *Sclerotium rolfsii*, CA.

LEAF SPOT. *Colletotrichum philodendri*, NJ.

NEMATODE, Burrowing. *Radopholus similis*, FL; Root Knot. *Meloidogyne* sp.

NEMATODE, Spiral. *Helicotylenchus nannus*: Lesion *Pratylenchus* sp., FL.

NONPARASITIC. **Exudation** of sugars, CA.

ROT, Root. *Pythium splendens*, FL.

ROT, Stem. *Phytophthora* spp., FL.

SOOTY MOLD. *Capnodium* sp.

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## Phlox

BACTERIAL Crown Gall. *Agrobacterium tumefaciens*, NJ.

BACTERIAL Fasciation. *Clavibacter fascians*, CA. BACTERIAL, MLO. **Aster Yellows**, NJ, NY, PA, and **California Aster Yellows**, CA.

BLIGHT, Gray Mold. *Botrytis cinerea*, AK.

BLIGHT, Southern; Crown Rot. *Sclerotium rolfsii*, CT, FL, IL, MD, NJ, NY, OH, TX, VA.

BLIGHT, Stem. *Pyrenochaeta phlogis*, NY.

CANKER, Stem. *Colletotrichum* sp., FL.

DOWNY MILDEW. *Peronospora phlogina*, IA, WI.

LEAF SPOT. *Ascochyta phlogis* var. *phlogina*, MA, NY, TX; *Cercospora omphakodes*, NY to IA, WI; *Macrophoma cylindrospora*, CA; *Phyllosticta* sp., WA; *Septoria* spp.; *Volutella phlogina*, LA; *Ramularia* sp., WA; *Stemphylium botryosum* (*Pleospora herbarum*), NJ.

NEMATODE, Leaf. *Aphelenchoides fragariae*, MD

NEMATODE, Leaf and Stem. *Ditylenchus dipsaci*, CA, CT, MD, NJ, NY, OH, TX, WA. NEMATODE, Root Knot. *Meloidogyne* spp., KS, MD, MA, NJ, OH, TX, WA.

NONPARASITIC. **Leaf Drop**; "Rust," Blight. Cause uncertain but includes inability of old stems of some varieties to take up enough water.

POWDERY MILDEW. *Golovinomyces cichoracearum*, general; *Sphaero theca macularis*, KS, NH, NY, OH, WA.

ROT, Charcoal. *Macrophomina phaseoli*, IL.

ROT, Root. *Thielaviopsis basicola*; *Phymatotrichum omnivorum*, TX.

RUST. *Puccinia douglasii* (0, I, III), CO, MT, NE, NJ, NM, OR, PA, UT, WA, WY; *P. plumbaria* (0, I, III), IL, IA, MO, TX, WY to NM, CA, WA; *Uromyces acuminatus* var. *polemonii* (0, I), IL, IA, MN, MS, SD, WI.

VIRUS. **Angelonia Flower; Mosaic**, MD, NY, NC; **Tomato Spotted Wilt-Impatiens Serotype**, GA, FL; **Tobravirus**, IL, MI, MN.

WILT. **Verticillium albo-atrum**, MN, NY.

When gardeners talk about “rust” on phlox, they usually mean the physiological blight, for true rusts are uncommon on perennial summer phlox. Powdery mildew is general and especially disfiguring when plants are shaded or crowded with little air circulation. Sulfur dust is still good.

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### Phoenix-Tree (*Firmiana simplex*)

BLIGHT, Web. **Rhizoctonia microsclerotia**, FL.  
CANKER; Coral Spot. **Nectria cinnabarina**, OK.  
ROT, Root. **Phymatotrichum omnivorum**, TX.

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### Photinia (Christmasberry, Toyon and Oriental Species)

ANTHRACNOSE. **Gloeosporium** sp., MS.  
BACTERIAL Fire Blight. **Erwinia amylovora**, CA, NJ.  
BLIGHT, Leaf. **Fabraea maculata**, CA, LA.  
DIEBACK. **Cytospora** sp.  
LEAF SPOT. **Cercospora** sp., GA; **C. heteromeles**, CA, TX; **C. photiniae-serrulata**; **C. eriobotryae**; **Lophodermium heteromeles**, CA; **Phyllosticta heteromeles**, CA, TX; **Pestalotia** sp., NJ; **Septoria photiniae**, CA, PA.  
POWDERY MILDEW. **Podosphaera leucotricha**, CA; **Sphaerotheca pannosa**, OR.  
ROT, Crown. **Phytophthora cactorum**, CA.  
ROT, Root. **Clitocybe tabescens**, FL; **Phymatotrichum omnivorum**, TX; **Phytophthora lateralis**, NC; **P. syringae**, NC.  
RUST. **Gymnosporangium japonicum** (0, I), III on juniper; **G. clavipes**, MA.  
SCAB. **Photinia photinicola** (*Spilocaea eriobotryae*), on leaves, berries, CA.

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### Physostegia (False Dragonhead)

BLIGHT; Southern Crown Rot. **Sclerotium rolfsii**, VA to OK, CT, KS, NJ, NY, WI.

DOWNY MILDEW. **Plasmopara cephalophora**, WI.

LEAF SPOT. **Mycosphaerella physostegiae**, GA, VA; **Septoria physostegiae**, IL, WI.

ROT, Stem. **Sclerotinia sclerotiorum**, ME.

RUST. **Puccinia physostegiae** (III), IN, MT, NH, NY.

VIRUS. **Tomato Spotted Wilt**, PA.

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### Pick-a-Back (*Tolmiea*)

POWDERY MILDEW. **Sphaerotheca** sp., OR.

VIRUS. **Tomato Spotted Wilt**, PA.

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### Pieris (Mountain, Japanese Andromeda)

BLIGHT, **Phytophthora ramorum**, OR; **P. tropicalis**, VA.

BLIGHT, Twig. **Cytospora** sp., OR.

DIEBACK. **Phytophthora** sp., PA; **Phytophthora cambivora**, NC.

LEAF SPOT. **Pestalotia** sp., CT, NJ; **Phyllosticta andromedae**, NJ; **P. maxima**, CT, NJ; **Alternaria tenuis**, RI.

LEAF SPOT, Tar. **Rhytisma andromedae**, FL, GA.

ROT, Root. **Armillaria mellea**, NJ.

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### Pigeon Pea (*Cajanus*)

PHYTOPLASMA, **Witches' Broom**. FL.

VIRUS. **Pigeon Pea Golden Mosaic**.

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### Pine (*Pinus*)

BLACK MILDEW. **Lembosia acicola**, CA.

BLIGHT, Diplodia. **Diplodia pinea**, AL, LA, MS.

BLIGHT, Brown Felt. **Herpotrichia nigra**, Northwest, on snow-buried foliage at high altitudes; **Neopeckia coulteri**, CA, MT.

BLIGHT, Brown Spot Needle. **Systemma (Scirrhia) acicola**, on hard pines in South, on Red pine, WI.

BLIGHT, Foliage. **Rhizoctonia solani**, VA.

- BLIGHT, Needle. *Cytospora pinastri*, ME, NJ, PA; *Hendersonula pinicola*, NC, TN, WY; *Pullularia pullulans*, after insect injury; *Dothistroma pini*, IL, IA, NE, OH, OK, MD; *Septoria spadicea*, MN, NH, NY, VT, VA; *Lecanosticta* sp.; *Dothistroma pini*, MN, MT, PA; *D. septospora*, PA, VT; *Lophodermella cerina*, AL, FL, LA, MS.
- BLIGHT, Seedling. *Botrytis cinerea*, cosmopolitan; *Cylindrocladium scoparium*, NJ; *Fusarium subglutinans*, AL, NC, seedling mortality; *Rhizina undulata*, CA, ME, MN, northern Rocky Mts.; *Thelephora terrestris*, KS, ME, NJ, OH, PA, northern Rocky Mts.; *Scleroderris lagerbergii*, MI, NY, WI, also canker.
- BLIGHT, Shoot. *Fusarium moniliforme* var. *subglutinans*, FL, GA; *Diplodia gossypina*, GA; *Gremmeniella abietina*, NH, NY; *Sphaeropsis sapinea*, NE; *Diplodia pinea*, TX, WI.
- BLIGHT, Snow. *Phacidium infestans*, occasional, New England; *P. convexum*, NC.
- BLIGHT, Tip; Twig; Collar Rot. *Diplodia pinea* (*Sphaeropsis ellisii* and *S. Sapinea*), New England to CA, IA, KS, ND, SD, VA, WI. *Cenangium ferruginosum* (*C. abietis*), "pruning twig blight," widespread, sometimes secondary; *Monochaetia pinicola*.
- CANKER. *Atropellis pinicola*, Northwest; *A. piniphila*, Northwest, AL, NM, TN; *A. tingens*, GA, MA, NH, NC, PA, VA; *A. arizonica*, AZ; *Caliciopsis pinea*, New England to SC, TN; *Dasyscyphus ellisiana*, on introduced pines in eastern states; *D. pini*, on five-needle pines, Pacific Northwest, MI; *Nectria* spp., New England to NC, IA; *Rhabdospora mirabilissima*, of seedlings, NY; *Tympanis confusa*, VA.
- CANKER. *Scleroderris lagerbergii* on red pine MI, MN, NY, VT, WI.
- CANKER, Bark. *Aleurodiscus amorphus*, widespread; Felt, *Septobasidium* spp.
- CANKER, Bleeding. *Sphaeropsis ellisii*, PA.
- CANKER, Pitch. *Fusarium lateritium* f. sp. *pini*, FL, VA; *F. moniliforme* var. *subglutinans*, FL, NC; *F. circinatum*, AL, CA.
- DAMPING-OFF. *Rhizoctonia solani* and *Pythium* spp., cosmopolitan; *Fusarium moniliforme* var. *intermedium*, GA.
- DECLINE. *Helicotylenchus multicinctus*, GA.
- DIEBACK, Branch. *Diplodia pinea*, WI.
- DIEBACK, Tip. *Sirococcus strobilinus*, CA, MI, MN, WI.
- MISTLETOE. *Psittacanthus macrantherus*. Sinaloa, Mexico; *Arceuthobium blumeri* and *A. globosum* subsp. *globosum*, Mexico.
- MISTLETOE, Dwarf. *Arceuthobium americanum*, Rocky Mt. states; Pacific Northwest; *A. campylopodum*, western dwarf, Rocky Mt. states to Pacific Coast, TX; *A. vaginatum*, southern Rocky Mt. states, Mexico; *A. vaginatum* subsp. *cryptopodum*, CO; *A. cyanocarpum*, CA, CO, OR, WY; *A. occidentale*, CA; *A. gilli*, AR; *A. vaginatum* subsp. *vaginatum*, AR; *A. hondurensis*, Mexico; Dwarf Mistletoe, *A. aureum* subsp. *aureum*, Mexico; *Cladocolea cupulata* on *P. duglasiana* and *P. herrarie*, Mexico (Durango and Sinaloa).
- NEEDLE CAST. *Bifusella linearis*, tar spot, widespread; *B. striiformis*, CA; *Elytroderma deformans*, also Witches' Broom, SD to AZ, CA, GA, WA; *Hypoderma desmazierii*; ME to NC, GA, WI; *H. hedgecockii*, Southeast; *H. lethale*, gray blight, on hard pines, New England to FL, LA; *H. pedatum*, CA; *H. pini*, CA, NV; *H. saccatum*, tar spot, CO, NM; *Hypodermella arcuata*, CA, OR; *H. ampla*, tar spot, Great Lakes states; *H. cerina*, CA; *H. concolor*, CO to ID, MT, OR; *H. lacrimiformis*, CA, OR; *H. limitata*, CA; *H. medusa*, CA, CO; *H. montana*, CA to ID, OR; *H. montivaga*, CA to MT, OR; *Lophodermium nitens*, New England to GA and MI and Pacific Northwest, on five-needle pines; *L. pinastri*, widespread; *L. ponderosae*, CA; *Canavirgella banfieldii*, MI.
- NEEDLE CAST. *Bifusella saccata*, CA, CO; *Hypodermella* sp., CA, OR; *Lophodermium durilabrum*, OR; *L. seditiosum*, MI.
- NEEDLE DROOP. Abiotic inability of poor roots to acquire sufficient water, MI, MN, WI.
- NEMATODE, Dagger. *Xiphinema americanum*.
- NEMATODE, Lance. *Hoplolaimus coronatus*.

- NEMATODE, Leaf. **Aphelenchoides fragariae**, FL.
- NEMATODE, Pinewood. **Bursaphelenchus xylophilus**, vectored by pine sawyer beetle, IL, MO; also **B. lignicolus**, MO.
- NEMATODE, Ring. **Criconemoides lobatum**; FL; **C. similis**, FL, NC.
- NEMATODE, Root Knot. **Meloidogyne** sp., NM; **Meloidodera javanica**, FL; **M. floridensis**, on slash pine, FL.
- NEMATODE, Sting. **Belonolaimus gracilis**.
- NONPARASITIC. **Ozone Injury**; **Sulfur Dioxide Injury**; IN, NJ, WI; **Needle Curl**. High temperature; **Chlorotic Dwarf**.
- ROT, Charcoal. **Macrophomina phaseoli**.
- ROT, Heart; Wood. **Fomes** spp., general; **Fomes annosus**; **Lentinus lepideus**, widespread; **Polyporus** spp., widespread; **Poria** spp., **Lenzites saepiaria**; **Stereum** spp.; **Trametes** spp., widespread.
- ROT, Hypocotyl. **Fusarium oxysporum**, CA; **F. oxysporum** var. **redolens**, MN, root lesions; **Longidorus** sp. (root damage and seedling stunting), GA.
- ROT, Root. **Armillaria mellea**, widespread; **A. gallica**, HI; **Ceratocystis wageneri**, OR, Pacific Northwest; **Clitocybe tabescens**, FL; **Cylindrocladium scoparium**, seedling blight, NJ, PA, WA; **C. clavatum**, FL; **Fusarium solani**, PA; **F. oxysporum**, PA; **F. avenaceum**, PA; **Phytophthora cactorum**, seedling blight, Northeast; **Phymatotrichum omnivorum**, TX; **Sparassis radicata**, MT to OR, WA; **Verticicladiella wagnerii**, CA, MT, western states; **V. procera**, FL, MN; **V. penicillata**, ID; **V. abietina**, ID.
- ROT, Root. **Fomes annosus**, VA, WI; **Polyporus schweinitzii**, VA; **Phytophthora parasitica** var. **nicotianae**, CA; **P. citricola**, CA; **P. dreschleri**, NC; **Iononutis circinatus**, FL.
- ROT, Root; Little Leaf. **Phytophthora cinnamomi**, NC, TN, VA, Dominican Republic.
- ROT, Root; blue-stain fungi associated with roots; **Leptographium terebrantis**; **L. procerum**; **Ophiostoma** sp., **Graphium** spp., AL, TX.
- ROT, White. **Amylostereum areolatum**, NY, eastern Canada.
- RUST. **Coleosporium crowellii**, CA, NV, UT, NV; **Melampsora laricipopulina** (0, I), WA; II, III, on poplar; **M. medusae** f. sp. **deltoidae** (0, I), WA; II, III, on poplar.
- RUST, Blister. **Cronartium ribicola**, AZ.
- RUST, Comandra Blister. **Cronartium comandrae** (0, I), swellings in twigs, trunks of hard pines; II, III on bastard toadflax, ND.
- RUST, Cone. **Cronartium conigenum**, hypertrophy of cones, especially in South; II, III on oak; **C. strobilinum**; II, III on evergreen oaks.
- RUST, Eastern Gall. **Cronartium quercuum**, galls on trunk, branches, witches' brooms on two- and three-needle pines East to Rocky Mts. especially Southeast; II, III on oak, rarely chestnut.
- RUST, Fusiform. **Cronartium fusiforme**, swellings in trunk, branches, in South; II, III on evergreen oaks; **Cronartium quercuum** f. sp. **fusiforme**, NC.
- RUST, Lodgepole Pine Blister; Western Fusiform. **Cronartium coleosporioides** (*Peridermium harknessi*) (0, I), swellings on twigs, branches; trunk cankers; widespread in West; II, III on painted-cup, birdbeak, owl-clover, wood-betony; **C. stalactiforme** (0, I); II, III on Indian paintbrush.
- RUST, Needle. **Coleosporium apocyanaceum** (0, I), Southeast; II, III on *Amsonia*; **C. asterum** (*C. solidaginis*) (0, I), on all two- and three-needle pines in eastern U.S., western form CO to MT, WA; II, III on aster, goldenrod, and other composites; **C. campanulae** (0, I), Northeast to IN, NC; (I, III on bellflower, loosestrife, Venus-looking-glass; **C. crowellii** (III), on pinon and limber pines, AZ, CO, NM; **C. delicatulum** (0, I), New England to FL and west to Great Plains; II, III on goldenrod; **C. elephantopodis** (0, I), NJ to FL, TX; II, III on *Elephantopus*; **C. helianthi** (0, I), NY to GA, OH; II, III on sunflower; **C. inconspicuum** (0, I), MD to GA, OH, TN; II, III on coreopsis; **C. ipomoeae** (0, I), NJ to FL, AZ, IL; II, III on morning-glory; **C. jonesii** (0, I), AZ, CO, NM; II, III on currant and gooseberry; **C. laciniariae**, NJ to FL; II, III on *Liatris*; **C. madaiae** (0, I), CA, OR; II, III on composites; **C. minutum** (0, I), on loblolly

and spruce pines, FL; II, III on *Forestiera*; **C. pinicola**, DE to NC, TN; **C. senecionis**, CO, RI; II, III on *Senecio*; **C. sonchiarvensis** (0, I), on Scotch pine, CT to NE; II, III on sow-thistle; **C. terebinthinaceae** (0, I), Southeast; II, III on *Parthenium* and *Silphium*; **C. vernoniae** (0, I), on two-and three-needle pines East and South; II, III on ironweed.

RUST, Pine-Pine Gall. **Endocronartium harknessii**, MN, MO, PA.

RUST, Piñon Blister. **Cronartium occidentale**.

RUST, Stem. **Cronartium appalachianum** (0, I), NC, TN, VA; II, III on *Buckleya*; **C. filamentosum**; **Peridermium weirii**.

RUST, Sweet-Fern Blister. **Cronartium comptoniae**, swellings on trunk and branches of two-and three-needle pines from northeast-ern to central and Great Lakes states; II, III on sweet-fern and sweet gale.

RUST, Western Gall. **Endocronartium harknessii**, VA, also twig necrosis and Witches' Broom, MA, ND.

RUST, White Pine Blister. **Cronartium ribicola** (0, I), swellings on trunk and branches of eastern white pine from New England to MN, NM, VA; on western white pine in Pacific Northwest; on sugar pine, CA; on limber pine, ND, SD, WY; II, III on gooseberry, currant, CA; on whitebark pine, CA, CO, NV; Mt. Rainier National Park and Crater Lake National Park.

SOOTY MOLD. **Fumago vagans**; **Capnodium pini**, widespread; **Scorias spongiosa**.

White pine blister rust is, of course, our foremost disease of pines, and full details are given under Rusts. Black currants are banned entirely in infected areas, red currants within 300 feet of pines. Of the other possible rusts on various pines, the only one seen in northern gardens is the aster rust (*Coleosporium asterum*), which is slightly disfiguring to the needles but not very damaging to general health. Fusiform rust is serious in the South. Brown needles may be due to one of the needle blights or needle cast fungi and also to winter drying. New shoots of Austrian pine turn brown from Diplodia tip blight, which should not be confused with the

common discoloration caused by the pine shoot moth.

VIRUS. **Tomato Spotted Wilt**, GA (in *P. elliotii*, *P. taeda*, *P. palustris*).

WITCHES' BROOM. **Elytroderma deformans**, CA.

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## Pineapple (*Ananas*)

BACTERIAL, Yeast Disease. **Klebsiella** sp., **Candida** sp., Brazil.

NEMATODE, Lesion. **Pratylenchus brachyurus**.

NEMATODE, Root Knot. **Meloidogyne** sp., FL.

NONPARASITIC. **Spike**, Long Leaf, FL.

ROT, Leaf Base; White Leaf Spot. **Ceratocystis paradoxa**, FL.

VIRUS. **Pineapple Wilt-Associated**, HI.

WILT. Toxic effect of mealybug feeding.

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## Pipsissewa (*Chimaphila*)

LEAF SPOT. **Mycosphaerella chimaphilina**, NY, OR, PA, WA; **Septoria chimaphilae**, DE.

RUST. **Pucciniastrum pyrolae** (II, III), NY to NC, CA, MT, OR, TN, WA, WI.

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## Pistachio (*Pistacia*)

BLIGHT, ROT ROOT. **Rhizoctonia solani**, CA.

BLIGHT, Shoot. **Botrytis cinerea**, CA; **Sclerotinia sclerotiorum**, CA; **Botryosphaeria rhodina**, CA; **Fusicoccum** (formerly *Botryosphaeria*).

BLIGHT, Thread. **Pellicularia koleroga**, FL, TX.

LEAF SPOT. **Phyllosticta lentisci**, TX; **Septoria pistaciarum**, AZ, NM, TX; **Alternaria** sp., NM.

LEAF SPOT, BROWN. **Microascus cirrhosis**, Iran.

NEMATODE. **Meloidogyne** sp., CA; **Xiphinema index**, CA.

ROT, Root. **Phymatotrichum omnivorum**, AZ, CA, TX.

ROT, Sapwood. *Pleurotus ostreatus*, CA;  
*Schizophyllum commune*, CA.  
 WILT. *Verticillium albo-atrum*, CA.

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### Pitcher-Plant (*Sarracenia*)

BLIGHT, Southern. *Sclerotium rolfsii*, TX.  
 LEAF SPOT. *Colletotrichum gloeosporioides*, NJ,  
 TX; *Helminthosporium sarraceniae*, second-  
 ary, MN; *Mycosphaerella sarraceniae*, GA,  
 ME, MI, MN, MS, NY, PA, SC; *Pestalotia*  
*aquatica*, secondary, MD, MN.  
 ROT, Root. *Pythium graminicola*, NC; *Rhizoc-*  
*tonia solani*, TX.

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### Pithecellobium (Blackbead, Catsclaw)

BLIGHT, Twig. *Phomopsis* sp., FL.  
 LEAF SPOT. *Colletotrichum erythrinae*, TX;  
*Pestalotia funerea*, TX; *Phyllosticta*  
*pithecolobii*, TX.  
 NEMATODE. *Meloidogyne* sp.  
 RUST. *Ravenelia gracilis* (0, I, II, III), TX; *R.*  
*pithecolobii* (II, III); *R. siderocarpi* (II, III),  
 TX.

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### Pittosporum

BLIGHT, Southern; Wilt. *Sclerotium rolfsii*, FL, TX.  
 BLIGHT, Thread. *Pellicularia koleroga*, LA; *Rhi-*  
*zoctonia ramicola*, FL.  
 LEAF SPOT, Angular. *Cercospora pittospori*, FL,  
 LA, SC to TX; *Phyllosticta* sp., AL;  
*Alternaria tenuissima*, FL.  
 NEMATODE, Root Knot. *Meloidogyne* sp.  
 ROT, Foot. *Diplodia* sp., FL.  
 ROT, Root. *Phymatotrichum omnivorum*, TX.  
 VIRUS. Mosaic, undetermined, CA; Rough Bark,  
 undetermined, CA; Variegation. Variegated  
 forms may be due to a virus.  
 WILT. *Verticillium albo-atrum*, CA.

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### Plane-Tree, Sycamore (*Platanus*) (American Sycamore, *P. occidentalis*; California Sycamore, *P. racemosa*; London Plane, *P. acerifolia*; and Oriental Plane, *P. orientalis*)

ANTHRACNOSE; Leaf and Twig Blight. *Gnomonia*  
*platani* (*G. veneta*, *Gloeosporium platani*, *G.*  
*nervisequum*), general.  
 BACTERIAL SCORCH. Xylem limited Rickettsialike  
 bacteria, DC, LA, TX.  
 BLIGHT, Leaf. *Phloeospora multimaculans*, IN,  
 TX.  
 BLIGHT, Twig; Canker. *Massaria platani*, CA,  
 GA, IN, IA, KS, NJ.  
 CANKER. *Dothiorella* sp., NY; *Botryodiplodia*  
*theobromae*, MS; *Hypoxylon tinctor*, GA,  
 LA, NC.  
 CANKER Stain; London Plane Blight. *Ceratocystis*  
*fimbriata* f. sp. *platani*, DE, MD, MS, MO, NJ,  
 NY, NC, OH, PA, TN, VA, WV.  
 LEAF SPOT. *Cercospora platanicola*  
 (*Mycosphaerella platanifolia*) NC to GA, IA,  
 TX; spermatial stage is *Phyllosticta platani*;  
*Mycosphaerella stigmata-platani*, NC;  
*Septoria platanifolia*, GA, IA, MD, SC, TX,  
 WV; *Stigmella platani-racemosae*, CA;  
*Cristutariella pyramidalis*, FL; *Tubakia*  
*dryina*, LA.  
 MISTLETOE. *Phoradendron serotinum*  
*(flavescens)*, AZ, NM, OK, TN, TX.  
 NONPARASITIC. Rosy canker. Illuminating gas in  
 soil, MD, NJ, NY.  
 Decline. Moisture deficiency, MS.  
 POWDERY MILDEW. *Microsphaera alni*, wide-  
 spread; *Oidium obductum*, PA, VA, WV;  
*Phyllactinia corylea*, IN.  
 ROT, Heart, Trunk. *Fomes* spp.; *Steccherinum*  
*(Hydnum) erinaceus*, some-times on living  
 trees.  
 ROT, Root. *Armillaria mellea*, MD, TX, WV;  
*Phymatotrichum omnivorum*, AZ, TX;  
*Phytophthora cinnamomi*, MD; *Clitocybe*  
*tabescens*, CA; *C. olearia*.  
 ROT, Wood. *Daedalea* spp., widespread; *Sterum*  
 spp.; *Polyporus* spp.

The canker stain of London plane and American sycamore flared up in epidemic form around Philadelphia in 1935, killing thousands of street and ornamental trees from Newark to Baltimore before it was learned the fungus was spread in pruning and in tree paint as well as by certain beetles. Pruning is now restricted to winter months, and a disinfectant is added to the wound dressing. Sycamore anthracnose is serious in wet seasons, particularly when the mean daily temperature for 2 weeks after bud-break is below 55 °F.

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### Plantain, Common (*Plantago*)

VIRUS. **Tomato Ringspot**, PA; **Plantago Mottle**, NY; **Ribgrass Mosaic**, NY.

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### Platycodon (Balloon-Flower)

BLIGHT. **Phytophthora cactorum**, MN.  
 ROT, Root. **Rhizoctonia solani**, CT, PA;  
**Phymatotrichum omnivorum**, TX.

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### Plum (Garden), Prune (*Prunus domestica*)

BACTERIAL Crown Gall. **Agrobacterium tumefaciens**, widespread.  
 BACTERIAL Fire Blight. **Erwinia amylovora**, occasional, OR, WA.  
 BACTERIAL Leaf Spot; Black Spot. **Xanthomonas pruni**, eastern and southern states to WI, TX.  
 BACTERIAL Shoot Blight; Gummosis. **Pseudomonas syringae**, CA.  
 BLACK KNOT. **Dibotryon morbosum**, widespread except far West.  
 BLIGHT, Blossom, Twig. **Monilinia laxa**, CA, OR, WA; **Botrytis cinerea**.  
 BLIGHT, Thread. **Pellicularia koleroga**, LA.  
 BLIGHT, Twig. **Diplodia** spp., secondary.  
 BLOTCH, Leaf. **Phyllosticta congesta**, GA, TX.  
 BLOTCH, Sooty; Flyspeck. **Zygophiala cryptogama**, **Z. wisconsinensis**, **Pseudocercospora** sp., **Stomiopeltis** spp., IA.

CANKER. **Phytophthora cactorum**, CA, IN;  
**Ceratocystis fimbriata**, CA; **Valsa (Cytospora) leucostoma**, dieback, widespread.

LEAF CURL; Witches Broom. **Taphrina** spp., occasional; **T. communis**, plum pockets;  
**T. pruni**, pockets, bladder plums;  
**T. insititiae**.

LEAF SCORCH. **Xylella fastidiosa**, Southern CA.

LEAF SPOT; Shot Hole. **Cercospora circumscissa**, CA, FL, MA, TX, WA;  
**Coccomyces prunophorae**, widespread;  
**Coryneum carpophilum**, CA to ID and WA;  
**Phyllosticta circumscissa**, IA, WA;  
**Septoria pruni**, TX.

MISTLETOE. **Phoradendron serotinum (flavescens)**, TX; **Viscum album**, CA, on *Prunus salicina* ("Santa Rosa" Plum).

NEMATODE, Lesion. **Pratylenchus pratensis**;  
**P. vulnus**.

NEMATODE, Root Knot. **Meloidogyne** spp., FL, TX.

NONPARASITIC. **Brown Bark Spot**. Arsenical poisoning, MT.

**Chlorosis**. Alkaline soil, mineral deficiency, CA, FL.

**Exanthema**. Copper deficiency, CA, FL.

**Gum Spot**, Drought Spot. Irregular water supply, NY, Pacific Northwest.

**Little Leaf**. Zinc deficiency, CA, OR, WA.

**Marginal Scorch**. Fluorine injury, WA.

**Myrobalan Asteroid Spot**. Cause unknown, occasional.

**Myrobalan Mottle**. Genetic abnormality, occasional in seed stocks.

**Wind Scab**. Caused by developing fruit rubbing against other fruit, leaves and shoots during strong wind, CA.

POWDERY MILDEW. **Podosphaera oxycanthae** var. **tridactyla**, occasional.

POX, Plum. NY, PA.

ROT, Brown; Blossom Blight. **Monilinia fructicola**, general; **M. laxa**, MA, NY, RI.

ROT, Fruit. **Alternaria** sp., OR; **Botrytis cinerea**, CA, WA; **Cladosporium** sp., ID, OR;  
**Lambertella pruni**, CA.

ROT, Heart. **Fomes applanatus**, OR; **F. fulvus**, widespread; **Lenzites saepiaria**, Pacific



Northwest; **Polyporus hirsutus**;  
**P. versicolor**, wide-spread.

ROT, Pink Mold. **Trichothecium roseum**, CA.

ROT, Root. **Armillaria mellea**, widespread;  
**Phymatotrichum omnivorum**, TX.

ROT, Silver Leaf. **Stereum purpureum**, WA.

RUST. **Tranzschelia discolor** (II, III), widespread,  
especially in South and Pacific Coast states; 0,  
I on anemone; **T. pruni-spinosae** (II, III); 0, I,  
on anemone, hepatica, thalictrum, buttercup.

SCAB. **Cladosporium carpophilum**, widespread.

VIRUS. **Plum Line Pattern**; **Plum White Spot**;  
**Prune Diamond Canker**; **Prune**  
**Constricting Mosaic**; **Prune Dwarf**; **Cherry**  
**Vein Clearing**; **Little Peach**; **Peach Mosaic**;  
**Peach Rosette**; **Peach Yellows**; **Ring Spot**;  
**Plum Rusty Blotch**; **Apricot Ring Pox**; **Stem**  
**Pitting**; **Cherry Green Ring Mottle**, North  
America.

WILT; Seedling Black Heart. **Verticillium albo-**  
**atrum**.

Plums are even more subject to brown rot than  
peaches and take the same spray schedule. This  
includes insect control to avoid infection through  
feeding injuries. Black knot is sometimes con-  
spicuous on twigs, but diseased portions can be  
pruned out and a dormant lime-sulfur spray  
applied.

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### Plum, Wild (*Prunus americana*)

BLOTCH Sooty. **Zygophiala jamaicensis**, IA.

FLYSPECK, Fruit. **Pseudocercospora** spp.

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### Plumegrass (*Erianthus*)

ANTHRACNOSE. **Colletotrichum falcatum**, LA.

ERGOT. **Claviceps purpurea**, AL, OK.

LEAF SPOT; Mold. **Cladosporium erianthi**, SC;  
**Curvularia** sp., FL; **Helminthosporium** sp.,  
FL; **Phyllachora erianthi**, tar spot, AL, FL,  
GA, SC.

RUST. **Puccinia virgata** (II, III), GA; **P. polysora**  
(II, III), 0, I unknown.

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### Plumeria (*Frangipani*)

LEAF SPOT. **Cercospora plumeriae**, FL.

MISTLETOE. **Phoradendron serotinum**  
(**flavescens**), FL.

ROT, Root. **Phymatotrichum omnivorum**, TX.

RUST. **Coleosporium domingense** (II, III), FL;  
**C. plumeriae**, HI, LA.

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### Podocarpus

NEMATODE, Buttowing. **Rodopholus similis**, FL.

ROT, Root. **Clitocybe tabescens**, FL.

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### Poinciana (*Caesalpinia*)

ANTHRACNOSE. **Gloeosporium** sp., FL.

BACTERIAL Crown Gall. **Agrobacterium**  
**tumefaciens**, FL.

ROT, Root. **Clitocybe tabescens**, FL;  
**Phymatotrichum omnivorum**, TX.

RUST. **Ravenelia humphreyana** (II, III), FL.

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### Poinsettia (*Euphorbia pulcherrima*)

BACTERIAL Bract Spot. **Clavibacter cassiicola**, FL.

BACTERIAL Canker; Leaf Spot. **Clavibacter**  
**poinsettiae**, MD, NJ, NY, PA; **Pseudomonas**  
**viridiflava**, CA, FL.

BACTERIAL, Greasy Canker. **Pseudomonas**  
**viridiflava**, CA, FL.

BACTERIAL Leaf Spot. **Xanthomonas**  
**poinsetriaecola**, FL.

BACTERIAL Stem Rot. **Erwinia carotovora** pv.  
**chrysanthemi**, CT, MI, OH, PA, WV.

BLIGHT, Tip; Stem Canker. **Botrytis cinerea**,  
MO, TX, WA.

CANKER, Stem. **Fusarium solani**, WI.

LEAF SPOT. **Cercospora pulcherrimae**, TX;  
**Corynespora cassiicola**, LA.

NEMATODE, Root Knot. **Meloidogyne** sp., NY;  
**M. incognita**.

NONPARASITIC. **Chlorosis**. Possibly due to cloudy  
weather.

**Stunt.** Waterlogged soil.

POWDERY MILDEW. *Oidium* sp., CA.

ROT, Crown and Stem. *Phytophthora nicotianae* var. *parasitica*, FL.

ROT, Root. *Chalaropsis thielaviopsis*, IL; *Clitocybe tabescens*, FL; *Phymatotrichum omnivorum*, AZ, TX; *Rhizoctonia solani*, FL, IL, NJ, TX; *Thielaviopsis basicola*, serious, common; *Pythium aphanidermatum*, PA; *P. irregulare*, PA; *P. ultimum*, PA.

ROT, Stem; Wilt. *Fusarium* sp., FL, NJ; *Pythium debaryanum*, OK; *P. perniciosum*, root rot, CA; *P. ultimum*; *Phytophthora* sp., NJ; *Sclerotinia sclerotiorum*, WA; *Amphobotrys ricini*, basal, LA.

RUST. *Uromyces euphorbiae* (0, I, II, III), OK, TX.

SPOT ANTHRACNOSE; Poinsettia Scab. *Sphaceloma poinsettiae*, FL.

VIRUS. *Poinsettia Mosaic*, WI.

Keep soil acid, pH 4.8 to 5, to reduce trouble with *Thielaviopsis*. *Rhizoctonia* is prevalent at high temperatures, *Pythium* at low. Steaming soil is safer than using chemicals.

### Poison Hemlock (*Conium*)

VIRUS. *Alfalfa Mosaic*, WA; *Clover Yellow Vein*, WA; *Apium Virus Y*, WA.

### Poison Ivy (*Rhus radicans* = *Toxicodendron radicans*)

BLIGHT, Twigs. *Botryopheria obtusa*.

CANKER, Limbs and Trunk. *Valsa ceratosperma*, GA.

LEAF SPOT. *Alternaria* sp. WV; *Cercospora* sp., FL; *Stigmina pallida*, CO, TX; *Colletotrichum* sp., CA; *Discosia artocress*, MS; *Gleosporium toxicotrichum*, eastern states, KS, MS, MT, OK; *Phoma* sp., NC; *Phyllosticta rhoicola*, MS, NY, TX, WA, WV; *Phyllosticta toxicodendri*, SC; *Phyllosticta* sp., WI; *Septoria rhoina*, ID; *Tubakia dryina*, IL.

ON LEAVES. *Cristulariella moricola*, AL, GA; *Collectogloem rhois*, NJ.

POWDERY MILDEW. *Phyllatinia gutata*, WA, MI.

RUST. *Pileolaria brevipes*, AZ; *Pileolaria effusa*, AZ.

STEMS. *Discosia rhoina*, CO, IL, NJ; *Discosia toxica*, CO, IL, NJ; *Botrydiplodia compressa* f. *toxicodendrum*, NY.

TRUNKS and WOOD. *Bjerkandera adusa*, MD, WV; *Daedaleopsis confragosa*, NC; *Dendrophora albobadia*, GA; *Perenniporia medulla-panis*, MI; *Phellinus gilvus*, MD; *Schizophyllum commune*, VA; *Trametes hirsute*, MD; *Trametes versicolor*, MD, ND; *Dothidea puccinoides*, GA; *Diaporthe spiculosa*, IL, MA, NJ, NY; *Hainesia lythri*, WI; *Hypoxylon rubiginosum*, GA; *Rhytidhysteron rufulum*, GA.

### Poison Oak (*Toxicodendron diversilobum*, West Coast and *Toxicodendron pubescens*, East Coast)

BLIGHT, Leaves. *Cristulariella moricola*, GA; *Colletogloem rhois*, NJ; *Phyllosticta toxica*, IA, IL, MS, SC, WV.

BLIGHT, Stems. *Diaporthe peckii*, NJ; *Botrydiplodia compressa* f. *toxicodendron*, NY; *Dothiorella radicans*, CO, IL, NJ; *Dothiorella rhoina*, CO, IL, NJ; *Dothiorella toxica*, CO, IL, NJ.

LEAF SPOT. *Stigmina pallid*, CO, ID, TX; *Discosia artocreas*, MS; *Gleosporium toxicodendri*, eastern states, KS, MS, MT, OK; *Phyllosticta rhoicola*, MS, NY, TX, WA, WV; *Phyllosticta toxicodendri*, SC; *Septoria rhoina*, ID; *Tubakia dryina*, IL.

POWDERY MILDEW. *Phyllactinia guttata*, WA.

ROT, Decline. *Hypoxylon rubiginosum*, GA; *Valsa ceratosperma*, GA; *Pileolaria effusa*, AZ, CO; *Stereum hirsutum*, NC.

ROT, Limb. *Diaporthe spiculosa*, IL; *Rhytidhysteron rufulum*, GA.

ROT, Root. *Dasyscyphus corticalis*, WA.

ROT, Trunk. *Bjerkanderea adusta*, MD, WV.

ROT, Wood. *Dendrophora albobadia*, GA; *Perenniporia medulla commune*, MI; *Schizophyllum commune*, VA; *Trametes versicolor*, MD, NC.

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**Poison Sumac (*Rhus radicans* = *Toxicodendron vernix*)**

- BLIGHT, Canker. *Botryosphaeria obtuse*, KS, MI, SC.
- BLIGHT, Canker and Dieback. *Amphiporthes aculens*, eastern states, IA, GA.
- BLIGHT, Stem. *Diaporthe peckii*, MI.
- LEAF SPOT and DIEBACK. *Discohainesia oenotherae*, eastern states, WV; *Cercospora toxicodendri*, DE; *Pseudocercospora rhoina*, WI.
- POWDERY MILDEW. *Sphaerotheca macularis*, eastern and central states.
- ROT, Limbs. *Dendrophora albobadia*, GA.
- ROT, Root. *Phymatotrichopsis omnivora*, TX.
- ROT, Trunk. *Bjerkandera adusta*, Range of Host; *Irpex lacteus*, Range of Host; *Phellinus gilvus*, MI; *Schizophyllum commune*, Range of Host; *Steccherinum ochraceum*, PA; *Steccherinum ochraceo-flaveum*, MD; *Trametes hirsuta*, Range of Host; *Trametes versicolor*, Range of Host; *Trichapnum bifforme*, Range of Host.

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**Polemonium (Jacobs-Ladder, Greek-Valerian)**

- LEAF SPOT. *Cercospora omphakodes*, PA; *Septoria polemonii*, MO, WI; *S. polemonicola*, CT, IN, MO.
- POWDERY MILDEW. *Golovinomyces cichoracearum*, UT; *Sphaerotheca macularis*, WA.
- RUST. *Puccinia gulosa* (III), CA; *P. polemonii* (III), CA, ID, IN; *Uromyces acuminatus* var. *polemonii* (0, I), IL, IN, IA, WI.
- VIRUS. *Tomato Spotted Wilt*, PA.
- WILT. *Fusarium* sp., NJ; *Verticillium albo-atrum*, NJ.

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**Pomegranate (*Punica granatum*)**

- ANTHRACNOSE; Fruit Spot. *Colletotrichum* sp., FL.

- BLIGHT, Thread. *Pellicularia koleroga*, FL.
- BLOTCH, Leaf; Fruit Spot. *Mycosphaerella lythracearum*, FL to MS, TX.
- DECAY. *Pilidiella granati*, CA.
- NEMATODE. *Meloidogyne* sp., FL.
- ROT, Fruit. *Alternaria* sp., CA; *Aspergillus niger*, AZ, CA, TX; *Botrytis cinerea*, gray mold, cosmopolitan; *Nematospora coryli*, dry rot, CA; *Penicillium expansum*, blue mold, cosmopolitan; *Coniella granati*, NC.
- ROT, Root. *Clitocybe tabescens*, FL; *Phymatotrichum omnivorum*, TX.
- SPOT ANTHRACNOSE. *Sphaceloma punicae*, FL, LA, TX.

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**Pond-Spice (*Litsea*)**

- LEAF SPOT. *Cercospora olivacea*, GA.

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**Poplar, Aspen, Cottonwood (*Populus*)**

- BACTERIAL Limb Gall. *Agrobacterium tumefaciens*, CT, IA, MN, NE, TX.
- BACTERIAL Wetwood. *Clavibacter humiferum*.
- BLIGHT, LEAF. *Linospora tetraspora*, WA.
- BLIGHT, Shoot. *Venturia populina* (*Didymosphaeria populina*), Northeast to WI; *V. tremulae*; *Colletotrichum gloeosporioides*, PA; *Glomerella cingulata*, WA, and leaf.
- BRONZE LEAF DISEASE. *Apioplagiostoma populi*, Alberta, Canada.
- CANKER, Branch and Trunk. *Dothichiza populea*, most serious on Italian varieties, widespread; *Hypoxyton pruinaum*, Southwest, Northeast and Great Lakes states, AZ, CA; *Nectria cinnabarina*; *N. galligena*; *Dothiora polyspora*, CO, NM, UT.
- CANKER; DIEBACK. *Botryosphaeria ribis* var. *chromogena*, widespread, especially in the South; *Cytospora chrysosperma* (*Valsa sordida*); prevalent on ornamental poplars; *Valsa nivea*; *Ceratocystis tremululo-aurea*, Rocky Mts.; *C. fimbriata*, MN, PA; *Fusarium* (*Hypomyces*) *solani*, IA; *Phomopsis*

- macrospora**, MS; **Ceratocystis** sp., Rocky Mts., MN, PA on aspen; **Septoria musiva**, Alberta and British Columbia, Canada on poplar.
- CANKER, Sooty Bark. **Cenangium singulare**, Rocky Mts.
- LEAF BLISTER, Yellow. **Taphrina aurea**, SC; **T. populina**, MS, New England to Great Lakes states; **T. johansonii**, catkin deformity, widespread; **T. populi-salicis**, CA, OR.
- LEAF BLOTCH. **Septotinia populiperda**, ME, MD, MA, NY, VT.
- LEAF BRONZE. **Apioplagiostoma populi**, Manitoba, Canada.
- LEAF SPOT. **Marssonina** spp., widespread; **Mycosphaerella** (*Septoria*) **populicola**; **M. populorum** (*Septoria musiva*), also twig canker. **Phyllosticta** spp.; **Cercospora populina**, AL, LA, MO; **C. populicola**, TX; **Stigmina populi**, DE; **Marsonina brunnea**, WA and central U.S.; **Septoria populicola**, WA.
- LEAF SPOT; Ink Spot. **Ciborinia bifrons** (*Sclerotinia whetzellii*) in Northeast; **C. confundens** (*Sclerotinia bifrons*), CO to WY, OR, WA.
- MISTLETOE. **Phoradendron serotinum** (**flavescens**), AZ, NM, TX, **P. macrophyllum**
- MISTLETOE, European. **Viscum album**, CA, on *Populus Fremontii* (Fremont Cottonwood) and *P. tremuloides* (Quaking Aspen)
- NEMATODE, Dagger. **Xiphinema americanum**, SD, on cottonwood.
- NEMATODE, Ring. **Criconemoides crotaloides**.
- NONPARASITIC. **Chlorosis**. Iron deficiency, WY.
- POWDERY MILDEW. **Uncinula salicis**, widespread; **Golovinomyces cichoracearum**, UT.
- ROT, Heart. **Daedalea** spp., sometimes on living trees; **Fomes igniarius**, widespread; **F. pini**; **Pholiota adiposa** and **P. destruens**, New England states.
- ROT, Root. **Armillaria mellea**, occasional; **Phymatotrichum omnivorum**, OK, TX; **Cylindrocladium scoparium**, of seedlings, GA.
- ROT, Wood. **Collybia velutipes**, sometimes living trees, Rocky Mt. states; **Fomes** spp.; **Polyporus** spp.; **Lenzites saepiaria**, widespread.
- ROT, Wound. **Schizophyllum commune**, cosmopolitan.
- RUST, Leaf. **Melampsora bietis-canadensis** (II, III), New England to Great Plains; 0, I on hemlock; **M. albertensis** (II, III), CA, MT, NM; 0, I on Douglas-fir; **M. larici-populina** (II, III), WA, Quebec, Canada, Eastern North America; **M. medusae** (II, III), through U.S. except far South; 0, I on larch; **M. populnea** (III), CO, RI, Pacific Coast; **M. occidentalis** (II, III), MT to CA, IA, WA, WI; 0, I unknown.
- SPOT ANTHRACNOSE. **Sphaceloma populi**, OK.
- VIRUS. **Poplar Decline**; **Poplar Mosaic**.
- Cytospora canker is rather common on poplars lacking in vigor, but the Rio Grande cottonwood in the West is resistant. Avoid wounding, prune out twigs that have died back, and promote better growing conditions. Dothichiza canker may kill Lombardy poplars. Seriously diseased trees should be destroyed.
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- ### Poppy (*Papaver*)
- ANTHRACNOSE. **Gloeosporium** sp. (*Glomerella cingulata*), NJ.
- BLIGHT, Bacterial. **Xanthomonas papavericola**, CT, ME, MO, NJ, NY, OH, OR, VA.
- BLIGHT, Gray Mold. **Botrytis cinerea**, AK, MD, WI.
- LEAF SPOT; Pod Spot. **Cercospora papaveri**, AL, FL, TX; **Septoria** sp., IA.
- NEMATODE, Leaf. **Aphelenchoides fragariae**, NJ.
- NEMATODE, Root Knot. **Meloidogyne** sp.
- POWDERY MILDEW. **Erysiphe polygoni**, OR; **Leveillula taurica**, CA.
- ROT, Root, Stem; Damping-Off. **Rhizoctonia solani**, ID, IN, KS, ME, NJ, NY.
- SMUT, Leaf. **Entyloma fuscum**, IA, ME, TX.
- VIRUS. **Beet Curly Top**, TX; **Tomato Spotted Wilt**, CA.
- WILT. **Verticillium albo-atrum**, NY.
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- ### Poppy-Mallow (*Callirhoë*)
- BROOMRAPE. **Orobanche ramosa**, TX.
- LEAF SPOT. **Cercospora althaeina**, IL, KS, NE, WI; **Vermicularia spar-sipila**, TX.

ROT, Root. **Phymatotrichum omnivorum**, TX.

RUST. **Endophyllum tuberculatum** (III), IN, KS, NE, OK, TX; **Puccinia interveniens** (0 I), NE, NY, TX; II, III on Stipa; **P. schedonnardi**, CO, KS, NE, OK, TX, UT.

WILT. **Verticillium albo-atrum**, NY.

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## Portulaca

BLIGHT, Stem. **Dichotomophthora indica**, VA.

DAMPING-OFF. **Rhizoctonia solani**, IL; **Helminthosporium (Bipolaris) portulacae**, NC.

NEMATODE, Root Knot. **Meloidogyne** sp., AL.

ROT, Black Stem. **Dichotomophthora portulacae**, CA, TX.

VIRUS. **Beet Curly Top**, CA; **Tomato Spotted Wilt**, NY.

WHITE RUST. **Albugo portulacae**, MT to GA, MT, TX.

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## Potato (*Solanum tuberosum*)

ANTHRACNOSE; Black Dot Disease.

**Colletotrichum atramentarium** (*C. coccodes*), probably general after wilt; **Gloeosporium** sp., IN, OH.

BACTERIAL Blackleg. **Erwinia carotovora** pv. **atroseptica**, general.

BACTERIAL Canker. Vascular. **Clavibacter michiganense**, WY.

Also on *Solanum ciliatum*, *S. gilo*, *S. guineense*, *S. khasianum*, *S. nigrum*, *S. atropurpureum*, *S. aviculare*, *S. carolinense*, *S. indicum*, *S. nodiflorum*, *S. quitoense*.

BACTERIAL, MLO. **Aster Yellows**, AR, Purple-Top.

BACTERIAL Ring Rot. **Clavibacter sepedonicum**, general.

BACTERIAL Soft Rot. **Erwinia carotovora** and **E. ardoideae**, cosmopolitan in transit and market.

BACTERIAL Wilt. **Pseudomonas solanacearum**, chiefly in the South; **Ralstonia solanacearum**, race 3, biovar 2, WI.

BLIGHT, Early. **Alternaria solani**, general.

BLIGHT, Foliar. **Phytophthora nicotianae**, FL, MO, NE, TX.

BLIGHT, Late. **Phytophthora infestans**, general, common in Northeast, Middle Atlantic and North central states, occasional elsewhere, AK, FL.

BLIGHT, Southern. **Sclerotium rolfsii**, NC to FL, AZ, OH.

BLOTCH, Leaf. **Cercospora concors**, GA, IN, MI, NY.

DODDER. **Cuscuta** sp., DE, NE, NJ, WA.

LEAF SPOT. **Ascochyta lycopersici**, OR.

NEMATODE, Golden. **Heterodera rostochiensis (Globodera rostochiensis)**, DE, NY, Quebec, Canada.

NEMATODE, Lesion. **Pratylenchus brachyurus; P. scribneri; P. negelectus; P. penetrans**, NY; **P. penetrans** and **Verticillium dahliae**, interaction (stunting and rot), WA.

NEMATODE, Pale Cyst. **Globodera pallida**, ID.

NEMATODE, Ring. **Criconemoides mutabile**.

NEMATODE, Root Knot. **Meloidogyne** spp., general; **M. arenaria; M. chitwoodi**, CO, TX, WA, Pacific Northwest; **M. hapla**, Pacific Northwest.

NEMATODE, Sting. **Belonolaimus gracilis; B. longicaudatus**.

NEMATODE, Stubby-root. WA.

NEMATODE, Tuber. **Ditylenchus destructor**, ID.

NONPARASITIC. **Black Heart**. Oxygen deficiency. **Blackening after Cooking**. Drought, heat, deficient light during tuber growth; potassium deficiency, chilling.

**Blackening before Cooking**. Mechanical injury.

**Checking**. Skin rough, scurf. Partly fertilizer injury, alkalinity.

**Chlorosis**; Tip blight, boron deficiency; Leaf drop, magnesium deficiency.

**Dimple**. Depression at bud end and **Dimple skin**, pits. Cause unknown.

**Elephant Hide**. Fertilizer burn, on Russet Burbank.

**Fasciation** (tubers and aerial parts). Probably genetic.

**Giant Hill**. Over-sized, late-maturing plants. Genetic factors.

**Glassy End**. Starch deficiency; high water content.

- Growth Cracks.** Fluctuating moisture.
- Hollow Heart.** Excessive soil moisture and fertility.
- Hopperburn.** Marginal necrosis from leafhoppers. General.
- Internal Brown Spot.** Various physiological factors.
- Knobbiness,** “second growth”. Extreme fluctuations of soil moisture.
- Lenticel Enlargement.** Wet soil or oxygen deficiency.
- Mahogany Browning.** Low temperature, ME.
- Marginal Browning,** bronzing. Potassium deficiency.
- Ozone.** Purple-black specks from air pollution.
- Pitting,** Spot necrosis of tubers. Oxygen deficiency in storage.
- Pointed Ends.** Irregular growth conditions.
- Psyllid Yellows.** Insect injury, western states.
- Ring Spot.** Zonate, depressed lesions. Cause unknown.
- Scald of tubers.** Overheating, sunburn, frequent in South.
- Spraying.** Internal concentric necrosis. TRV or PMTV Virus.
- Sprout Tubers;** “Little Potato”. Overheating in storage; planting in dry, cold soil.
- Stem-End Browning.** Vascular necrosis. Virus.
- Stem Necrosis;** Defoliation. Manganese toxicity in acid soil.
- Tipburn.** Abrupt transition from cool, moist to hot, dry weather, general.
- PHYTOPLASMA, Aster Yellows. **Candidatus Phytoplasma asteris,** NE, TX.
- PHYTOPLASMA. **Potato Purple Top,** MT, Canada, Mexico, Russia, U.S.
- PHYTOPLASMA, Zebra Chip Disease. **Candidatus Liberibacter psyllaourous,** CA, Honduras, Mexico; **C. L. solanacearum,** AZ, CA, CO, KS, NE, NV, NM, TX. Central America, Guatemala, Mexico.
- POWDERY MILDEW. **Golovinomyces cichoracearum,** CA, KY, NJ; **Oidium** sp.; MD, NJ, OH, PA, UT, western U.S.; **Leveillula taurica,** WA.
- ROT, Charcoal. **Macrophomina phaseoli,** CA, GA, IL, OK, TX.
- ROT, Collar. **Fusarium solani** f. sp. **eumartii,** CA.
- ROT, Dry. **Fusarium graminearum,** ND; **F. torulosum,** **F. oxysporum** and **F. sambucinum,** MI.
- ROT, Gray Mold; Shoot Blight. **Botrytis cinerea,** AK, CT, ID, ME, OH.
- ROT, Pink, Watery. **Phytophthora erythroseptica,** DE, ID, LA, ME, MA, OK, PA; **P. parasitica,** TX; **P. cryptogea,** TX.
- ROT, Root. **Armillaria mellea,** CA, FL, MI, OR, WA, WI, WY; **Phymatotrichum omnivorum,** TX; **Helicobasidium purpureum,** MA, MT, NE, NY, ND, OK, OR, TX, WA; **Fusarium solani** f. sp. **eumartii,** CA.
- ROT, Silver Scurf. **Spondylocladium atrovirens,** general but less frequent in the South; **Helminthosporium solani,** NY.
- ROT, Stem. **Sclerotinia** sp., FL, ME, SC; **S. minor,** CA; **S. sclerotiorum,** FL, MA, MT, NY, OR, TX, WA, general.
- ROT, Tuber. **Aspergillus niger;** **Fusarium** spp.; **F. solani,** jelly end-rot; **Gliocladium** sp., secondary; **Oospora pustulans,** skin spot; **Penicillium** spp., blue mold; **Phoma tuberosa;** **Phomopsis tuberivora;** **Phytophthora drechsleri,** **P. nicotianae,** FL, MO, NE, TX; **Rhizopus** spp.; **Trichothecium roseum,** pink mold; **Xylaria apiculata.**
- ROT, Tuber Sprout. **Fusarium sambucinum,** MI.
- ROT, Watery Leak. Chiefly **Pythium debaryanum,** common in West; **Pythium** spp.
- SCAB. **Streptomyces scabies,** general; Powdery Scab, **Spongopora subterranea,** AK, ND; Russet Scab, **Streptomyces** sp.
- VIRUS. **Apical Leaf Roll,** unidentified; **Potato Aucuba Mosaic,** NY; **Potato Calico** strain of **Alfalfa Mosaic;** **Potato Crinkle;** **Mild Mosaic** (Virus X plus A); **Green Dwarf;** **Beet Curly Top;** **Potato Leaf Roll,** general; **Potato Leaf Rolling Mosaic;** **Mottle** (Potato Virus X); **Potato Rugose Mosaic** (Potato Virus Y), general; **Potato Virus Y,** Mexico; **Potato Spindle Tuber** (viroid), general; **Potato Vein Banding;** **Potato Witches’ Broom;** **Potato Yellow Dwarf;** **Potato Yellow Spot;** **Tobacco Ring Spot;** **Potato Corky Ring Spot** (Tobacco Rattle), MI, MN, ND,

WI; **Potato Virus M**; **Potato Virus S**, general; **Tobacco Veinal Necrosis**, Pacific Northwest; **Potato Virus A**, WA; **Tomato Spotted Wilt**, NC, TX; **Potato Mop-Top**, ME, ND, WA; **Impatiens Necrotic Spot**, NY, WA; **Potato Yellowing**, Ecuador.

WART, Potato. **Synchytrium endobioticum**, MD, PA, VA; see under ► **Galls**; Prince Edward Island, Canada.

WILT. **Verticillium albo-atrum**, widespread.

WILT; Stem-end Rot. **Fusarium** spp.; **F. oxysporum**, general but more frequent East and South.

Potato growing is a highly specialized business not well adapted to most small gardens. Use certified seed, resistant varieties where possible. Control insects spreading virus diseases.

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### Potentilla (*Cinquefoil*)

DOWNY MILDEW. **Peronospora potentillae**, IA, NJ, TX.

LEAF SPOT. **Fabraea dehnii**, IA, NY, VT; **Marssonina potentillae**, CA, CO, MA, MI, NM, NY, WI; **Phyllosticta anserinae**, IL; **Ramularia arvensis**, WI.

POWDERY MILDEW. **Erysiphe polygoni**, CO; **Sphaerotheca macularis**, CO, WI.

RUST. **Phragmidium andersonii** (I, II, III), general.

VIRUS. **Tomato Ringspot**, NY.

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### Pothos (*Epipremnum*)

ROT, Petiole, Leaf, Crown. **Phytophthora capsici**, MA.

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### Pothos, Ivy-Arum (*Scindapsus*)

BACTERIAL Blight. **Pseudomonas cichorii**, FL.

NEMATODE, Burrowing. **Radopholus similis**, FL.

NEMATODE, Lesion. **Pratylenchus** sp.

NEMATODE, Root Knot. **Meloidogyne arenaria thamesi**; **M. incognita**.

ROT, Root. **Pythium splendens**, FL; **Rhizoctonia** sp., foot rot, MO.

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### Prenanthes (Rattlesnake-Root)

DOWNY MILDEW. **Bremia lactucae**, IA, MA, MN. GALL, Leaf. **Synchytrium aureum**, WI.

LEAF SPOT. **Cercospora brunnea**, AR, NC, WI; **C. prenanthis**, AL, IN, KS; **C. tabacina**, WI; **Laestadia prenanthis**, AL; **Septoria nabali**, NY to IA, WI, ME to VA.

POWDERY MILDEW. **Golovinomyces cichoracearum**, IL, MD, NC, PA; **Sphaerotheca macularis**, NY to AL, IL, MN, OH, PA.

RUST. **Puccinia atropuncta** (0, I), PA, VA; II, III on *Amianthium*; **P. dioicae** (0, I), IL, MN, NY, VA, WI; II, III on *Carex*; **P. insperata** (I, II, III), OR; **P. orbicula** (0, I, II, III), ME to TN, ND.

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### Prickly-Ash (*Xanthoxylum americanum*)

CANKER, Stem. **Diplodia natalensis**, TX.

LEAF SPOT. **Cercospora xanthoxyli**, IN, TX; **Septoria pachyspora**, IA, NE.

POWDERY MILDEW. **Phyllactinia corylea**, widespread.

ROT, White Heart. **Fomes ignarius**.

RUST. **Puccinia andropogonis** var. **xanthoxyli** (0, I), IA, KS, MO, NE, TX, WI; II, III on *Andropogon*.

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### Prickly-Poppy (*Argemone*)

DOWNY MILDEW. **Peronospora arborescens**, TX.

LEAF SPOT. **Alternaria lancipes**, KS, TX; **Gloeosporium argemonis**, KS, TX; **Septoria argemones**, NE, OK, TX.

ROT, Root. **Phymatotrichum omnivorum**, TX.

RUST. **Aecidium plenum** (0, I), TX.

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### Primrose (*Primula*)

BACTERIAL Leaf Spot. **Pseudomonas primulae**, CA.

BACTERIAL, MLO. **California Aster Yellows**.

BLIGHT, Gray Mold. *Botrytis cinerea*, frequent in greenhouses, occasional in gardens.

LEAF SPOT. *Ascochyta primulae*, WI; *Asteroma garretianum*, black spot, CO, UT; *Cercospora primulae*, WA; *Colletotrichum primulae*, FL; *Mycosphaerella* sp., AZ; *Ramularia primulae*, CA, CT, DE, NY.

NEMATODE, Leaf and Stem. *Ditylenchus dipsaci*, CA, MD, PA.

NEMATODE, Root Knot. *Meloidogyne* spp., occasional in greenhouses.

NONPARASITIC. Chlorosis. Excessive soil acidity or iron or magnesium deficiency.

POWDERY MILDEW. *Erysiphe polygoni*, CT, NJ, VA.

ROT, Root. *Pythium irregulare*, CA; *Rhizoctonia solani*, FL, IL, TX; *Phymatotrichum omnivorum*, TX.

ROT, Stem. *Alternaria* sp., CT; *Sclerotinia sclerotiorum*, MD.

RUST. *Puccinia aristidae* (0, I), ME; *Uromyces apiosporus*, CA, NV.

VIRUS. Primrose Mosaic; Cucumber Mosaic; Tobacco Necrosis; Tomato Spotted Wilt; *Impatiens* Necrotic Spot, NC.

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### Privet (*Ligustrum*)

ANTHRACNOSE; Canker; Dieback. *Glomerella cingulata*, general, especially on common privet.

BACTERIAL Crown Gall. *Agrobacterium tumefaciens*, occasional.

BLIGHT, Leaf. *Ramularia* sp., NJ, WA.

BLIGHT, Thread. *Pellicularia koleroga*, FL.

DODDER. *Cuscuta* sp., FL.

GALL. *Phomopsis* sp., MD, TX; *P. ligustri-vulgaris*, blight, PA; *Phoma* sp., TX.

LEAF SPOT. *Cercospora adusta*, DE to AL, TX; *C. ligustri*, Gulf states; *Exosporium concentricum*, TX; *Phyllosticta ovalifolii*, MD, MS, TX; *Corynespora cassicola*, FL.

LEAF SPOT, Algal. *Cephaleuros virescens*, Gulf states.

NEMATODE, Leaf. *Aphelenchoides fragariae*.

NEMATODE, Root Knot. *Meloidogyne* spp., southern states.

NONPARASITIC. Chlorosis. Manganese deficiency, FL.

PARASITIC Lichen. *Strigula elegans* and *S. complanata*, southern U.S., GA.

POWDERY MILDEW. *Nicrosphaeria alni*, IN, LA, NJ, OH, on *Ligustrum japonicum* (Wax-leaf Ligustrum).

ROT. *Rosellinia necatrix*, CA; *Ganoderma applanatus*, collar rot.

ROT, Root. *Armillaria mellea*, AR, CA, MS, TX; *Clitocybe monadelpa*, AR; *C. tabescens*, FL; *Phymatotrichum omnivorum*, AZ, OK, TX.

ROT, Wood. *Stereum hirsutum*, cosmopolitan; *Polyporus versicolor*, cosmopolitan.

SOOTY MOLD. Common after whiteflies in the South.

VIRUS. Variegation. Graft transmitted. Chlorotic Spot, LA; *Ligustrum* Line Pattern, AR.

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### Prunella (Self-Heal, Heal-All)

BLIGHT, Southern. *Sclerotium rolfsii*, TX.

LEAF SPOT. *Gibberidea abundans*, tar spot, ME, WA; *Linospora brunellae*, AK, ID, WA; *Phyllosticta brunellae*, TX; *Ramularia brunellae*, IL, IN, NY, OH, TX, VA, WI; *Septoria brunellae*, general.

POWDERY MILDEW. *Golovinomyces cichoracearum*, PA; *Sphaerotheca macularis*, IL, IN, MD, MS, WA, WI.

ROT, Root. *Pythium palingenes*; *P. polytylum*, VA.

VIRUS. Tomato Ringspot, VT.

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### Pulmonaria

ROT, Petiole. *Sclerotium rolfsii* var. *delphinii*, IA.

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### Pumpkin

► Squash



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### Puncture Vine (*Tribulus*)

VIRUS. **Tomato Spotted Wilt**, General.

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### Pyracantha (Firethorn)

BACTERIAL Fire Blight. *Erwinia amylovora*, widespread.

BLIGHT, Leaf. *Fabraea maculata*, LA.

BLIGHT, Silky Thread. *Rhizoctonia ramicola*, FL.

BLIGHT, Twig. *Diplodia crataegi*, PA.

CANKER, Felt Fungus. *Septobasidium cokeri* and *S. mariani*, on bark scales.

CANKER; DIEBACK. *Botryosphaeria ribis*, LA.

MISTLETOE, European. *Viscum album*, CA.

ROT, Root. *Armillaria mellea*, CA; *Phymatotrichum omnivorum*, TX.

SCAB. *Fusicladium pyracanthae*, widespread on leaves and fruit.

WILT. *Fusarium oxysporum*, FL.

Fire blight is the most common disease. It infects all species, but some are relatively resistant. Scab, often disfiguring on berries, can be prevented by spraying at bud-break and 10 and 20 days later.

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### Pyrethrum (*Chrysanthemum cinerariifolium*, *C. coccineum*)

BACTERIAL Fasciation. *Clavibacter fascians*, CT, MD.

BACTERIAL, MLO. **Aster Yellows**, KS, NJ, NY.

BLIGHT, Gray Mold. *Botrytis cinerea*, PA.

DAMPING-OFF. *Gloeosporium* sp., PA; *Pythium* sp., root rot, CO.

NEMATODE, Root Knot. *Meloidogyne* sp.

ROT, Root. *Phymatotrichum omnivorum*, TX; *Rhizoctonia solani*, NJ.

ROT, Stem. *Sclerotinia sclerotiorum*, VA.

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### Pyrola (Shinleaf)

BLIGHT, Gray Mold. *Botrytis cinerea*, MD.

LEAF SPOT. *Mycosphaerella chimaphilae*, MI; *Ovularia pyrolae*, WI; *Ramularia pyrolae*,

WI; *Phyllosticta pyrolae*, DE, MT, WI; *Septoria pyrolae*, MI.

RUST. *Chrysomya pirolata* (II, III), general from ME to MN and from MT to CA, AK; 0, I on spruce; *Pucciniastrum pyrolae* (II, III), general in West.

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### Queen Anne's Lace, False (*Ammi majus*)

VIRUS. **Mosaic, Clover Yellow Vein Potyvirus**, FL.

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### Quince (*Cydonia*)

ANTHRACNOSE, Northwestern. *Neofabraea malicorticis*, OR, WA.

BACTERIAL Crown Gall. *Agrobacterium tumefaciens*, general.

BACTERIAL Fire Blight. *Erwinia amylovora*, general.

BACTERIAL Hairy Root. *Agrobacterium rhizogenes*, ME to NC; Pacific Coast.

BLIGHT, Dothiorella Twig. *Botryosphaeria ribis*, TX.

BLIGHT, Leaf; Black Spot. *Fabraea maculata*, general.

BLIGHT, Thread. *Pellicularia koleroga*, NC, Gulf states.

CANKER, Perennial. *Neofabraea perennans*, OR.

CANKER, Trunk. *Nectria galligena*, OR; Twig, *Valsa leucostoma*.

FRUIT SPOT. *Leptothyrella pomi*, MO; *Mycosphaerella pomi*, New England to OH.

LEAF SPOT. *Phyllosticta* sp., DE.

NEMATODE, Root Knot. *Meloidogyne* sp., TX.

POWDERY MILDEW. *Phyllactinia corylea*, VA; *Podosphaera leucotricha*, CA, WA; *P. oxycanthae*, NY, WV to IN.

ROT, Bitter; Canker. *Glomerella cingulata*, eastern and central states southward.

ROT, Black; Canker; Leaf Spot. *Physalospora obtusa*, eastern states to AL, TX.

ROT, Brown. *Monilinia fructicola*, eastern states, MS, OR, TX; *M. laxa*, also blossom and twig blight, Pacific Coast.

ROT, Fruit. **Alternaria mali**, IN; **Botrytis cinerea**, occasional; **Cephalothecium roseum**, pink mold, occasional; **Penicillium expansum**, cosmopolitan; **Phoma cydoniae**, pale rot, IL, MI; **P. mali**, IN.

RUST. **Gymnosporangium clavariiforme** (0, I), leaves, fruit, stems, CT, ME, NH; III on juniper; **G. clavipes** (0, I), orange rust, quince rust, on fruit, stems; III on juniper; **G. gracile** (0, I); III on juniper; **G. libocedri** (0, I), fruit, stems, OR; III on incense-cedar; **G. nelsonii** (0, I), leaves, stems, AZ, CO; III on juniper; **G. nidus-avis** (0, I), leaves, fruit, stems, CT, NY; III on juniper.

SCAB. **Venturia pirina**, CT.

SPOT ANTHRACNOSE. **Elsinoë piri**, WA.

Quinces are subject to fire blight; infected branches should be cut out with the usual precautions. For leaf blight, spray when blossoms show pink, again when last of the petals are falling, and perhaps twice more at 2-week intervals. Brown rot is not very important on quince. To prevent rust, remove nearby susceptible junipers or spray them in spring as spore horns are developing on galls. See under ► [RUSTS](#).

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### Quince, Flowering, Japanese, Chinese (*Chaenomeles*)

BACTERIAL Crown Gall. **Agrobacterium tumefaciens**, occasional.

BACTERIAL Fire Blight. **Erwinia amylovora**, occasional.

BLIGHT, Leaf. **Fabraea macula**, AL, CT, NJ, NY.

CANKER, Felt Fungus. **Septobasidium burtii**, MS; **S. mariani**, NC.

CANKER, Twig Blight. **Botryosphaeria ribis**, AL, TX; **Phoma** sp., MD, TX; **Physalospora obtusa**, TX, eastern states.

FRUIT SPOT. **Mycosphaerella pomi**, IL, MD, also leaf blotch.

LEAF SPOT. **Cercospora cydoniae**, AL, GA.

NEMATODE, Root Knot. **Meloidogyne** sp.

ROT, Brown. **Monilinia fructicola**, leaf blight, MI; **M. laxa**, also blossom and twig blight, CA.

RUST, Quince. **Gymnosporangium clavipes** (0, I), on stems; CT, NJ; III on juniper; **G. libocedri** (0, I), on leaves; III on incense-cedar.

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### Rabbitbrush (*Chrysothamnus*)

LEAF SPOT. **Phloeospora bigeloviae**, CA.

POWDERY MILDEW. **Golovinomyces cichoracearum**, CA, MT, UT, WY; **Erysiphe polygoni** var. **sepulta**, CO, MT, UT, WY.

RUST. **Puccinia dioicae** (0, I), NM and CA; **P. grindeliae** (III), MT to NM, CA; **P. stipae** (0, I), MT to NM, CA; II, III on grasses.

SMUT, Inflorescence. **Thecaphora pilulaeformis**, AZ.

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### Radish (*Raphanus*)

BACTERIAL Black Rot. **Xanthomonas campestris**, IN, IA, MI, NJ, NY, OH, PA, TX.

BACTERIAL, Phytoplasma. **California Aster Yellows**, CA; **Virescence**, ID, WA.

BACTERIAL Soft Rot. **Erwinia carotovora**, cosmopolitan.

BACTERIAL Spot. **Xanthomonas vesicatoria** pv. **raphani**, IN; **Xanthomonas campestris** pv. **armoraciae**, OH.

BLOTCH; Black Pod. **Alternaria raphani**, CA, MI, MN, NJ, OH, PA.

CLUB ROOT. **Plasmodiophora brassicae**, occasional in North, MA to NJ, MN, WA.

DAMPING-OFF. **Pythium debaryanum**, MA, MN, NJ, WY; **Rhizoctonia solani**, cosmopolitan.

DOWNY MILDEW. **Peronospora parasitica**, northeastern and central states to MS, CA, TX.

LEAF SPOT. **Alternaria brassicae**, gray leaf spot, CA; **A. oleracea**, black leaf spot, CT, NJ; **Cercospora cruciferarum**, AL, IL, MO, TX; **C. atrogrisea**, NJ.

NEMATODE, Leaf and Stem. **Ditylenchus dipsaci**, NY.

NEMATODE, Root Knot. **Meloidogyne arenaria**; **M. javanica**, AL, MS, OR, PA, TX.

NONPARASITIC. Air Pollution. NO<sub>2</sub>, O<sub>3</sub>, SO<sub>2</sub>, NC.

POSTHARVEST, Black Patch. **Alternaria raphani**, St. Catharines, Canada.

POWDERY MILDEW. *Erysiphe polygoni*, CA, MO, TX.

ROT, Black Root. *Aphanomyces raphani*, ME to FL, CA, IA, OK, OR; *Pythium aphanidermatum*, IN, KS, MA, MI, NY, OH, OK, PA, SC, WI.

ROT, Crown, Watery Soft. *Sclerotinia sclerotiorum*, CA, IN, MN, NJ, TX.

ROT, Pod. *Phoma lingam*, CA, FL.

ROT, Root. *Ascochyta* sp.; *Phymatotrichum omnivorum*, TX.

RUST. *Puccinia aristidae* (0, I), AZ, CO.

SCAB. *Streptomyces scabies*, IN, MI, NJ, OH, TX, WI.

SCAB, Acid. *Streptomyces acidiscabies*, ME.

VIRUS. **Radish Mosaic; Beet Curly Top; Tobacco Streak, CA; Tomato Spotted Wilt** (on wild radish), GA.

WHITE RUST. *Albugo candida*, general.

WILT; Yellow. *Fusarium oxysporum* f. sp. *raphani*; *F. oxysporum* f. sp. *conglutinans*, CA.

Radishes are so easily grown in home gardens that not many gardeners worry about disease control. Seed should, however, be treated for damping-off and root rots.

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### Ragweed (*Ambrosia*)

BACTERIAL Blight. *Pseudomonas syringae* pv. *tagetis*, WI.

DOWNY MILDEW. *Plasmopara halstedii*, ND.

GALLS, Stem. *Protomyces gravidus*, LA.

LEAF SPOT. *Phoma* sp.

ROT, ROOT. *Rhizoctonia solani*, TX.

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### Rain-Lily (*Cooperia*)

LEAF SPOT. *Cercospora amaryllidis*, TX.

RUST. *Puccinia cooperiae* (0, I, II, III), TX.

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### Rambutan (*Nephelium lappaceum*)

CANKER, Stem. *Dolabra nepheliae*, HI, Puerto Rico.

ROT, Fruit. *Gliocephabotrichum simplex*, HI; *G. bulbilium*, HI; *Lasmenia* sp., HI, Puerto Rico; *Pestalotiopsis virgatula*, HI.

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### Ranunculus (Buttercup, Crowfoot)

BACTERIAL, MLO. **California Aster Yellows.**

BACTERIAL NECROTIC LESION, LEAF, STEM. *Xanthomonas campestris*, CA.

BLIGHT, Gray Mold. *Botrytis cinerea*, CA, NY, WI.

DOWNY MILDEW. *Peronospora ficariae*, occasional MA to MD, IA, MN; also CA.

GALL, Leaf. *Synchytrium anomalum*, IA; *S. aureum*, CA, IL, WI; *S. cinnamomeum*, WI.

LEAF SPOT. *Ascochyta infuscans*, WI; *Cercospora ranunculi*, IA, WI; *Cylindrosporium ficariae*, WA; *Didymaria didyma*, IL, IN, IA, MA, MI, MS, NY, WI; *Fabraea ranunculi*, CA, NE, NY, WI; *Ovularia decipiens*; *Ramularia aequivoca*, IL, IA, OR, WI; *R. didyma*, CA; *Septocylindrium ranunculi*, IL, NY, WA, WI; *Septoria* sp.

NEMATODE, Leaf and Stem. *Ditylenchus dipsaci*, OR.

POWDERY MILDEW. *Erysiphe polygoni*, frequent in eastern and central states; *Sphaerotheca macularis*, CO.

ROT, Leaf. *Ceratobasidium anceps*, WI.

ROT, Root. *Phymatotrichum omnivorum*, TX.

ROT, Stem. *Sclerotinia sclerotiorum*, AZ, CA; *Pythium* sp., CA; *Sclerotium rolfsii*, CA.

RUST. *Puccinia andina* (III), IL, IN; *P. eatoniae* var. *ranunculi* (0, I), CT to SC, CA, CO, MS, ND; II, III, on *Sphenopholis*; *P. ranunculi* (III), AZ, CO, UT, WA, WY, *P. recondita* (0, I), WI to TX, CA, WA; III on *Hordeum*; *Uromyces dactylidis* (0, I), CO, MA, TX; *U. jonesii* (0, I, III), CA, CO, MT, WY.

SMUT, Leaf. *Doassansia ranunculina*, IN, WI; *Urocystis anemones*, IL, UT, WY.

SMUT, White. *Entyloma microsporium*, IL, IN, IA, KY, VA, WI; *E. ranunculi*.

VIRUS. **Beet Curly Top; Ranunculus Mottle; Ranunculus Mosaic; Impatiens Necrotic Spot, NC; Tomato Spotted Wilt, PA.**

## Raspberry (*Rubus*)

ANTHRACNOSE; DIEBACK; Gray Bark.

**Gloeosporium allantosporum**, OR, WA.

BACTERIAL Blossom Blight. **Pseudomonas** sp., OR.

BACTERIAL Crown Gall. **Agrobacterium tumefaciens**, general; **A. rubi**, cane gall, NY, PA to IL, OR, WI.

BACTERIAL Fire Blight; Flower and Twig Blight. **Erwinia amylovora**, ME, NH, PA, WA, WI.

BACTERIAL Hairy Root. **Agrobacterium rhizogenes**, OR.

BACTERIAL, Witches' Broom. **MLO**, OR.

BLIGHT, Cane. **Leptosphaeria coniothyrium**, general; **Physalospora obtusa**, IA, MD, MI, MO, ND; **Sclerotinia** sp., NY.

BLIGHT, Spur. **Didymella applanata**, general.

CANKER; Cane Spot. **Ascospora ruborum**, MA, OR, WI.

CANKER; DIEBACK. **Glomerella cingulata**, AR, KY, MD, MI, MO, NJ, OH, RI, WV; **G. rubicola**, white bud, IL, NJ; **Botryosphaeria ribis**, FL; **Macrophoma rubi**, IL.

DODDER. **Cuscuta gronovii**, CT, IL, WI.

DOWNY MILDEW. **Peronospora rubi**, WA.

FRUIT SPOT, FLYSPECK. **Leptothyrium pomi**, IN, KY, MA.

LEAF SPOT. **Cylindrosporium rubi** (*Sphaerulina rubi*), also cane spot, common East of Rocky Mts.; **Mycosphaerella confusa** (*Cercospora rubi*), NJ to FL, IL, TX; **M. rubi**, general; **Pezizella oenotherae**, MD, MO, VA; **Septoria darrowi** (perhaps same as *Cylindrosporium rubi*) **Stigmatea rubicola**, black leaf and cane spot, MT, NM, NY, VT, WI.

NEMATODE, Lesion. **Pratylenchus vulnus**.

NEMATODE, Sheath. **Hemicycliophora** sp.

NONPARASITIC. **Chlorosis**. Iron deficiency in West.

POWDERY MILDEW. **Phyllactinia corylea**, MI; **Sphaerotheca macularis**, Northeast, Northwest, CA, IL, MN.

ROSETTE, Double Blossom. **Cercosporiella rubi**, IL, KY, MD, NY, PA.

ROT, Fruit. **Botrytis cinerea**, gray mold, cosmopolitan; **Phyllostictina carpogena**, MD; **Monilinia fructicola**, brown rot, IL; **Alternaria** sp., MA; **Rhizopus nigricans**, black mold, cosmopolitan.

ROT, Root. **Armillaria mellea**, OR, WA; **Rhizoctonia solani**, CO, ID, WA; **Xylaria** sp., WA; **Phytophthora erythroseptica**, Pacific Northwest; **P. rubi**, WA; **Pratylenchus penetrans**, WA.

RUST, Late. **Pucciniastrum americanum** (II, III), Northeast to ID, IL, NC, OH; 0, I on spruce.

RUST, Leaf. **Phragmidium rubiidae** (0, I, II, III), northeastern and central states to CO; Pacific Northwest.

RUST, Orange. **Gymnoconia peckiana** (0, I, III), on black raspberry, Northeast to MN, Pacific Northwest; **Kunkelia nitens** (I), IL, IN, MI, OH.

RUST, Yellow. **Kuehneola uredinis** (0, I, II, III), IL, PA, DE to WI.

SPOT ANTHRACNOSE. **Elsinoë veneta**, general but less common on red than black raspberry.

VIRUS. **Raspberry Leaf Curl**; **Red**; **Black Raspberry Necrosis**, TN; **Raspberry Streak**; **Raspberry Yellow Mosaic**, general; **Tomato Ring Spot**, cause of crumbly fruit, NY; **Tobacco Ring Spot**, NC; **Raspberry Bushy Dwarf**, OH; **Black Raspberry Witches' Broom Phytoplasma**, OR; **Crumbly Fruit Disease**, OR; **Rubus Yellow Net**, Alberta, Canada; **Blackberry Chlorotic Ringspot**, OR, WA.

WILT. **Verticillium albo-atrum**, MA to NJ, OH, OR, WA.

Virus diseases are important on raspberries and cannot be controlled by spraying. Purchase healthy plants and set, if possible, 500 feet away from old patches. Inspect at least three times the first year, roguing all diseased plants, after first searing them with a blow torch or flame thrower so aphids will not carry the virus to nearby healthy bushes. Plants seldom recover from *Verticillium* wilt and never from orange rust, which is systemic. Crown gall is important on red

raspberries; if infected plants are found, raspberries should not be replanted in the same soil for several years.

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### Ratibida (Prairie Coneflower)

DOWNY MILDEW. *Plasmopara halstedii*, IA.

LEAF SPOT. *Cercospora ratibida*, KS, WI; *Physalospora lepachydis*, MT; *Ramularia rudbeckiae*, ID; *Septoria infusata*, MI, MO, WI.

POWDERY MILDEW. *Golovinomyces cichoracearum*, ND, TX.

ROT, Violet Root. *Helicobasidium purpureum*, TX; *Phymatotrichum omnivorum*, TX.

RUST. *Uromyces perigynius* (0, I), ND, TX; II, III on *Carex*.

SMUT, White. *Entyloma compositarum*, NE, MI to IN, KS, MN.

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### Rattan Vine (*Berchemia*)

RUST. *Puccinia coronata* (0, I), VA to LA; II, III on oats and wild grasses.

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### Redbud, Judas-Tree (*Cercis*)

CANKER; DIEBACK. *Botryosphaeria ribis* var. *chromogena*, DE, MD, NJ, NC, TX, VA.

DODDER. *Cuscuta exaltata*, TX.

DOWNY MILDEW. *Plasmopara cercidis*, TN.

LEAF SPOT. *Cercospora cercidis*, OK; *Cercospora chionea*, IL, IN, KS, NC; *Mycosphaerella cercidicola*, general; *Phyllosticta cercidicola*, IN, WV; *Pestalotia guepini*, IL.

ROT, Root. *Phymatotrichum omnivorum*, TX; *Polyporus lucidus*, VA.

ROT, Wood. *Polyporus adustus*; *P. versicolor*; *Ganoderma lucidum* (*Polyporus lucidus*).

VIRUS. Yellow Ringspot, OR.

WILT. *Verticillium* sp., OH; of seedlings; *V. albo-atrum*, DC, VA; *V. dahliae*, DC; *Cylindrocladium* sp.

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### Red-Bay, Swamp-Bay (*Persea borbonia*)

BLACK MILDEW. *Asterina delitescens*, VA to FL, TX; *Irenopsis martiniana*, AL, MS, TX; *Lembosia rugispora*, MS, NC; *Meliola amphitricha*, FL, MS; *Englerula carnea*, FL.

LEAF SPOT. *Cercospora purpurea*, GA to FL, MS; *Phyllosticta micropuncta*, MD to FL, TX; *Pestalotia* spp., general.

LEAF SPOT, Algal. *Cephaleuros virescens*, Gulf states.

ROT, Wood. *Polyporus hirsutus*; *P. mutabilis*.

WILT, Laurel. *Raffaelea albidum*, MS; *R. lauricola*, MS.

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### Redweed (*Melochia*)

CANKER, Stem. *Diaporthe phaseolorum* var. *caulivora*, LA.

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### Rhexia (Deergrass, Meadow-Beauty)

LEAF SPOT. *Cercospora erythrogena*, AL DE, MS, TN; *Colletotrichum rhexiae*, DE; *Phyllosticta rhexiae*, FL.

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### Rhodesgrass (*Chloris gayana*)

LEAF STRIPE, Culm Stripe. *Helminthosporium hawaiiense*, FL.

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### Rhododendron

BACTERIAL Crown Gall. *Agrobacterium tumefaciens*, OH.

BACTERIAL Leaf Spot. *Pseudomonas cichorii*, GA.

BLIGHT. *Phytophthora ramorum*, CA, NC, OR, WA; *P. tropicalis*, VA.

BLIGHT, Bud, Twig. *Briosia azalea*, GA, NJ, NY, NC, PA, TN, VA.

- BLIGHT, Cutting. **Cylindrocladium scoparium** and **C. floridanum**, FL, OH.
- BLIGHT, Flower Spot. **Ovulinia azaleae**, CA, SC.
- BLIGHT, Gray. **Pestalotia macrotricha**, general after winter injury.
- BLIGHT, Necrotic Shoots and Leaves. **Phytophthora irrigate** and **P. hydropathica**, MD, PA, VA, WV.
- BLIGHT, Silky Thread. **Rhizoctonia ramicola**, FL.
- BLIGHT, Twig. **Phomopsis** sp., CT, NJ, NY, OR; **Phytophthora hedraiandra**, PA.
- CANKER; DIEBACK. **Botryosphaeria ribis**, MD, MA, NJ, NY; **Gloeosporium** sp., MD, NY; **Phytophthora cactorum**, MD, MA, NJ, NY, OH, PA, RI; **P. hedraiandra** (also leaf lesions), MN; **Glomerella cingulata**, MD; **Phytophthora cambivora**, NC.
- DAMPING-OFF. **Alternaria** sp., CT; **Rhizoctonia solani**, CT, NJ, NY.
- DODDER. **Cuscuta gronovii**, NJ.
- GALL. **Exobasidium vaccinii**, leaf and shot, MA to FL, MS; **E. burtii**, yellow leaf spot, NJ; **E. vaccinii-uliginosae**, Witches' Broom, NJ.
- LEAF SPOT. **Cercospora handelii**, FL, NJ, NC, VA; **Coryneum rhododendri**, NC, PA, TN, VA; **Cryptostictis mariae**, KY, NY, TN, VA; **Discosia artocreas**, secondary, MD, NY; **Guignardia rhodoraе**, CT, MD, MA, NJ, NY, PA, VA; **Gloeosporium ferrugineum**, NC; **Hendersonia concentrica**, NC, TX, WV; **Lophodermium schweinitzii**, NY to NC, TX; **Pestalopezia rhododendri**, TN, WV; **Mycosphaerella clintoniana**, NJ, NY, NC, OR, WA; **Phyllosticta rhododendri**, NJ; **Physalospora rhododendri**, PA, TN, VA; **Phomopsis rhododendri**, NJ; **Septoria rhododendri**, ME, NC; **S. solitaria**, NJ; **Venturia rhododendri**, MD, VA; **Phytophthora inflata**, OH; **P. insolita**, OH.
- LEAF SPOT, Tar. **Melasmia rhododendri**, AK.
- NONPARASITIC. **Chlorosis**. Mineral deficiency, usually iron, widespread.
- Sunscald**; Windburn. Severe winter injury in exposed locations.
- Walnut Toxicity**. Poisoning by root emanation from *Juglans nigra*.
- POWDERY MILDEW. **Microsphaera alni**, MD, NJ, NY; **Erysiphe azalea** and **E. vaccinii**, Pacific Northwest.
- ROT, Heart; Wood Rot. **Fomes annosus**, NC.
- ROT, Root. **Armillaria mellea**, CA, NJ, NY; **Phymatotrichum omnivorum**, TX.
- RUST. **Chrysomyxa ledi** var. **rhododendri**, CA, WA; **C. roahnensis** (II, III), NC, TN; 0, I on spruce; **C. piperiana** (II, III), CA, OR, WA; **Pucciniastrum vaccinii** (II), CT, NJ, RI.
- SPOT ANTHRACNOSE. **Sphaceloma** sp., WA.
- VIRUS. **Rhododendron Necrotic Ringspot**, OR.
- WILT. **Phytophthora cambivora**, NC; **P. cinnamomi**, MD, NJ, NY, PA, OH, VA; **P. citricola**, OH, VA; **P. cactorum**, VA; **P. citrophthora**, VA; **P. nicotianae**, VA; **P. tropicalis**, VA; **P. hibernalis**.
- Most rhododendron leaf spots are not worth worrying about. Some come after winter injury; some are definitely parasitic but not serious. Winter and early spring sun will turn some of the foliage brown. Do not prune out supposedly dead twigs and branches too soon; wait for new growth to start. An accumulation of matted wet leaves around the trunk fosters root and collar rot. Be cautious in the use of aluminum sulfate to acidify soil; sulfur is somewhat safer.
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- Rhoeo**
- VIRUS, **Tobacco Mosaic**, MD.
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- Rhubarb (*Rheum*)**
- ANTHRACNOSE. **Colletotrichum** sp., IL, MO, PA, WV, WI.
- BACTERIAL Crown Gall. **Agrobacterium tumefaciens**, IA, MA, NY.
- BACTERIAL Soft Rot. **Erwinia carotovora**, occasional in market; **E. rhapontici**, crown rot, OK.
- BLIGHT, Southern. **Sclerotium rolfsii**, FL, MS, TX, VA.
- DAMPING-OFF; Crown Rot. **Pythium** spp., CA, MD.
- DOWNY MILDEW. **Peronospora rumicis**, CA.

LEAF SPOT. *Ascochyta rhei*, eastern and central states to MS, KS; *Alternaria* sp., CA, MN, NE, NJ, PA; *Cercospora* sp., DE, MD, NE; **C. rhapontici**, IL; *Cladosporium* sp., CA, WA; *Macrophoma straminella*, general; **Ramularia rhei**, CA; *Septoria rhapontici*, IA.

NEMATODE, Root Knot. *Meloidogyne* spp., CA, MD, NY, OK.

NONPARASITIC. Crack Stem. **Boron Deficiency**, WA.  
ROT, Gray Mold. *Botrytis cinerea*, serious in greenhouses.

ROT, Root. *Armillaria mellea*, CA, TX; **Phymatotrichum omnivorum**, AZ, TX; **Phytophthora cactorum**, crown rot, CA, MO, OK, PA; **P. parasitica**, IL, KS, LA, MD, MO, NY, TX, VA; *Rhizoctonia solani*, CA, CT, IL, MN, MO, NY, OK, TX, WA.

RUST. *Puccinia phragmitis* (0, I), CA, MN, NE; II, III on *Phragmites*.

VIRUS. **Rhubarb Chlorotic Ring**; **Turnip Mosaic**, AK; **Beet Curly Top**.

Macrophoma leaf spot is common but seldom calls for control measures beyond removal of old stalks in late fall. Plants with crown rot should be dug and burned.

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### Ribbon-Bush (*Homalocladium*)

POWDERY MILDEW. *Erysiphe polygoni*, NY, PA, WI.

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### Ribbon-Grass (*Phalaris*)

ERGOT. *Claviceps purpurea*, NY.

LEAF BLOTCH (SPOT). *Stagonospora foliicola*, PA.

LEAF SPOT. *Helminthosporium catenarium*, PA on Reed Canary grass (*P. arundinacea*)

LEAF SPOT, Zonate Eye-Spot. **Helminthosporium giganteum**, MD.

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### Rice (*Oryza sativa*) Cereal Grass

BLIGHT, Panicle. *Burkholderia glumae* and **B. gladioli**, Southern U.S., Panama.

LEAF, Blast. *Pyricularia grisea*, AR.

LEAF Streak, White. *Mycovellosiella oryzae*, TX.  
SMUT, False. *Ustilagoidea virens*, LA.

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### Rice-Paper Plant (*Tetrapanax*)

NEMATODE, Root Knot. *Meloidogyne* sp., FL.

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### Rock-Jasmine (*Androsace*)

DOWNY MILDEW. *Peronospora candida*, KS.

LEAF SPOT. *Mycosphaerella primulae*, NM.

RUST. *Puccinia volkartiana* (III), AK.

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### Rock-Rose (*Cistus*)

ROT, Root. *Armillaria mellea*.

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### Rohdea

VIRUS. **Tomato Spotted Wilt**, PA.

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### Rollinia

DIEBACK, Fruit Rot. *Glomerella cingulata*, FL.

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### Romanzoffia

RUST. *Puccinia romanzoffiae* (III), OR.

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### Rose (*Rosa*)

BACTERIAL Blast. *Pseudomonas syringae*.

BACTERIAL Crown Gall. *Agrobacterium tumefaciens*, general.

BACTERIAL Hairy Root. *Agrobacterium rhizogenes*, MD, PA, TX, VA, New England.

BLACKSPOT. *Diplocarpon rosae*, general; **Marssonina rosae**, MS.

BLIGHT, Blossom. *Botrytis cinerea*, cosmopolitan; gray mold on canes in storage; *Dothiorella* sp., LA, VA.

- BLIGHT, Cane. **Physalospora obtusa**, CT, to AL, KS, TX; **Gloeosporium** spp., widespread.
- BLIGHT, Southern. **Sclerotium rolfii**, FL, KS, TX.
- BLIGHT, Thread. **Pellicularia koleroga**, FL, LA.
- CANKER, Brand. **Coniothyrium wernsdorffiae**, MN, NY, PA (also reported from CO, IN, MS, TX, but probably mistaken for *C. fuckelii*).
- CANKER, BROWN. **Cryptosporella umbrina**, MA to FL, CA, ID, MI, NE, TX.
- CANKER, Common, Graft. **Leptosphaeria coniothyrium** (*Coniothyrium fuckelii*), general; Graft, **C. rosarum**, CA, IA, MA, MN, NJ, PA, TX.
- CANKER, Crown. **Cylindrocladium scoparium**, in greenhouses, MA to GA, IL, TX.
- CANKER; DIEBACK. **Botryosphaeria ribis** var. **chromogena**, AL, MD, TX, VA; **Cryptosporium minimum**, OR, PA; **Diplodia** spp., probably secondary; **Griphosphaeria corticola** (*Coryneum microstictum*), NH to AL, ND; Pacific Northwest; **Nectria cinnabarina**, coral spot, MA to VA, AK, WA; **Cytospora** sp., KY, PA, VA, WA; **Didymella sepincoliformis**, MD; **Glomerella cingulata**, MD, NJ, VA; **Macrophoma** sp., TX, VA; **Botryodiplodia theobromae**, MN; **Trichothecium roseum**, MN.
- DODDER. **Cuscuta indecora** and **C. paradoxa**, FL, TX.
- DOWNY MILDEW. **Peronospora sparsa**, mostly under glass, ME to FL, CA, IA; reported outdoors in DE.
- FOLIAR LESIONS, Black. **Xanthomonas perforans**, FL.
- LEAF SPOT. **Alternaria** sp., VA to AL, TX; **A. brassicae** var. **microspora**, TX; **Cercospora puderi**, FL, GA; **Mycosphaerella rosicola** (*Cercospora rosicola*), general; **M. rosigena**, doubtfully distinct from *M. rosicola*, reported from South; **Monochaetia compta**, AK, IA, KS, MD; **Pezizella oenotherae**, also cane spot, NJ to FL, MI, TX; **Phyllosticta rosae**, NY to FL, IN; **P. rosae-setigerae**, IN; **Septoria rosae**, MS, NJ, SC.
- MOLD, Black, of Grafts. **Chalaropsis thielavioides**, CA, IL, NY, PA on understock from OR and WA.
- MOLD, Leaf and Bud. **Cladosporium** sp. and **C. fuscum**, AK, CA, MD, MN, MS, OK, TX.
- NEMATODE, Dagger. **Xiphinema diversicaudatum**, greenhouses in Northeast; **X. americanum**; **X. krugi**.
- NEMATODE, Leaf. **Aphelenchoides** spp.; Lance, **Hoplolaimus** sp.
- NEMATODE, LESION. **Pratylenchus pratensis**; **P. scribneri**; **P. vulnus**.
- NEMATODE, Ring. **Criconemoides** sp.; Pin, **Paratylenchus** spp.
- NEMATODE, Root Knot. **Meloidogyne** sp.; **M. hapla**.
- NEMATODE, Spiral. **Helicotylenchus** spp.; Sheath, **Hemicycliophora** sp.
- NEMATODE, Sting. **Belonolaimus gracilis**; Stubby Root, **Trichodorus** sp.
- NEMATODE, Stylet. **Tylenchorhynchus** spp.
- NONPARASITIC. **Boron Deficiency**. Leaves distorted, greenhouse.
- Chlorosis**. Iron deficiency, upper leaves yellow, with green veins; nitrogen deficiency, lower leaves pale; potassium deficiency, leaves grayish, may drop, stems weak.
- Leaf Scorch**. Marginal, potash deficiency. In greenhouses scorch may be boron and calcium deficiency.
- Mercury Toxicity**. In greenhouses when paint containing mercury used on sash.
- Pedicle Necrosis**. Collapse of flower stem, cause unknown.
- Weed-killer Injury**. Leaves fernlike, twisted when 2,4-D used in vicinity.
- PETAL SPOT. **Bipolaris** (*Helminthosporium*) **setariae**, FL.
- POWDERY MILDEW. **Podosphaera pannosa**, general; **S. macularis**, not readily distinguished from *S. pannosa*; **Phyllactinia corylea**, WA.
- ROT, Dry. **Fusarium oxysporum**, Brazil.
- ROT, Root. **Armillaria mellea**, CA, MS, OR, TX, WA; **Clitocybe tabescens**, FL; **Fusarium** spp., occasional, especially in the South; **Phymatotrichum omnivorum**, AZ, TX; **Ramularia macrospora**, MD.



RUST. **Phragmidium americanum** (0, I, II, III), on leaves of cultivated and native roses, ME to NC, ND, TX; **P. montivagum** (0, I, II, III), on native species, SD to NM, AZ, WA; **P. mucronatum** (*P. disciflorum*), the common rust of cultivated roses, possibly on native species (0, I), on leaves and stems; II, III on leaves, eastern states to Rocky Mts.; Pacific Coast; **P. fusiforme** (*P. rosae-acicularis*) (0, I, II, III), on native species, MI to CO, CA, WY; **P. rosae-californicae** (0, I, II, III), on natives, AZ, CA, MT, OR; **P. rosae-pimpinellifoliae** (*P. subcorticium*) (0, I), on stems; II, III on leaves of brier and sweetbrier groups, northern U.S.; **P. rosicola** (III), CO, MT, NE, on native spp.; **P. speciosum** (0, I), on leaves and stems, III on stems of cultivated and native roses, general except far South.

SPOT ANTHRACNOSE. **Elsinoë rosarum**, ME to FL, KS, MI, MO, TX; Pacific Coast.

UNKNOWN. **Speckle**. Chlorotic flecks in leaves, not transmitted by grafting, MD, NJ, NY, PA, TX, VA.

VIRUS. **Rose Mosaic** (in part **Prunus Necrotic Ring Spot** and **Apple Mosaic**), Pacific Coast and eastern states in greenhouses and in gardens on plants shipped from the West Coast; **Rose Rosette** (Witches' Broom), CA, KS, MD, MO, OR; **Rose Streak**, MD, NJ, NY, TX, VA; **Rose Yellow Mosaic**, CA, IL, MD, NY, PA, VA; **Crinkle**. On Manetti understock, sometimes garden roses, Pacific Coast, MD, NY, PA, TX, VA; **Rose Leaf Curl**, CA; **Rose Spring Dwarf**, CA.

WILT. **Verticillium albo-atrum**, AR, CA, IL, NJ, NY; probably wide spread.

Blackspot, brown canker, powdery mildew, and rust are the big four diseases of garden roses. Blackspot is almost inevitable except in some dry western states, and shows up even there when overhead watering is substituted for the usual irrigation. It can be controlled by regular weekly spraying or dusting. Powdery mildew, a problem on the Pacific Coast, is increasing in eastern gardens. Brown canker and other cane diseases are best controlled at spring pruning, by cutting out infected canes and cutting other canes just above a bud, not leaving any stub to die back. Cankers are increased by

excessive winter protection. Where temperatures permit, as in the Central Atlantic region, eliminate soil mounding and other special winter treatment.

Roses are sensitive to many chemicals; it is important to distinguish spray injury from blackspot and not increase the dosage because you think you are not getting control. Combination sprays or dusts should take care of most diseases, as well as insects, in one operation. The bacterial crown gall is occasionally present on plants purchased from a nursery. Ask for a replacement; do not contaminate your soil by planting such a bush.

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### Rose – Acacia (*Robinia hispida*)

LEAF SPOT. **Alternaria fasciculata**, ND.

ROT, Root. **Phymatotrichum omnivorum**, TX.

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### Roselle (*Hibiscus sabdariffa*)

ANTHRACNOSE, Pod Spot. **Colletotrichum gloeosporioides**, FL.

BLIGHT, Gray Mold. **Botrytis cinerea**, MD.

BLIGHT, Southern. **Sclerotium rolfsii**, TX.

LEAF SPOT. **Cercospora hibisci**, TX.

NEMATODE, Root Knot. **Meloidogyne** sp., TX.

POWDERY MILDEW. **Microsphaera euphorbiae**, AL, FL.

ROT, Fruit, Stem. **Fusarium** sp., FL; **Phytophthora parasitica**, TX.

ROT, Root. **Phymatotrichum omnivorum**, TX; **Rhizoctonia solani**, TX.

WILT. **Fusarium oxysporum**, FL.

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### Rose-Gentian (*Sabatia*)

ANTHRACNOSE. **Gloeosporium** sp., OK.

LEAF SPOT. **Cercospora sabbatae**, DE, MS, NC, OK, TX.

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### Rose – Mallow (*Hibiscus palustris*)

BACTERIAL Crown Gall. **Agrobacterium tumefaciens**, MS.

DIEBACK. *Colletotrichum hibisci*, NJ, NY, TX.  
 LEAF SPOT. *Ascochyta abelmoschi*, NY;  
*Cercospora kellermanii*, IN; *Phyllosticta hibiscina*, CT, FL, LA, MD, NJ, NY;  
*Septoria* sp., NJ.  
 ROT, Root. *Phymatotrichum omnivorum*, TX.  
 RUST. *Puccinia schedonnardi* (0, I), CT to AL, NE, TX; II, III on grasses.

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### Rosemary (*Rosmarinus*)

BLIGHT, AERIAL, ROT ROOT. *Rhizoctonia solani*, LA, OK.  
 ROT, Root. *Phymatotrichum omnivorum*, TX.

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### Rose-of-Sharon, Shrub-Althaea (*Hibiscus syriacus*)

LEAF SPOT. *Cercospora malayensis*, GA;  
*Phyllosticta hibiscina*, OK; *P. syriaca*, NY.  
 NEMATODE, Root Knot. *Meloidogyne* sp., MS, TX.  
 ROT, Root. *Phymatotrichum omnivorum*, TX.  
 RUST. *Kuehneola malvicola* (II, III), Gulf states.

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### Rouge-Plant (*Rivina*)

LEAF SPOT. *Cercospora flagellaris*, FL, TX;  
*Septoria rivinae*, TX.  
 ROT, Root. *Helicobasidium purpureum*, TX;  
*Phymatotrichum omnivorum*, TX.  
 RUST. *Puccinia raunkaerii* (0, I, II, III), FL, TX.

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### Rubber-Plant (*Ficus elastica*)

ANTHRACNOSE. *Glomerella cingulata*, general;  
*Gloeosporium* sp., WA.  
 BACTERIAL Crown Gall. *Agrobacterium tumefaciens*, CA, TX.  
 CANKER; DIEBACK. *Physalospora rhodina*, GA.  
 LEAF SPOT. *Alternaria* sp., IN, OH, TX;  
*Leptostromella elastica*, NY, Northeastern states;  
*Mycosphaerella bolleana*, GA;  
*Phyllosticta* sp., MD, NY; *Phyllosticta*

*roberti*, Gulf states, MD, NY; *Stemphylium elasticae*, secondary; *Trabutia (Phyllachora) ficuum*, black spot, FL.  
 NEMATODE, Leaf. *Aphelenchoides besseyi*, FL.  
 NEMATODE, Root Knot. *Meloidogyne* spp.;  
*M. incognita*.  
 NEMATODE, Spiral. *Helicotylenchus nannus*.

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### Rudbeckia (Golden-Glow, Coneflower, Black-Eyed Susan)

BACTERIAL, MLO. Aster Yellows, NY, and California Aster Yellows, CA.  
 BLIGHT, Southern. *Sclerotium rolfsii*, FL, NJ.  
 DOWNY MILDEW. *Plasmopara halstedii* IA, NE, NY, NC, ND, VA, WI.  
 GALL, Leaf. *Synchytrium aureum*, IL, WI.  
 LEAF SPOT. *Cercospora rudbeckiae*, NY;  
*C. tabacina*, IL, NY, WI; *Phyllosticta rudbeckiae*, IA, NY, WI; *Ramularia rudbeckiae*, VT to MS, CO, ID, MT, VA, VT, WV; *Septoria rudbeckiae*, DE, KS, NE, WA, WI.  
 POWDERY MILDEW. *Golovinomyces cichoracearum*, general.  
 ROT, Root. *Phymatotrichum omnivorum*, TX.  
 ROT, Stem. *Sclerotinia sclerotiorum*, CT.  
 RUST. *Aecidium batesii* (0, I), NE; *Puccinia dioicae* (0, I), MD, SD; *P. rudbeckiae* (III) TX; *Uromyces perigynius* (0, I), MD to MT; II, III on *Carex*; *U. rudbeckiae* (III), MT, MD to MS, NM, TX.  
 SMUT, White. *Entyloma compositarum*, IA, MO, OH, WI.  
 VIRUS. Potato Yellow Dwarf, NY; Mosaic, unidentified, IL, IN; *Bidens Mottle*, FL; *Tomato Spotted Wilt*, TX.  
 VIRUS, Phyllody. *Flower Distortion*, MN.  
 WILT. *Verticillium albo-atrum*, NY.

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### Rue Anemone (*Anemonella*)

LEAF SPOT. *Cercospora caulophylli*, MO.  
 POWDERY MILDEW. *Erysiphe polygoni*, IA.  
 RUST. *Puccinia recondita* (0, I), IN, IA, MO.  
 SMUT, Leaf and Stem. *Urocystis anemones*, NY.

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**Ruellia**BLIGHT, Southern. *Sclerotium rolfsii*, LA.LEAF SPOT. *Cercospora consociata*, AL, IL, IA, MS, MO.ROT, Root. *Phymatotrichum omnivorum*, TX.RUST. *Puccinia lateripes* (0, I, II, III), MD to FL, KS, MO, TX; *Uromyces ruelliae* (0, I, II, III), TX.

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**Rumex (Garden Sorrel)**BACTERIAL, MLO. **California Aster Yellows**, CA.GALL, Leaf. *Synchytrium anomalum*, IA.LEAF SPOT. *Cercospora acetosellae*, LA, TX; *Phyllosticta* sp., NY; *Gloeosporium rumicis*, NY, TX; *Septoria pleosporioides*, TX.NEMATODE, Ring. *Criconebella xenoplax*, SC.NEMATODE, Root Knot. *Meloidogyne* sp., FL.ROT, Root. *Rhizoctonia solani*, TX.RUST. *Puccinia acetosae* (II, III), ME to FL.VIRUS. **Tomato Ringspot**, PA.

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**Russian Knapweed (*Acroptilon repens*)**LEAF SPOT. *Cercospora acroptili*, MT.RUST. *Puccinia acroptili*, CO, MT, WY.

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**Russian-Olive, Silverberry (*Elaeagnus*)**CANKER. *Fusicoccum elaeagni*, IL, MO.

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**Rutabaga**

► Turnip.

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**Safflower (*Carthamus*)**ANTHRACNOSE; Blight. *Gloeosporium carthami*, IN, TX, VA.BACTERIAL Blight. *Pseudomonas syringae*, CA.BLIGHT. *Botrytis cinerea*; *Rhizoctonia* sp., NM.LEAF SPOT. *Alternaria* spp., AZ, CA, IN, MT, NE, ND; *Septoria carthami*, IN, TX; *Stemphylium* sp., FL; *Cercospora beticola*, MT.; *Ramularia carthami*, *Ramularia cercosphaelloides*, Sonora, Mexico.POWDERY MILDEW. *Golovinomyces cichoracearum*, CA.ROT, Root. *Phytophthora drechsleri*, CA.ROT, Stem; Wilt. *Sclerotinia sclerotiorum*, IN, ND, VA.RUST. *Puccinia carthami* (II, III), CO, MA, MT, NE, ND.VIRUS. **Cucumber Mosaic**, AZ, CA; **Turnip Mosaic**, CA.WILT. *Fusarium oxysporum* f. sp. *carthami*; *Verticillium albo-atrum*.

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**Sage (*Salvia*) (Includes Blue, Clary, Sauceleaf, Scarlet, Black Ornamental Forms)**BACTERIAL, MLO. **California Aster Yellows**, CA.BLIGHT, Southern. *Sclerotium rolfsii*, IL.DAMPING-OFF. *Pythium debaryanum*, OH; *Rhizoctonia solani*, CT, IL, NJ, OH.DOWNY MILDEW. *Peronospora lamii*, IA, LA; *P. swinglei*, KS.LEAF SPOT. *Cercospora salviicola*, OK, TX; *Ramularia salviicola*, OK; *Myrothecium roridum*, FL.NEMATODE, Leaf. *Aphelenchoides fragariae*, DE, NJ.NEMATODE, Root Knot. *Meloidogyne* spp., AZ, NJ; *M. javanica*.POWDERY MILDEW. *Golovinomyces cichoracearum*, CA.ROT, Charcoal. *Macrophomina phaseoli*, SC.ROT, Root. *Fusarium oxysporum*, NC; *Phytophthora dreschleri*; *P. parasitica*, NC; *Phymatotrichum omnivorum*, TX; Stem, *Sphaeropsis salviae*, MS.ROT, Root and Crown. *Phytophthora cryptogea*, CA.

RUST. *Aecidium subsimulans*, AZ; *Puccinia ballotaefflorae* (II, III), TX; 0, I unknown; *P. caulicola* (0, I, II, III), IA to TX, NM; *P. farinacea* (0, I, II, III), AL, AZ, KS, MS, MO, NE, OK, TX; *P. salviicola* (0, I, II, III), FL, TX; *P. vertisepta* (0, I, III), AZ, NM; *P. melliflora* (I, III), CA.

STEM SPOT, Lesion; Wilt. *Sclerotinia sclerotiorum*, ND.

VIRUS. Tomato Spotted Wilt.

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### Sage-Brush (*Artemisia*)

BLIGHT, Gray Mold. *Botrytis cinerea*, AK.

BLIGHT, Stem. *Sclerotium* sp., OR.

CANKER, Stem Gall, Black Knot. *Syncarpella tumefaciens*, CA, MT, NV.

DODDER. *Cuscuta* sp., TX.

DOWNY MILDEW. *Peronospora leptosperma*, CA, IA, KS, ND, WI.

LEAF SPOT. *Cercospora ferruginea*, WI; *C. olivacea*, NY; *Cylindrosporium artemisiae*, WA, WI; *Heterosporium* sp., AK; *Phyllosticta raii*, MT; *Ramularia artemisiae*, NY, WI; *Septoria artemisiae*, WA.

NEMATODE, Root Knot. *Meloidogyne* sp., AL.

POWDERY MILDEW. *Golovinomyces cichoracearum*, WI to NM, CA, WA.

ROT, Root. *Phymatotrichum omnivorum*, TX.

RUST. *Puccinia atrofusca*, IA to TX, CA, OR; II, III on *Carex*; *P. millefolii* (III), ND to TX, AK, CA, WA; *P. tanacetii* (0, I, II, III), WI to TX, CA, WA; 0, I, II, III on *Tanacetum* and II on chrysanthemum; *Uromyces oblongisporus* (III), WY.

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### Sainfoin (*Onobrychis*)

DAMPING-OFF. *Rhizoctonia solani*, TX; *Sclerotium rolfsii*, TX.

NEMATODE, Root Knot. *Meloidogyne hapla*, WY.

ROT, Stem. *Rhizoctonia solani*, TX; *Sclerotium rolfsii*, TX.

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### St. Andrews Cross, St. Peterswort (*Ascyrum*)

LEAF SPOT. *Cladosporium gloeosporioides*, AL.  
RUST. *Uromyces triquetrus* (0, I, II, III), MS, NJ, TX.

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### St. Augustinegrass (*Stenotaphrum*)

ROT, Root. *Gaeumannomyces graminis* var. *graminis*, FL, TX.

VIRUS. *Panicum Mosaic*, AR.

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### St. Johnswort (*Hypericum*)

BLACK KNOT. *Gibberidea heliopsisidis*, MD.

BLIGHT, Leaf. *Rosellinia (Dematophora) necatrix*; *Diploceras hypericum* (stem and leaf), OR.

BLIGHT, Southern. *Sclerotium rolfsii*, SC.

GALL, Stem. *Sphaeropsis tumefaciens*, FL.

LEAF SPOT. *Cercospora hyperici*, IL; *Cladosporium gloeosporioides*, AL, NJ, NY, WI.

NEMATODE, Root Knot. *Meloidogyne* spp.

POWDERY MILDEW. *Golovinomyces cichoracearum*.

RUST. *Melampsora hypericorum* (II), MT; *Uromyces triquetrus* (0, I, II, III), ME to AL, and IA, TX, WI.

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### Salal (*Gaultheria shallon*)

ANTHRACNOSE. *Colletotrichum acutatum*, British Columbia, Canada.

BLACK MILDEW. *Meliola* sp.

LEAF SPOT. *Dasyscyphus gaultheriae*, CA, OR, WA; *Mycosphaerella gaultheriae*, Pacific Coast, AK; *Pestalopezia brunneo-pruinosa*, CA, OR, WA; *Phyllosticta gaultheriae*, general.

LEAF, Stem Lesions. *Phoma exigua*, British Columbia, Canada.

POWDERY MILDEW. *Microsphaera alni*, OR.

SPOT ANTHRACNOSE. *Elsinoë ledi*, OR, WA.

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**Salpiglossis (Painted-Tongue)**

BACTERIAL Canker, Vascular. *Clavibacter michiganense*, WY.  
 BACTERIAL, MLO. California Aster Yellows, CA.  
 NEMATODE, Lesion. *Pratylenchus pratensis*, NY.  
 NEMATODE, Root Knot. *Meloidogyne* sp., NY.  
 WILT. *Fusarium* sp., WA; *Verticillium albo-atrum*, NY.

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**Salsify (*Tragopogon*)**

BACTERIAL, MLO. California Aster Yellows, CA; Aster Yellows, MD, NY, PA, WI.  
 BACTERIAL Soft Rot. *Erwinia carotovora*, CT, TX.  
 BLIGHT, Leaf. *Sporodesmium scorzonerae*, AL, MD, NY, PA, VA, WV.  
 BLIGHT, Southern. *Sclerotium rolfsii*, TX.  
 LEAF SPOT. *Cercospora tragopogonis*, MT, OK; *Stemphylium botryosum*, NY; *Alternaria tenuis*.  
 NEMATODE, Leaf and Stem. *Ditylenchus dipsaci*, CA.  
 NEMATODE, Root Knot. *Meloidogyne* sp., NY to AL, TX, WA.  
 POWDERY MILDEW. *Golovinomyces cichoracearum*, general.  
 ROT, Root. *Phymatotrichum omnivorum*, AZ, TX; *Rhizoctonia solani*, TX, WA.  
 ROT, Stem, Crown. *Sclerotinia intermedia*, IL; *S. sclerotiorum*, IL.  
 VIRUS. Beet Curly Top; Lettuce Mosaic, NY.  
 WHITE RUST. *Albugo tragopogonis*, CA.  
 WILT. *Verticillium albo-atrum*, NY.

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**Salsify, Black (*Scorzonera*)**

BACTERIAL, MLO. California Aster Yellows, CA.  
 NEMATODE, Root Knot. *Meloidogyne* sp., FL.  
 WHITE RUST. *Albugo tragopogonis*, CA.

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**Salt Bush (*Atriplex*)**

DOWNY MILDEW. *Peronospora farinosa*, MT, TX.  
 GALL, Leaf, Stem. *Urophlyctis pulposa*, ND, TX.  
 LEAF SPOT. *Cercospora dubia*, widespread; *Stagonospora atriplicis*, KS, NE, NJ, NY, PA.  
 NEMATODE, Root Knot. *Meloidogyne* sp., CA; root gall, *Heterodera schachtii*, UT.  
 RUST. *Puccinia aristidae* (0, I); II, III on grasses; *Uromyces shearianus* (0, I, III).  
 VIRUS. Beet Curly Top; Iris Yellow Spot, UT.

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**Saltgrass (*Distichlis*)**

BROWN STRIPE. *Bipolaris heveae*, CO.

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**Salvinia (*Aquatic Fern*)**

LEAF SPOT, Water-Soaked Lesions. *Rhizoctonia solani*, FL.

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**Sanchezia**

ROT, Mushroom Root. *Clitocybe tabescens*, FL.

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**Sand-Myrtle (*Leiophyllum*)**

GALL, Leaf. *Exobasidium vaccinii*, NJ, NC.

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**Sand-Verbena (*Abronia*)**

DOWNY MILDEW. *Peronospora oxybaphi*, TX.  
 LEAF SPOT. *Heterosporium abroniae*, CA, TX.  
 RUST. *Puccinia aristidae*, AZ, CA, CO, NM; II, III on grasses.

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**Sandvine (*Ampelanus*)**

BLACK MILDEW. *Meliola bidentata*, NC.  
 DOWNY MILDEW. *Plasmopara gonolobi*, SC.

LEAF SPOT. *Cercospora gonolobi*, OK; *Septoria* sp., LA.  
RUST. *Puccinia obliqua* (III), OK, TX.

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### Sandwort (*Arenaria*)

LEAF SPOT. *Hendersonia tenella*, TX.  
POWDERY MILDEW. *Erysiphe polygoni*, CA.  
ROT, Root. *Phymatotrichum omnivorum*, TX.  
RUST. *Puccinia arenariae* (III), CA, FL, MT, NY, TX, WI; *P. tardissima*, CO, NM, UT, WY; *Uromyces inaequaltus* (0, I, II, III), CO, UT.  
SMUT, Anther. *Ustilago violacea*, ME, NH, NY, VT.

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### Sanguisorba (Burnet)

LEAF SPOT. *Graphium sessile*, NY; *Ovularia bulbifera*, AK, IL.  
POWDERY MILDEW. *Podosphaera oxyacanthae*, IA; *Sphaerotheca macularis*, AK, KS, NY, PA.  
RUST. *Xenodochus carbonarius* (I, III), AK; *X. minor*, AK.

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### Sansevieria (Bowstring-Hemp, Snake Plant)

BACTERIAL Soft Rot. *Erwinia aroideae* and *E. carotovora*, AZ, FL, MD, NJ.  
LEAF SPOT. *Fusarium moniliforme*, FL, MO, WA; *Gloeosporium sansevieriae*, FL, WA.  
NEMATODE, Lesion. *Pratylenchus* sp., CA.  
NEMATODE, Root Knot. *Meloidogyne* sp.; *M. javanica*.  
NONPARASITIC. Wilt. Overfertilization or toxic salts.  
ROT. *Aspergillus niger*; *Fusarium* sp.

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### Sapodilla (*Achras*)

GALL, Limb. *Pestalotia scirrofaciens*, FL, TX.  
LEAF SPOT. *Phyllosticta* sp., FL; *Septoria* sp., FL.

ROT, Root. *Phymatotrichum omnivorum*, TX.  
RUST. *Scopella (Uredo) sapotae* (II), FL.  
SPOT ANTHRACNOSE. *Elsinoë lepagei*, FL.

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### Sassafras

CANKER, Branch, Trunk. *Nectria* sp., CT to WV, MS.  
CANKER; DIEBACK. *Physalospora obtusa*, NY to GA.  
LEAF SPOT. *Septoria* sp., NY; *Actinothyrium gloeosporioides (Actinopella dryina)*; *Cristulariella pyramidalis*; *Phyllosticta illinoiensis*, IL, MA; *P. sassafras*, NY to GA, TX, IL.  
MISTLETOE. *Phoradendron serotinum (flavescens)*, TX.  
POWDERY MILDEW. *Phyllactinia corylea*, MI.  
ROT, Heart, Trunk. *Daedalea confragosa*, IN, NY; *Fomes ignarius*, OH, VA; *F. ribis*, MO.  
ROT, Root. *Armillaria mellea*, PA; *Phymatotrichum omnivorum*, TX.  
ROT, Wood. *Daldinia vernicosa*; *Hymenochaete agglutinans*; *Hypoxylon* spp.; *Polyporus* spp., sometimes on living trees; *Poria ferruginosa*; *Schizophyllum commune*, NY; *Trametes sepium*, IN.  
VIRUS. Mosaic, NY; Yellows, TX, unidentified.  
WILT, Laurel. *Raffaelea lauricola*, FL, MS, SC.  
The undetermined yellows disease causes fasciation of tops, leafroll, and dwarfing of leaves.

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### Saururus (Swamp-Lily, Water Dragon)

GALL, Leaf. *Physoderma* sp., VA.  
LEAF SPOT. *Cercospora saururi*, AL, FL, IL, IN, LA, NY, TX; *Ramularia saururi*, OK.  
NEMATODE, Root Knot. *Meloidogyne* sp.

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### Saxifrage (*Saxifraga*)

BLIGHT, Gray Mold. *Botrytis cinerea*, AK.  
LEAF SPOT. *Cercospora saxifragae*, WI; *Phyllosticta saxifragarum*, WY; *Septoria albicans*, WI; *Ramularia* sp., AK.

POWDERY MILDEW. **Sphaerotheca macularis**, AK, CO, NY, PA, WY.

RUST. **Melampsora arctica** (0, I), AK, CO; II, III on willow; **Puccinia heucherae** (III), AK, MT to NM, ID, WA, WY, NY to IL, MT; **P. pazschkei** (III), ID, MT, WA; and var. **tricuspidatae**, CO, UT.

VIRUS. **Impatiens Necrotic Spot**, NC.

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## Scabiosa

BACTERIAL, MLO. **Aster Yellows**, CT, NJ, NY, VA; and **California Aster Yellows**, CA.

BLIGHT, Southern. **Sclerotium rolfsii**.

POWDERY MILDEW. **Erysiphe polygoni**; **E. knautiae**, NY, WA.

ROT, Root. **Phymatotrichum omnivorum**, TX.

ROT, Stem. **Sclerotinia sclerotiorum**, NY.

VIRUS. **Beet Curly Top**, CA.

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## Scarborough-Lily (*Vallota*)

LEAF SCORCH; Red Spot. **Stagonospora curtisii**, LA.

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## Schefflera (*Brassaia actinophylla* = *Scheffiera actinophylla*)

BACTERIAL Blight. **Pseudomonas cichorii**, FL.

LEAF SPOT. **Alternaria panax**, CA, FL.

NEMATODE, Root Knot. **Meloidogyne incognita**.

ROT, Stem, Leaf, Cutting. **Fusarium solani**, FL.

VIRUS. **Ghost Ring**; **Scheffiera Ringspot**.

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## Schefflera, Dwarf (*Scheffiera arboricola*)

BACTERIAL Leaf Blight. **Pseudomonas cichorii**, FL.

LEAF SPOT. **Alternaria** sp. FL.

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## Schrankia

RUST. **Ravenelia morongiae**, TX.

STEM SPOT. **Cercospora morongiae**, MS.

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## Scilla (Squill)

LEAF SPOT. **Embellisia hyacinthi**, CA.

NEMATODE, Bulb. **Ditylenchus dipsaci**, VA.

ROT, Blue Mold. **Penicillium gladioli**, on imported bulbs.

ROT, Bulb. **Sclerotium rolfsii**, WA.

SMUT, Flower. **Ustilago vaillantii**, MA, WA.

VIRUS. **Ornithogalum Mosaic**, NY.

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## Scindapsus

► Pothos.

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## Sea-Grape, Dove-Plum (*Coccoloba*)

SPOT, Tar. **Phyllachora simplex**, FL.

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## Sea-Kale (*Crambe*)

LEAF SPOT, Black. **Alternaria oleracea**, VA.

ROT, Root; Damping-off. **Aphanomyces raphani**, WI.

VIRUS. **Beet Western Yellows Virus**, CA.

WILT, Yellows. **Fusarium oxysporum** f. sp. **conglutinans**, IN.

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## Seashore Paspalum (*Paspalum*)

BLIGHT, Basal Leaf. **Waitea circinata** var. **prodigus**, FL.

NEMATODE. *Helicotylenchus* sp., FL.  
 ROT, Root/Stolon. *Gaeumannomyces graminis*  
 var. *graminis*. FL.

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### **Sedum (Stonecrop)**

BLIGHT, Southern. *Sclerotium rolfii*, KS,  
 NJ, VA.  
 LEAF SPOT. *Septoria sedi*, IL, IA, ME, NY;  
*Pleospora* sp., NY; *Stemphylium bolickii*, FL.  
 NEMATODE, Root Knot. *Meloidogyne* sp.  
 POWDERY MILDEW. *Erysiphe sedi*, NY.  
 ROT, Stem. *Colletotrichum* sp. (*Vermicularia*  
*benficiens*), NY, VA; *Phytophthora* sp., NY;  
*Rhizoctonia solani*, IL, NJ.  
 RUST. *Puccinia rydbergii* (III), UT; *P. umbilici*  
 (III), CO, WY.  
 VIRUS. **Tomato Spotted Wilt**, PA.  
 VIRUS, Foliar Ringspot. **Tobacco Rattle Virus**,  
 MN.  
 WILT. *Fusarium oxysporum* f. sp. *sedi*, CA.

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### **Sempervivum (Houseleek)**

ROT, Leaf and Stem. *Phytophthora parasitica*,  
 NY.  
 ROT, Root. *Pythium* sp., IA.  
 RUST. *Endophyllum sempervivi* (III), MA, NJ,  
 NY.

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### **Senecio (Groundsel)**

BACTERIAL, MLO. **California Aster Yellows**.  
 GALL, Leaf. *Synchytrium aureum*, WI.  
 LEAF SPOT. *Cercospora senecionicola*, WI;  
*C. senecionis*, TX; *Gloeosporium*  
*senecionis*, CA; *Phyllosticta garrettii*, OR,  
 UT, WY; *Ramularia filaris*, CO, MT;  
*R. pruinosa*, CO, WY; *R. senecionis*, CA,  
 CO; *Septoria cacaliae*, AL, IN, TX;  
*S. senecionis*, CA.  
 NEMATODE, Leaf. *Aphelenchoides ritzemabosi*.  
 POWDERY MILDEW. *Golovinomyces*  
*cichoracearum*, ID, MN, NE, VA, WA;  
*Sphaerotheca macularis*, CO, MT, UT, WY.

ROT, Root. *Phymatotrichum omnivorum*, TX;  
*Rhizoctonia solani*, IL, NJ.  
 ROT, Stem. *Phytophthora* sp., NJ; *Sclerotinia*  
*sclerotiorum*, LA.  
 RUST. *Coleosporium occidentale* (II, III), CA,  
 CO, ID, MT, OR, WA, WY; 0, I unknown;  
*C. senecionis* (II, III), CO, RI; *Puccinia*  
*angustata* var. *eriphori* (0, I), CT, IA, MN,  
 NH, UT, VT; II, III on *Eriophorum* and  
*Scirpus*; *P. expansa*, CA, UT, WA, WY;  
*P. lagenophorae*, CA; *P. recedens*, CO, CT  
 to NC, IA, TN, ND to OR, WA, WY;  
*P. dioicae* (0, I), NE, NM, TX; II, III on  
*Carex*; *P. stipae* (0, I), CO, NE, WY; II, III  
 on *Stipa*; *P. subcircinata* (0, I, III), ID, NE,  
 NV, NM, ND, UT, WA; *Baedromus*  
*californicus* (III), CA.  
 SMUT, White. *Entyloma compositarum*, KS,  
 MD, NE, PA, TX, WI.  
 VIRUS. **Tomato Spotted Wilt**.  
 WHITE RUST. *Albugo tragopogonis*, CA, CO, IN,  
 MO, MT, NE, UT, WA.  
 WILT. *Fusarium* sp., NJ; *Verticillium albo-*  
*atrum*, WA.

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### **Sequoia (Redwood and Giant Sequoia)**

BLIGHT, Needle. *Chloroscypha chloromela*;  
*Cercospora sequoiae*, MD, PA;  
*Mycosphaerella sequoiae*; *Pestalotia*  
*funerea*, TX; *Phytophthora citrophthora*,  
 also branch dieback, CA.  
 BLIGHT, Seedling. *Botrytis douglasii*, CA, OH,  
 PA.  
 BLIGHT, Twig. *Phomopsis juniperovora*; *Botry-*  
*tis cinerea*.  
 BURLS, Gall, on trunk. Cause unknown.  
 CANKER. *Botryosphaeria dothidea*, VA. [Red-  
 wood, Dawn] [U.S. Nat'l Arboretum, Wash-  
 ington, DC]; *B. dothidea* (= *B. ribis*), CA;  
*Phytophthora ramorum* (branch and leaf  
 discolor), CA.  
 CANKER, Bark. *Dermatea livida*.  
 NEMATODE. *Meloidogyne hapla*, *M. incognita*,  
*M. javanica*, *Pratylenchus penetrans*,  
*P. vulnus*, *Xiphinema bakeri*, CA.  
 ROT, Charcoal. *Macrophomina phaseoli*.



ROT, Root. *Armillaria mellea*; *Phymatotrichum omnivorum*, TX.  
 ROT, Trunk; Heart. *Fomes annosus*; *Ganoderma sequoiae*; *Poria sequoiae*; *P. albipellucida*.  
 ROT, Wood. *Hymenochaete tabacina*; *Lenzites saepiaria*; *Merulius hexagonoides*; *Polyporus* spp.; *Schizophyllum commune*; *Stereum* spp.; *Trametes* spp.

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### **Sericarpus (White-Topped Aster)**

RUST. *Coleosporium asterum* (II, III), CT; *Puccinia dioicae* (0, I), IN, NC, TN.

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### **Sesame (*Sesamum*)**

BACTERIAL Leaf Spot. *Pseudomonas sesami*, KS, TX.  
 BACTERIAL Wilt. *Pseudomonas solanacearum*, AZ.  
 BLIGHT. *Corynespora cassicola*, MS, Southeast.  
 LEAF SPOT. *Alternaria sesami*, Southeast; *A. tenuissima*, TX; *Cercospora sesami*, FL, GA, SC; *Cylindrocladium sesami*, FL, SC; *Helminthosporium sesami*, TX.  
 ROT, Charcoal. *Macrophomina phaseoli*, CA, TX.  
 VIRUS. Cowpea Aphid-Borne Mosaic, Paraguay.  
 WILT. *Verticillium albo-atrum*, NM.

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### **Sesuvium**

NEMATODE, Root Knot. *Meloidogyne* sp., AL, FL.  
 ROT, Root. *Phymatotrichum omnivorum*, TX.  
 RUST. *Puccinia aristidae* (0, I), TX; II, III on grasses.  
 WHITE RUST. *Albugo trianthemi*, TX.

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### **Shallot (*Allium ascalonicum*; *A. porrum*, Leek)**

BACTERIAL Blight. *Pseudomonas syringae* pv. *porri*, CA.  
 BACTERIAL, MLO. Aster Yellows, LA.

BLIGHT, Southern. *Sclerotium rolfsii*, LA.  
 BLOTCH, Purple. *Alternaria porri*, CA, LA, TX.  
 DOWNY MILDEW. *Peronospora destructor*, LA.  
 NEMATODE, Root Knot. *Meloidogyne* sp., TX.  
 ROT, Bulb and Basal. *Fusarium culmorum*, CA.  
 ROT, Neck; Gray Mold, *Botrytis allii*, LA; Smudge, *Colletotrichum circinans*, IL, LA, WI.

ROT, Pink Root. *Pyrenochaeta terrestris*, CO, LA, TX; *Fusarium solani*, TX.

ROT, White. *Sclerotium cepivorum*, LA, VA.

SMUT. *Urocystis cepulae*, MA.

VIRUS. Mosaic, unidentified; Tomato Spotted Wilt, GA; Irish Yellow Spot, CO, OR.

Pink root and white rot are prevalent in Louisiana. Losses from white rot are heavy if plants are set late; September setting may give a good crop.

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### **Shasta Daisy (*Leucanthemum x Superbum*)**

BACTERIAL Fasciation. *Clavibacter fascians*, CA.  
 LEAF BLOTCH. *Septoria leucanthemi*, CA, OR.  
 LEAF SPOT. *Cercospora chrysanthemi*, OK.  
 NEMATODE, Root Knot. *Meloidogyne* spp., AL, FL, MS.  
 ROT, Root. *Pythium* sp., NJ.  
 ROT, Stem. *Rhizoctonia solani*, MD; *Sclerotinia sclerotiorum*, MT, WA; *Fusarium roseum* and *F. solani*, TX.

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### **Shepherd's Purse (*Capsella*)**

BACTERIAL, Yellows. *Spiroplasma citri*, IL.

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### **Shining Willow (*Salix lucida*)**

LEAF SPOT. *Septoria musiva*, Quebec, Canada.  
 BACTERIAL, Yellows. *Spiroplasma citri*, IL.

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### **Shortia (*Oconee-bells*)**

LEAF SPOT. *Pezizella oenotherae*, NC, SC.

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## Sida

BLIGHT, Southern. *Sclerotium rolfsii*, FL.

CANKER, Stem. *Diaporthe phaseolorum* var. *caulivora*, LA.

LEAF SPOT. *Cercospora sidicola*; *Colletotrichum malvarum*, KS, TX, UT; *Phyllosticta spinosa*, KS, TX; *Ramularia sidarum*, FL; *Sclerotinia minor* (bleached leaf and stem lesions), NC.

NEMATODE, Root Knot. *Meloidogyne* spp., AL, FL, MS.

ROT, Root. *Phymatotrichum omnivorum*, TX.

RUST. *Puccinia heterospora*, FL to TX, IN, MO; *P. lobata*, AZ, CA, NM, TX, UT; *P. schedonnardi*, NM.

VIRUS. *Abutilon Mosaic*, FL.

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## Silene (Catchfly, Cushion-Pink, Campion)

BROOMRAPE. *Orobanche ramosa*, TX.

DAMPING-OFF. *Rhizoctonia solani*, IL.

DOWNY MILDEW. *Peronospora silenes*, IL, KS, NE, TX, WI.

LEAF SPOT. *Ascochyta silenes*, MT, OK, WI; *Marssonina delastrei*, WI; *Phyllosticta nebulosa*, MT, NY, WI; *Septoria dimera*, NE, WI; *S. silenes*.

RUST. *Uromyces silenes* (0, I, II, III), CA, IA, KS, MT, PA, WA; *U. suksdorfii*, CA, ID, NM, UT, WA; *Puccinia aristidae* (0, I), AZ, TX.

SMUT, Flower. *Sorosporium saponariae*, CO, NV, UT; *Ustilago violacea*, anther smut, CA, MT, NH, TX, VA, WA, WY.

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## Silk-Tassel Bush (*Garrya*)

BLACK MILDEW. *Lembosia lucens*, CA.

LEAF SPOT. *Cercospora garryae*, CA, TX; *Dothichiza garryae*, CA; *Phyllosticta garryae*, CA, TX.

ROT, Root. *Phymatotrichum omnivorum*, TX.

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## Silphium (Compass Plant, Indian-Cup)

BACTERIAL Leaf Spot. *Pseudomonas syringae* pv. *tagetis*, WI.

DOWNY MILDEW. *Plasmopara halstedii*, IL, IA, WI to AR, KS, MN.

LEAF SPOT. *Ascochyta compositarum*, WI; *Cercospora silphii*, AL, IL, KS, TX, WV, WI; *Colletotrichum silphii*, WI; *Septoria alba*, IL, KS.

POWDERY MILDEW. *Golovinomyces cichoracearum*, CT, MD.

ROT, Root. *Phymatotrichum omnivorum*, TX; *Rhizoctonia solani*, ME.

RUST. *Puccinia silphii* (III), NC to AL, TX, ND; *Coleosporium terebinthinaceae* (II, III), PA to FL, TX, KS; 0, I on pines; *Uromyces silphii* (0, I), OH to MO, KS and WI; II, III on *Juncus*.

SMUT, White. *Entyloma compositarum*, TX, WI.

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## Skimmia

VIRUS. *Tobacco Ring Spot*, NY.

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## Skullcap (*Scutellaria*)

LEAF SPOT. *Cercospora scutellariae*, IL, MS, MO, TX; *Phyllosticta decidua*, TX, WI; *Septoria scutellariae*, ME to IA, CA, CO, MS, OK.

POWDERY MILDEW. *Erysiphe galeopsidis*, IL, IN, IA, KS, MI, NY, OH, WI; *Microsphaera* sp., IL.

ROT, Root. *Phymatotrichum omnivorum*, TX; *Rhizoctonia solani*, TX.

ROT, Stem. *Botrytis cinerea*, WA.

VIRUS. *Alternanthera Mosaic*, FL, MD, PA.

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## Skunk-Cabbage (*Symplocarpus*)

BLIGHT, Leaf. *Botrytis streptothrix*, CT, IL, NJ, NY.

LEAF SPOT. *Cercospora symplocarpi*, MA to VA, IN, WI; *Septoria spiculosa*, MD, NY, PA, WI.

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### Skunk Vine (*Paederia foetida*)

LEAF SPOT. *Pseudocercospora paederiae*, FL.

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### Slenderflower Thistle (*Carduus*)

RUST. *Puccinia carduorum*, CA.

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### Small Flower Galinsoga (*Galinsoga parviflora*)

ROT, Stem. *Whetzelinia sclerotiorum*, MD.

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### Smelowskia

RUST. *Puccinia aberrans* (0, III), CO, MT, NE, UT, WA; *P. holboellii*, NV; *P. monoica*, CO, WY.

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### Smilax (Greenbrier Cat-Brier)

For Florists' Smilax, ► *Asparagus*.

CANKER, Felt Fungus. *Septobasidium pseudopedicellatum*, FL.

GALL. *Synchytrium smilacis*.

LEAF SPOT. *Ascochyta confusa*, NY, WI; *Cercospora smilacina*, CT to FL, TX; *C. smilacis*, MA to FL, TX, and MN; *Colletotrichum smilacis*, IL; *Cylindrosporium smilacis*, AL; *Dothiorella smilacina*, MA to LA, TX; *Mycosphaerella smilacicola*, GA, SC; *Pestalotia clavata*, NY to AL, LA; *Phyllosticta subeffusa*, IL, KS, WV; *Ramularia subrufa*, IA, MS, NE, WI; *Septogloeum subnudum*, IL, WI; *Septoria smilacis*, WV; *Sphaeropsis cruenta*, IA; *Stagonospora smilacis*, CT to MD, ND, TX.

NEMATODE, BUITOWING. *Radopholus similis*, FL.

POWDERY MILDEW. *Phyllactinia corylea*, MI.

ROT, Root. *Helicobasidium purpureum*, TX.

RUST. *Puccinia amphigena* (0, I), KS, MI, NE, ND; II, III on *Calamovilfa*; *P. arundinariae* (0, I), NC, SC; *P. macrospora* (0, I), DE, NJ, NY; II, III on *Carex*; *P. smilacis* (II, III), MA to FL, TX, and NE; 0, I on *Apocynum*.

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### Smithantha

VIRUS. Tobacco Mosaic, CA, CT, DC, FL, OH, WA.

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### Smithiana

VIRUS. *Smithiana Potexvirus*.

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### Smoke-Tree (*Cotinus*)

LEAF SPOT. *Cercospora rhoina*, AL; *Pezizella oenotherae*, MD; *Septoria rhoina*, CT, MA, NY, VA; *Gloeosporium* sp., IL.

ROT, Root. *Phymatotrichum omnivorum*, TX.

RUST. *Pileolaria cotini-cogyryiae*, GA, RI.

WILT. *Verticillium albo-atrum*, CT, IL, NE, NJ, NY.

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### Smoke-Tree (*Dalea*)

LEAF SPOT. *Cercospora daleae*, KS.

MISTLETOE. *Phoradendron californicum*, CA to TX.

ROT, Root. *Phymatotrichum omnivorum*, TX.

RUST. *Pileolaria cotini-cogyryiae*, AR; *Puccinia andropogonis* (0, I), SD to KS; II, III on *Andropogon*; *P. paroselae* (II, III), CA.

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### Snakeweed (*Polygonum*)

NEMATODE, Foliar. *Aphelenchoides fragariae*, SC.

ROT, Root. *Pythium helicoides*, FL.

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## Snapdragon (*Antirrhinum*)

ANTHRACNOSE. *Colletotrichum antirrhini*, general in eastern and southern states to CO and TX.

BACTERIAL Crown Gall. *Agrobacterium tumefaciens*, NY.

BLIGHT, Gray Mold. *Botrytis cinerea*, cosmopolitan in greenhouses.

BLIGHT, Southern; Stem Rot. *Sclerotium rolfsii*, CA, FL, MS, NJ, NY, TX.

CANKER, Stem and Crown. *Myrothecium roridum*, IL.

DAMPING-OFF; Root Rot. *Pythium* spp., cosmopolitan; *Rhizoctonia solani*, also collar rot.

DODDER. *Cuscuta* sp., WA.

DOWNY MILDEW. *Peronospora antirrhini*, CA, NY, OK, OR, PA.

LEAF SPOT. *Cercospora antirrhini*, FL, IL.

LEAF SPOT; Stem Rot; Canker. *Phyllosticta antirrhini*, general in eastern and North central states also TX and WA.

NEMATODE, LESION. *Pratylenchus pratensis*.

NEMATODE, Pin. *Paratylenchus penetrans*, CA.

NEMATODE, Root Knot. *Meloidogyne* spp., general in South and in northern greenhouses; *M. javanica*, MD.

NONPARASITIC. **Fasciation**. Probably genetic.

**Tip Blight**. Cause unknown CA, MD, OK, VA; injury from peach aphid.

PETAL SPOT. *Bipolaris (Helminthosporium) setariae*, FL.

POWDERY MILDEW. *Oidium* sp., MA, NY, PA.

ROT, Charcoal. *Macrophomina phaseoli*, OK.

ROT, Root. *Phymatotrichum omnivorum*, TX; *Thielaviopsis basicola*, CT, NJ.

ROT, Stem; Wilt. *Fusarium* sp., perhaps secondary; CT, FL, GA, OK, TN, WA; *Phytophthora cactorum*, CA, IL, MN, NJ, NY; *P. cryptogea*, CA, OK; *P. parasitica*, GA; *Sclerotinia sclerotiorum*, CA, IN, MI, PA, TX; *S. minor*, CT.

RUST. *Puccinia antirrhini* (II, III), general; 0, I unknown.

VIRUS. **Cucumber Mosaic, Mosaic**, unidentified, KS, NY, OH, PA; **Ring Spot**, unidentified, OK; **Impatiens Necrotic Spot**, NC.

WILT. *Verticillium albo-atrum*, CA, CT, ME, MA, MN, NY, NJ, PA.

Rust is the most generally important disease and can be prevented, to some extent, by purchasing rust-resistant seed, but not all such seed is resistant to all strains of rust.

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## Snowberry (*Symphoricarpos*)

ANTHRACNOSE; Black Berry Rot; Twig Canker. *Glomerella cingulata*, widespread, MA to VA, IL and WI.

BACTERIAL Crown Gall. *Agrobacterium tumefaciens*, MD.

BACTERIAL Hairy Root. *Agrobacterium rhizogenes*, IA.

LEAF SPOT. *Ascochyta symphoricarpophila*, NY; *Cercospora symphoricarpi*, MT, SD; *Phyllosticta symphoricarpi*, NM, NY, WA; *Lasiobotrys symphoricarpi*, black spot, CO, UT, WY; *Septoria oedospora*, CO; *S. signalensis*, WY; *S. symphoricarpi*, ND to CO, CA and WA.

POWDERY MILDEW. *Microspheera diffusa*, general; *Podosphaera oxycantha*, WA.

ROT, Berry. *Alternaria* sp., CO, CT, MA, NY; *Botrytis cinerea*, CT, MA, NY.

ROT, Collar. *Fomes ribis*, KS, MT.

ROT, Root. *Helicobasidium purpureum*, TX.

RUST. *Puccinia crandallii* (0, I), CA, CO, ID, MT, ND, UT, WA, WY; II, III on grasses; *P. symphoricarpi* (III), MT to CA, AK.

SPOT ANTHRACNOSE; Scab. *Sphaceloma symphoricarpi*, ME to VA, AR, CA, CO, OR, WA, WI.

Anthracnose and spot anthracnose, scab, commonly disfigure berries.

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## Snowdrop (*Galanthus*)

BLIGHT, Botrytis. *Botrytis galanthina* on imported bulbs.

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### Snow-on-the-Mountain (*Euphorbia marginata*)

BLIGHT, Gray Mold. *Botrytis cinerea*, NJ.

LEAF SPOT. *Alternaria* sp., KS, TX; *Cercospora euphorbiicola*, NE; *C. pulcherrimae*, OK; *Phyllosticta* sp., NJ.

POWDERY MILDEW. *Microsphaera euphorbiae*, IN, IA, KS, MO.

ROT, Root. *Phymatotrichum omnivorum*, TX.

RUST. *Puccinia panici* (0, I), MS to TX, CO, SD; *Uromyces euphorbiae*, IA, SD to TX, CO.

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### Soapberry, Southern (*Sapindus saponaria*)

BLIGHT, Thread. *Pellicularia koleroga*, FL.

LEAF SPOT; Dieback. *Glomerella cingulata*, FL; *Phyllosticta sapindii*, FL.

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### Soapberry, Western (*Sapindus drummondii*)

BLIGHT, Leaf. *Cylindrosporium griseum*, OK, TX.

LEAF SPOT; Dieback. *Glomerella cingulata*, TX; *Mycosphaerella sapindii*, MO.

MISTLETOE. *Phoradendron serotinum* (*flavescens*), AZ, NM, TX.

POWDERY MILDEW. *Uncinula circinata*, TX.

ROT, Root. *Helicobasidium purpureum*, TX.

VIRUS. *Mosaic*, TX.

This is one of the few plants reported resistant to Texas root rot.

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### Soapwort (*Saponaria*)

LEAF SPOT. *Alternaria saponariae*, also stem spot, CT to MD, IN, MN; *Cylindrosporium officinale*, IN; *Phyllosticta tenerrima*, NJ, TX; *Septoria noctiflorae*, IL.

ROT, Root. *Phymatotrichum omnivorum*, TX.

RUST. *Puccinia aristidae* (0, I), CO.

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### Society Garlic (*Tulbaghia*)

NEMATODE, Root Knot. *Meloidogyne incognita*, FL.

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### Solomons-Seal (*Polygonatum*)

LEAF SPOT. *Colletotrichum liliacearum*, secondary, cosmopolitan; *Sphaeropsis cruenta*, CT, IN, IA, NY, OH, VA, WI.

ROT, Rhizome. *Stromatinia smilacinae*, NY.

RUST. *Puccinia sessilis* (0 I), AL, CT, ID, IA, MN, NY, OH, PA, WI, WY; II, III on *Phalaris*; *Uromyces acuminatus* var. *magnatus* (0, I), IL, IA, MN, NE, ND, SD; II, III on *Spartina*.

SMUT, Leaf. *Urocystis colchici*, IA.

VIRUS. *Mosaic*. Unidentified, ME.

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### Solomons Seal, False (*Maianthemum racemosum*)

LEAF SPOT. *Cercospora idahoensis*, ID; *Cylindrosporium smilacinae*, CA, CO, OR, UT; *Heterosporium asperatum*, WY; *Phloeospora vagnerae*, MT; *Ramularia smilacinae*, MT, WY, WA; *Septoria smilacinae*, general; *Sphaeropsis cruenta*, CA, NM; *Phytophthora ramorum*, CA.

ROT, Rhizome. *Stromatinia smilacinae*, NY.

RUST. *Puccinia sessilis*, CA, ID, IA, KS, ND, SD, MT, NE, NY, OK, PA, WA; *Uromyces acuminatus* var. *magnatus*, CO, IL, MN, MT, NE, ND, SD, WI; II, III on *Spartina*.

SMUT, Leaf. *Urocystis colchici*, MT.

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### Sonchus

ROT. *Macrophomina phaseolina*, AZ.

VIRUS. *Sowthistle Yellow Vein*.

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### **Sophora (Pagoda Tree, Silky Sophora, Mescalbean)**

BLIGHT, Twig. *Nectria cinnabarina*, CT, NY.  
 CANKER. *Fusarium lateritium*, NJ.  
 DAMPING-OFF. *Rhizoctonia solani*, CT.  
 DIEBACK. *Diplodia sophorae*, OH.  
 LEAF SPOT. *Phyllosticta sophorae*, OK, TX.  
 MISTLETOE. *Phoradendron serotinum* (*flavescens*), TX.  
 NEMATODE, Root Knot. *Meloidogyne* sp., MD.  
 POWDERY MILDEW. *Microsphaera alni*, CT.  
 ROT, Root. *Phymatotrichum omnivorum*, TX.  
 RUST. *Uromyces hyalinus* (0, I, II, III), SD to TX, AZ, WY.  
 VIRUS. **Brooming Disease**. Unidentified.

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### **Sowthistle, Annual (*Sonchos oleraceus*)**

RUST. *Miyagia pseudosphaeria*, CA.  
 VIRUS. **Iris Yellow Spot**, GA.

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### **Soybean (*Glycine max*)**

ANTHRACNOSE. *Glomerella glycines*, IA, MI, NC to FL, NE, TX; *Colletotrichum truncatum*; *C. coccoades*, IL.  
 BACTERIAL Blight. *Pseudomonas syringae* pv. *glycinea*, East and South to MN, TX.  
 BACTERIAL, MLO. Bud Proliferation, LA.  
 BACTERIAL Leaf Crinkle. Unidentified, Midwest.  
 BACTERIAL Pustule; Pustular Spot. *Xanthomonas glycines* (*phaseoli* var. *sojense*), general.  
 BACTERIAL Tan Spot. *Clavibacter flaccumfaciens*, IA.  
 BACTERIAL Wildfire. *Pseudomonas tabaci*, MD to AL, LA, NE.  
 BACTERIAL Wilt. *Pseudomonas solanacearum*, NC.  
 BLIGHT, Aerial. *Rhizoctonia solani*, LA.  
 BLIGHT, Ashy Stem; Charcoal Rot. *Macrophomina phaseoli*, NJ to SC, NE, OH, TX, WA, WI.  
 BLIGHT, Gray Mold; Leaf Spot. *Botrytis cinerea*, CT, OH.

BLIGHT, Leaf. *Choanephora infundibulifera*, LA.  
 BLIGHT, Pod and Stem. *Diaporthe sojiae*, NY, MI, to GA, KS, LA.  
 BLIGHT. *Sclerotinia minor*, *S. sclerotiorum*, VA.  
 BLIGHT, Southern. *Sclerotium rolfsii*, VA to FL, IA, KS, TX.  
 CANKER, Stem. *Diaporthe phaseolorum* vars. *batatatis*, *meridionalis*, and *caulivora*, AR, FL, IL, IN, KY, LA, MD, OH, SC, TX, WI; *Phyllosticta sojicola*, AR, MD, stem and pod canker.  
 DAMPING-OFF. *Fusarium solani*, MN, ND.  
 DAMPING-OFF; Root Rot. *Pythium* spp., IL, IA, MN, MO, NC, ND; *P. aphanidermatum*; *P. torulosum*, IA; *P. delawarii*, OH; *Phytophthora megasperma* f. sp. *glycinea*, VA.  
 DECAY, Root, Stem. *Mycocleptodiscus terrestris*, WI.  
 DOWNY MILDEW. *Peronospora manshurica*, East and South to LA, IA.  
 LEAF SPOT. *Alternaria* sp., widespread, secondary; *Cercospora canescens*, also on pods, stems, AL, IL, MD, MS, NC, TX, WV; *C. kikuchii*, also purple stain of seed, IN, MD, NC, VA; *C. sojina*, frog-eye leaf spot, MI to FL, IA, NY, OK, VA, WI, Argentina; *Corynespora cassiicola* (*Helminthosporium vignicola*), target spot, AL, AR, FL, GA, LA, MN, MS, NC, SC; *Helminthosporium vignae*, zonate leaf spot, NC; *Mycosphaerella cruenta*, GA, MS; *Myrothecium roridum*, secondary, LA; *Phyllosticta glycinea*, IL, MD, MO, NC, VA; *Pleosphaerulina sojicola*, ME, NJ, NY, WI.  
 LEAF SPOT, Brown Spot. *Septoria glycines*, AR, DE, IN, IA, MD, NC, WI.  
 LEAF and STEM DISEASE. *Cercospora zebrina* (clover isolate), NC.  
 MOLD, White. *Sclerotinia sclerotiorum*, ME.  
 NEMATODE, Cyst. *Heterodera glycines*, soybean cyst, AR, IA, KS, KY, LA, MI, MN, MO, NE, NC, ND, OH, SD, TN, TX; *H. gottingiana*, peacyst; *H. trifolii*, clover cyst; *Cactodera estonica*, WI.

- NEMATODE, Dagger. **Longidorus** sp.
- NEMATODE, Lesion. **Pratylenchus safaenis**, GA.
- NEMATODE, Root Knot. **Meloidogyne hapla**; **M. javanica**.
- NEMATODE, Spiral. **Helicotylenchus erythrinae**; **H. nannus**.
- NEMATODE, Stem. **Ditylenchus dipsaci**, NY.
- NEMATODE, Sting. **Belonolaimus gracilis**; **B. longicaudatus**, DE.
- NONPARASITIC. **Baldhead**. Mechanical injury.
- Chlorosis**. Interveinal. Manganese deficiency, AL, NC, TN.
- Yellowing**. Potassium deficiency, iron deficiency.
- PHYTOPLASMA, Stunting, Small Leaves, Aborted Seed Pods, Costa Rica.
- POWDERY MILDEW. **Erysiphe polygoni**, DE, IA, NC, SC; **Microsphaera diffusa**, DE, MN, NC.
- ROOT DEATH, Yellowing and Stunting. **Phytophthora sansomeana**, OR.
- ROT, Charcoal. **Macrophomina phaseolina**, IA, MN, ND.
- ROT, Red Crown. **Cylindrocladium crotalariae**, Telemorph, **Calonectria crotalariae**, MS.
- ROT, Root. **Corynespora cassiicola**, WI; **Phymatotrichum omnivorum**, TX; **Pythium aphanidermatum**, AZ; **P. dissotocum**, AZ; **Stachybotrys chartarum**, IL; **Fusarium oxysporum**, **F. solani**, **F. acuminatum**, **F. proliferatum**, IA, MN; **F. redolens**, MN; **F. tricinctum**, MN.
- ROT, Root Black. **Thielaviopsis basicola**, AR.
- ROT, Root and Stem. **Fusarium virguliforme**, MN; **Phytophthora megasperma** f. sp. **glycinea**, DE, Northeast, MN, SD; **P. sojae**, AR, IL, MN, ND.
- ROT, Seed. **Fusarium scirpi**, NE; **F. graminearum**, IL; **Nematospora coryli**, NC, OK, SC, VA; **Aspergillus** spp; **Phomopsis sojae**, NY.
- ROT, Stem. **Cephalosporium gregatum**, brown stem, IL, IN, IA, KY, MN, MO, NC, OH, VA; **Pellicularia filamentosa**, also root rot, canker, general; **Sclerotinia sclerotiorum**, AZ, IA, MD, NY, VA; **Phytophthora megasperma** var. **sojae**; **Neocosmospora vasinfecta**, AL.
- RUST. **Phakopsora pachyrhizi**, AL, AR, FL, GA, HI, IL, IN, IA, KY, LA, MD, MS, MO, NE, NC, SC, TN, TX, VA, Cuba, Yucatan Peninsula, Mexico; **P. packopsora**, VA, Mexico.
- SEED INFECTION. **Phomopsis longicolla**, IA.
- SUDDEN DEATH SYNDROME. **Fusarium solani** f. sp. **glycines**, AR, DE, IA, KY, MN, MO, NE, OH, PA; **F. tucumaniae**, Argentina; **F. virguliforme**, MI, WI; **Phoma** sp.; **Epicoccum** sp.; **Alternaria** sp., **Trichoderma** sp., MO.
- VIRUS. **Soybean Mosaic**, ND; **Tobacco Ring Spot**, causing bud blight, midwestern U.S.; **Beet Curly Top**; **Bean Pod Mottle**, NE; **Soybean Yellow Mosaic**, Midwest; **Cowpea Mosaic**, IL; **Tobacco Streak**, OK; **Soybean Dwarf**, CA, IL, WI; **Tobacco Mosaic**; **Pepper Golden Mosaic**, Mexico; **Bean Pod Mottle**, AL, Ontario, Canada; **Tomato Spotted Wilt**, AL, GA; **Rhynchosia Golden Mosaic**, Mexico; **Iris Yellow**, **Bunyaviridae**, FL, GA; **Soybean Yellow Mottle Mosaic**, MS; **Soybean Vein Necrosis**, TN; **Alfalfa Mosaic**, **Alfamovirus**, TN.
- WILT. **Fusarium oxysporum** f. sp. **tracheiphilum**, PA to FL, NE, TX; also CA.
- Edible soybeans are well-suited to home garden culture and usually produce a good crop without control measures beyond dusting seed with a protectant before planting. Commercial growers find a number of diseases of economic importance; bacterial pustule, the various blights, leaf spots, downy mildew, wildfire, virus diseases. Some areas are now under quarantine for the soybean cyst nematode.

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### Spanish Moss (*Tillandsia*)

BLIGHT, Stem and Leaf. **Fusarium solani**. Southeast, U.S.

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### Sparaxis (*Wandflower*)

VIRUS. **Iris Mosaic**, CA, OR.

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## Spathiphyllum

LEAF SPOT. *Myrothecium roridum*, FL.

NECROTIC LESIONS. *Pectobacterium carotovorum* subsp. *carotovorum*, Argentina.

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## Specularia (Venus Looking-Glass)

DODDER. *Cuscuta* sp., TX.

GALL, Leaf. *Synchytrium* sp., TX.

LEAF SPOT. *Cercospora speculariae*, LA; *Septoria speculariae*, KS, PA to AL, TX, WI.

ROT, Root. *Phymatotrichum omnivorum*, TX.

RUST. *Coleosporium campanulae* (II, III), NC, PA.

SMUT, Seed. *Ustilago speculariae*, OK.

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## Sphacele (Pitcher-Sage)

RUST. *Uredo sphacelicola* (II), CA.

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## Spice-Bush (*Lindera*)

CANKER. *Botryosphaeria ribis* var. *chromogena*, MD.

LEAF SPOT. *Phyllosticta linderae*, DE, IN, WV; *P. lindericola*, WV.

MISTLETOE. *Phoradendron serotinum* (*flavescens*), eastern states.

ROT, Root. *Phymatotrichum omnivorum*, TX.

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## Spider-Lily (*Hymenocallis*)

LEAF BLOTCH; Red Spot. *Stagonospora curtisii*, CA, TX.

LEAF SPOT. *Cercospora amaryllidis*, TX; *C. pancratii*, FL, LA, TX; *Gloeosporium hemerocallidis*, TX.

NEMATODE, Spiral. *Rotylenchus blaberus*.

VIRUS. Mosaic. Unidentified, CA.

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## Spiderling, Wine-Flower (*Boerhaavia*)

BACTERIAL Leaf Spot. *Xanthomonas campestris*, TX.

LEAF SPOT. *Ascochyta boerhaaviae*, TX; *Cercospora boerhaaviae*, TX.

NEMATODE, Root Knot. *Meloidogyne* spp.

ROT, Root. *Phymatotrichum omnivorum*, TX.

WHITE RUST. *Albugo platensis*, AZ, FL, NM, TX.

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## Spinach (*Spinacea*)

ANTHRACNOSE. *Colletotrichum spinaciae*, CT, LA, MS, NJ, NY, TX, VA; *C. spinicola* (*Gloeosporium spinaciae*); *C. dematium*, CA.

BACTERIAL Leaf Spot. *Pseudomonas syringae* pv. *syringae*, CA.

BACTERIAL, MLO. Aster Yellows.

BACTERIAL Soft Rot. *Erwinia carotovora*, general in transit, market.

BLIGHT, Phytophthora. *Phytophthora capsici*, IL.

DAMPING-OFF; Root Rot. *Rhizoctonia solani*, general; *Pythium* spp., preemergence seed decay.

DOWNY MILDEW. *Peronospora effusa*, general; *P. farinosa* f. sp. *spinaciae*, AZ, AR, CA, FL.

LEAF SPOT. *Cercospora beticola*, CA, GA, IL, IA, MA, NY, TX; *Phyllosticta chenopodii*, DE, NJ, NY, VA; *Stagonospora spinaciae*, SD; *Alternaria spinaciae*, MA; *Stemphylium botryosum*, AZ, CA, DE, MD; *Cladosporium variabile*, WA; *Bipolaris* sp., FL.

MOLD, Leaf. *Cladosporium macrocarpum*, secondary, DE, OK, PA, TX; *Heterosporium variabile*, pinhead "rust," general.

MOLD, Seed. *Pleospora herbarum* (*Stemphylium botryosum*); *Alternaria* sp., and secondary leaf spot; *Curvularia inaequalis*.

NECROTIC, Circular Tan Leaf. *Stemphylium botryosum*, TX.

NEMATODE. Clover Cyst. *Heterodera trifolii*.

NEMATODE, Root Knot. *Meloidogyne* spp.

NONPARASITIC. Yellows. Nutrient deficiency.



ROT, Root. **Aphanomyces cladogamus**, NJ, VA; **Phymatotrichum omnivorum**, TX; **Pyrenochaeta terrestris**, IA; **Olpidium brassicae**.

ROT, Root, Crown; Wilt. **Fusarium solani**; **F. oxysporum** f. sp. **spinaciae**, general; **Phytophthora** sp., AZ, IN, NJ, NY; **P. cryptogea**, CA; **P. megasperma**, CA, NC; **Sclerotinia sclerotiorum**, GA, NY.

RUST. **Puccinia aristidae** (0, I), AZ, CA, CO, OR, WA; II, III on grasses.

SMUT, Leaf. **Entyloma ellisii**, NJ, WA.

VIRUS. **Cucumber Mosaic** (Spinach Blight); **Spinach Yellow Dwarf**; **Beet Curly Top**; **Beet Ring Mottle**; **Beet Pseudo Yellows**; **Tomato Spotted Wilt**; **Lettuce Mosaic**, NY; **Lettuce Speckles Mottle**, CA; **Spinach Latent**; **Potato Leaf Roll**, Pacific Northwest; **Spinach Severe Curly Top**, AZ; **Impatiens Necrotic Spot**, CA; **Bean Yellow Vein**, CA; **Curtoviruses**, AZ; **Tobacco Rattle**, CA.

WHITE RUST. **Albugo occidentalis**, AR, OK, TX.

WILT. **Verticillium** sp., NY.

Downy mildew is the outstanding spinach disease, with all varieties susceptible in some degree because of physiologic races, although Dixie Market, Savoy Supreme, and others are considered resistant. To reduce blight, use virus-tolerant varieties.

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### **Spiraea (Native Hardhack, Meadowsweet)**

BLIGHT, Seedling; Stem Girdle. **Thelephora terrestris**, ID.

CANKER. **Cryptodiaporthe macounii**, NY.

LEAF SPOT. **Cercospora rubigo**, CA, KS, OR, WI; **Cylindrosporium** spp., ID, NY; **Phloeospora salicifoliae**, NY to KS, TX, WA.

POWDERY MILDEW. **Podosphaera oxycanthae**, widespread; **Sphaerotheca macularis**, CT, MI, NY, PA.

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### **Spirea, Oriental Flowering (*Spirea*)**

BACTERIAL Fire Blight. **Erwinia amylovora**, MD, NJ, NC, VA.

BACTERIAL Hairy Root. **Agrobacterium rhizogenes**, IA.

LEAF SPOT. **Cylindrosporium filipendulae**, IA, OR, WA, WI.

NEMATODE, Root Knot. **Meloidogyne** spp., FL, MS; **M. hapla**.

POWDERY MILDEW. **Microsphaera alni**, CT; **Podosphaera oxycanthae**, widespread; **Sphaerotheca macularis**, TX.

ROT, Root. **Phymatotrichum omnivorum**, AZ, TX.

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### **Spondias (Mombin)**

NEMATODE, Root Knot. **Meloidogyne** sp., FL.

SPOT ANTHRACNOSE; Mombin Scab. **Sphaceloma spondiadis**, FL.

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### **Spruce (*Picea*)**

BLIGHT, Brown Felt. **Herpotrichia nigra**, MT, Northern Rocky Mts., Pacific Northwest; **Neopeckia coulteri**.

BLIGHT, Needle. **Sirula macrospora**, ND; **Stigmina lautii**, NC.

BLIGHT, Seedling Smother. **Thelephora terrestris**, ID, MN, OH; seedling, **Rosellinia herpotrichioides**, WA.

BLIGHT, Shoot. **Sirococcus strobilinus**, KS, NC, WI; **Phomopsis occulta**, WI.

BLIGHT, Snow. **Phacidium infestans**, New England states; **Botrytis cinerea**, NJ; **Lophophacidium hyperboreum**, MN.

BLIGHT, Twig. **Ascochyta piniperda**, ME, NC.

BROOMING. **Rhizosphaera kalkhoffii**, Central Rocky Mts.

CANKER, Bark. **Aleurodiscus amorphus**, widespread.

CANKER; Twig Blight. **Cytospora kunzei** (*Valsa kunzei* var. *piceae*), New England to NJ, IL, MN.

DAMPING-OFF. **Cylindrocladium scoparium**, MI, NJ; **Phytophthora cinnamomi**, MD, NY, VA; **P. cactorum**, NY, VA; **Pythium ultimum**,



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**Spurge Leafy (*Euphorbia escula*)**

LEAF SPOT; Blight. *Alternaria angustiovoidea*.  
 ROT, Crown and Root. *Fusarium oxysporum*;  
*F. solani*; *F. proliferatum*, MT.

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**Spurge, Painted (*Euphorbia heterophylla*)**

CANKER, Stem. *Diaporthe phaseolarum*  
 var. *caulivora*, LA; pathogen of soybean  
 stem canker.  
 RUST. *Uromyces euphorbiae* (0, I, II, III), IN to  
 FL, KS, TX.  
 SMUT, Stem. *Tilletia euphorbiae*, LA.  
 VIRUS. *Euphorbia Mosaic*, FL.

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**Spurge, Prostrate (*Euphorbia supina*)**

CANKER, Girdling Stem; Gray Mold. *Amphobotrys*  
*ricini*, FL, LA, MD, MS, OK, TX.

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**Spurge, Spotted (*Euphorbia maculata*)**

NEMATODE, Root Knot. *Meloidogyne hapla*.

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**Squash and Pumpkin (*Cucurbita*)**

ANTHRACNOSE. *Colletotrichum lagenarium*, CT  
 to NJ, KS, TX.

BACTERIAL, MLO. *Aster Yellows*.

BACTERIAL Soft Rot. *Erwinia carotovora* pv.  
*carotovora*, cosmopolitan; *E. aroideae*.

BACTERIAL Spot. *Xanthomonas cucurbitae*, CT,  
 GA, IL, IN, MD, MA, MI, WA, WI; *Pseudo-*  
*monas syringae* pv. *lachrymans*; *P. syringae*  
 pv. *syringae*, GA.

BACTERIAL Wilt. *Erwinia tracheiphila*, NM.

BLIGHT, Blossom. *Choanephora cucurbitarum*,  
 brown rot of fruit, ME to FL, MI, OK, TX.

BLIGHT, Gummy Stem; Black Rot of Fruit.  
*Mycosphaerella citrullina* (*M. melonis*),  
 CT, FL, GA, MA, MI, NJ, NY.

BLIGHT, Leaf. *Alternaria cucumerina*, DE, MN,  
 NJ, NY, NC, UT; *Phytophthora capsici*, also  
 stem rot, fruit rot, AR, CA, IL, NM, NC, TX.

BLIGHT, Southern. *Sclerotium rolfsii*, AL,  
 FL, GA.

BLIGHT, Stem. *Fusarium tabacinum*  
 (*Plectosporium tabacinum*), AL, IL, NY, TN.

DAMPING-OFF. *Pythium debaryanum*, CT, WI.

DOWNY MILDEW. *Pseudoperonospora cubensis*,  
 ME to AL, CA, IA, LA, TX.

LEAF NECROSIS AND TWIG CANKER. *Pseudomonas*  
*syringae*, *Pseudomonas marginolis*, Quebec,  
 Canada.

LEAF SPOT. *Ascochyta* sp.; *Cercospora*  
*cucurbitae*, AL, DE, NJ, WI; *C. citrullina*,  
 AL; *Gloeosporium* sp., IL; *Phyllosticta*  
*cucurbitarum*, IN, NY; *P. orbicularis*, DE,  
 PA, NY; *Septoria cucurbitacearum*, IL,  
 MA, NY, WI; *Stemphylium*  
*cucurbitacearum*, IN, OH.

MOLD, Seed. *Alternaria tenuis*, cosmopolitan;  
*A. radicina*, occasional; *Curvularia trifolii*,  
 CT.

NEMATODE, Root Knot. *Meloidogyne* spp., MD to  
 FL, TX.

NEMATODE, Stubby Root. *Trichodorus christiei*.

NONPARASITIC. Blossom-End Rot. On summer  
 squash when hot, dry weather follows a cool,  
 rainy spell.

Chlorosis. Nutrient deficiency: manganese,  
 interveinal chlorosis, nitrogen, leaf yellowing  
 and chlorosis of bud end of fruit.

Bronzing. Marginal Necrosis; Fruit Deformity.  
 Potassium deficiency.

POWDERY MILDEW. *Golovinomyces*  
*cichoracearum*, general; *Sphaerotheca*  
*fuliginea*, CA, IN, MI, NY, NC.

ROT, Blossom-end; Root, *Pythium*  
*aphanidermatum*, AZ, CA, MD.

ROT, Charcoal. *Macrophomina phaseolina*, OR,  
 TX.

ROT, Fruit. *Acidovorax avenae* (syn. *Pseudo-*  
*monas pseudoalcaligenes* subsp. *citrulli*),  
 GA; *Alternaria* sp., MA, NH, NJ, NY, OR,  
 VT, WA; *Diplodia natalensis*, TX;  
*Coniosporium fairmani*, black mold; *Botry-*  
*tis cinerea*, gray mold; *Fusarium* spp.;  
*F. solani*, AR, *F. solani* f. sp. *cucurbitae*,

also root and stem rot, CA, CT, NY, OR, WA; **F. equiseti**, AR, CT; **F. acuminatum**, CT; **F. graminearum**, CT; **F. avenaceum**, CT; **Phytophthora cactorum**, AZ; **P. nicotianae**, NC; **Pythium ultimum**, CA; **Rhizopus stolonifer**, general in storage after injury; **Sclerotinia sclerotiorum**, ID, MA, ME, NH, NY, WA; **Trichothecium roseum**, pink mold, MA; **Phoma subvelata**, also leaf spot, stem rot, TX.

ROT, Root. **Phymatotrichum omnivorum**, TX; **Rhizoctonia solani**, TX.

SCAB; Leaf Spot; Storage Rot. **Cladosporium cucumerinum**, CT, MD, MA, NJ, NY, OR, WA.

VIRUS. **Bromegrass Mosaic**. General, IA, SD on squash (*Cucurbita pepa*); **Lettuce Mosaic**, NY; **Squash Mosaic**, CA, SD; **Southern Squash Mosaic**; **Cucumber Mosaic**; **Beet Curly Top**; **Tobacco Ring Spot**; **Prunus Ring Spot**; **Watermelon Mosaic**; **Zucchini Yellow Mosaic**, AR, CA, CT, FL, LA, NJ, NY, OH, SC; **Squash Leaf Curl**, CA; **Lettuce Infectious Yellows**, AZ, CA, TX; **Cucurbit Leaf Curl**, AZ, FL, TX, Mexico; **Beet Pseudo Yellows**, CA; **Potato Leaf Roll**, Pacific Northwest; **Cucurbit Yellow Stunting**, AZ, Mexico.

WILT. **Fusarium oxysporum** f. sp. **niveum**, CA, IL, MI, WI; **Verticillium albo-atrum**, OR.

WILT, Anasa. Feeding injury from the squash bug. In general, diseases and control measures are the same as for cucumbers. Some squash varieties are injured by sulfur dusts. Acorn and butternut squashes are resistant to bacterial wilt.

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### Squash-Bush (*Condalia*)

MISTLETOE. **Phoradendron californicum**, CA.

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### Squaw-Apple (*Peraphyllum*)

LEAF SPOT. **Septoria peraphylli**, UT.

RUST. **Gymnosporangium inconspicuum** (0, I), CO; III on juniper; **G. nelsonii** (0, I), on leaves, fruit; CO, UT.

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### Stachys (Betony, Hedge-nettle, Woundwort)

GALL, Leaf. **Synchytrium stachydis**, LA.

LEAF SPOT. **Cercospora stachydis**, IA, ME; **Cylindrosporium stachydis**, IL; **Ovularia bullata**, CA; **Phyllosticta decidua**, MA, WI; **P. palustris**, IL, OH; **Ramularia stachydis**, OR; **Septoria stachydis**, CA, IL, MS, NY, WI.

NEMATODE, Root Knot. **Meloidogyne** sp.

POWDERY MILDEW. **Erysiphe galeopsidis** (*Golovinomyces cichoracearum*), OH to CO, MT, NY to IN, WI; **Sphaerotheca macularis**, CA.

RUST. **Puccinia pallidissima**, TX.

VIRUS. **Tomato Spotted Wilt**, GA.

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### Staphylea (Bladdernut)

BLIGHT, Twig. **Hypomyces ipomoeae**, MA; **Coryneum microstictum**, MA.

LEAF SPOT. **Mycosphaerella staphylina**, GA, KS. **Ovularia isarioides**, NY to MO, IA; **Septoria cirrhosa**, MO.

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### Starbur, Bristly (*Acanthospermum*)

VIRUS. **Tomato Spotted Wilt**, GA.

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### Starflower (*Trientalis*)

GALL, Leaf. **Synchytrium aureum**, PA.

LEAF SPOT. **Cylindrosporium magnusianum**, CA, MA, MI, NY, WI; **Septoria increscens**, CA, ME, MI, NY, VT, WI; **Phytophthora ramorum**, CA.

ROT, Leaf. **Ceratobasidium anceps**, WI.

RUST. **Puccinia caricina** var. **limosae** (0, I), AK, NY, WI; II, III on *Carex*.

SMUT, Leaf and Stem. **Tubercinia trientalis**, OR, WA.

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**Stargrass (*Aletris*)**

LEAF SPOT. *Gloeosporium aletridis*, MS.  
 RUST. *Puccinia aletridis* (II, III), DE, FL, IL, IN,  
 MA, MS, NJ, NC, RI, SC, TN, WI; 0, I  
 unknown.

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**Stargrass, Golden (*Hypoxis*) Grass-like**

LEAF SPOT. *Cylindrosporium guttatum*, WI;  
*Septoria hypoxis*, PA.  
 RUST. *Uromyces affinis* (I, III), CT, MS, MO; *U.*  
*necopinus*, NY.  
 SMUT, Flower. *Urocystis hypoxis*, CT, MA.

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**Star-of-Bethlehem (*Ornithogalum*)**

BLIGHT, Southern. *Sclerotium rolfsii*, CA.  
 LEAF SPOT. *Didymellina ornithogali*, IL, PA,  
 WA; *Septoria ornithogali*, CT, MA.  
 VIRUS. *Ornithogalum Mosaic*, AL, OK, OR.

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**Statice, Sea-Lavender (*Limonium*)**

ANTHRACNOSE; Rot, Crown. *Colletotrichum*  
*gloeosporioides*, FL.  
 BACTERIAL, Crown and Leaf Rot. *Pseudomonas*  
*caryophylli*, FL.  
 BACTERIAL, MLO. California Aster Yellows,  
 CA.  
 BACTERIAL Spot. *Pseudomonas andropogonis*, KS.  
 BACTERIAL, MLO. Yellows and Phyllody, MI.  
 BLIGHT, Flower. *Botrytis cinerea*, FL.  
 DOWNY MILDEW. *Peronospora statices*, CA.  
 LEAF SPOT. *Alternaria* sp., CT; *Cercospora* sp.,  
 TX; *C. insulana*, FL; *Ascochyta*  
*plumbaginicola*, IA; *Fusicladium staticis*,  
 TX; *Phyllosticta* sp., CT; *P. staticis*, NY.  
 NEMATODE, Root Knot. *Meloidogyne* sp.  
 ROT, Crown. *Sclerotium rolfsii*, FL; *Rhizocto-*  
*nia solani*, FL.  
 RUST. *Uromyces limonii* (0, I, II, III), ME to MS  
 CA, NM, TX.  
 VIRUS. *Turnip Mosaic*, CA.

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**Stenanthium**

RUST. *Puccinia atropuncta* (II, III), GA;  
*P. grumosa*, OR.

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**Stenolobium (Florida Yellow-  
Trumpet)**

ROT, Root. *Clitocybe tabescens*, FL;  
*Phymatotrichum omnivorum*, TX.  
 RUST. *Prosopodium appendiculatum* (0, I, II,  
 III), FL, TX.

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**Stephanomeria (Wire-Lettuce)**

LEAF SPOT. *Cercospora clavicarpa*, CA.  
 RUST. *Puccinia harknessii* (0, I, III), MT to NM,  
 CA, WA.

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**Stephanotis (Woody Vine)**

ANTHRACNOSE. *Gloeosporium* sp., WA.  
 BLIGHT, Flower. *Botrytis elliptica*, CA.  
 VIRUS. *Tomato Spotted Wilt*, OR.

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**Sternbergia (Fall-Daffodil)**

LEAF SCORCH; Red Spot. *Stagonospora curtisii*,  
 CA.

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**Stevia (*Piqueria*)**

BACTERIAL Fasciation. *Clavibacter fascians*,  
 MI.  
 BACTERIAL, MLO. Aster Yellows, MI, NJ.  
 DAMPING-OFF. *Rhizoctonia solani*, IL.  
 NEMATODE, Lesion. *Pratylenchus pratensis*,  
 NJ.  
 POWDERY MILDEW. *Golovinomyces*  
*cichoracearum*, IL.  
 ROT, Stem. *Sclerotium rolfsii*, NJ.  
 WILT. *Verticillium dahliae*, CA.

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## Stillingia (Queens Delight)

DODDER. *Cuscuta* sp., OK.

LEAF SPOT. *Cercospora stillingiae*, TX.

ROT, Root. *Phymatotrichum omnivorum*, TX.

RUST. *Uromyces graminicola* (0, I), OK; II, III  
on *Panicum*.

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## Stock (*Matthiola*)

ANTHRACNOSE; Leaf and Stem Spot.  
*Colletotrichum gloeosporioides*, TX.

BACTERIAL Black Rot. *Xanthomonas incanae*,  
CA, TN.

BLIGHT, Gray Mold. *Botrytis cinerea*, AK, TX.

CLUB ROOT. *Plasmidiophora brassicae*, NJ.

DAMPING-OFF. *Pythium* spp.; *Rhizoctonia*  
*solani*, cosmopolitan.

DOWNY MILDEW. *Peronospora parasitica*, CA, IL.

LEAF SPOT. *Alternaria raphani*, CA;  
*Myrothecium roridum*, TX.

NEMATODE. *Nacobus batatiformis*.

NEMATODE, Root Knot. *Meloidogyne* sp., TX.

ROT, Crown; Wilt. *Sclerotinia sclerotiorum*,  
CA, MI, PA.

ROT, Root. *Fusarium avenaceum*, DE, NJ;  
*Phymatotrichum omnivorum*, TX;  
*Phytophthora megasperma*, CA;  
*P. cryptogea*, stem rot, CA.

VIRUS. Turnip Mosaic; Cauliflower Mosaic; Beet  
Curly Top, CA; Tomato Spotted Wilt, TX.

WILT. *Fusarium oxysporum* f. sp. *mathioli*, AZ,  
CA; *Verticillium alboatrum*, CA, NY.

Mosaic causes flower-breaking as well as mot-  
tling of foliage. Verticillium wilt is prevalent in  
cut-flower producing areas of California.

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## Stokesia (Stokes-Aster)

BLIGHT, Head. *Botrytis cinerea*, NY.

LEAF SPOT. *Ascochyta* sp., IA, PA.

POWDERY MILDEW. *Golovinomyces*  
*cichoracearum*, MD.

VIRUS. Mosaic. Unidentified, IA; *Bidens Mottle*,  
FL.

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## Stone Plant (*Lithops*)

ROT. *Fusarium oxysporum*, ID.

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## Stranvaesia

BACTERIAL Fire Blight. *Erwinia amylovora*, NJ.

ROT, Root. *Clitocybe tabescens*, FL.

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## Strawberry (*Fragaria*)

ANTHRACNOSE; Crown Rot. *Colletotrichum*  
*acutatum*, CT; *C. fragariae*, FL, LA;  
*Gloeosporium* sp., MD.

ANTHRACNOSE, Fruit. *Colletotrichum*  
*gloeosporioides*, FL, OH; *C. acutatum*, NY.

BACTERIAL Angular Leaf Spot. *Xanthomonas*  
*fragariae*, FL, KY, MN, WI.

BACTERIAL Blossom Blight. *Xanthomonas*  
*campestris* var. *fragariae*, CA; *Pseudomo-*  
*nas marginalis*, CA.

BACTERIAL, Phytoplasma. Aster Yellows, straw-  
berry green petal; Lethal Disease Decline or  
Peach Western X Disease. WA, OR; Clover  
Proliferation, CA, FL, MD; Clover Yellow  
Edge and STRAWB2, MD.

BACTERIAL Soft Rot. *Erwinia carotovora*, MA.

BLIGHT, Blossom. *Cladosporium*  
*cladosporioides*, CA.

BLIGHT, Gray Mold. *Botrytis cinerea*, general on  
fruit.

BLIGHT, Leaf. *Dendrophoma obscurans*, angular  
leaf spot, MA, to FL, MI, MN, NE, OR, TX;  
*Phomopsis obscurans*, CT.

BLIGHT, Southern. *Sclerotium rolfsii*, AL, FL,  
NC, TX.

BROOMRAPE. *Orobanche* sp., WA.

DOWNY MILDEW. *Peronospora fragariae*, IA.

GALL, Leaf. *Synchytrium aureum*, on native  
spp., WI; *S. fragariae*, root gall, CA, WA.

LEAF BLOTCH. *Gnomonia fructicola*, also fruit  
rot; *G. comari*, CA.

LEAF SCORCH. *Diplocarpon earliana*, general.

LEAF SPOT. *Cercospora fragariae*, LA;  
*C. vexans*, CA, NY, WI; *Gloeosporium* sp.,

IL, MA, MI, NC, PA, UT, associated with black root; **Mycosphaerella fragariae**, common leaf spot, black-seed disease, general; **M. louisianae**, purple leaf spot, LA, MS, NC.

NEMATODE, Dagger. **Xiphinema americanum**; **X. diversicaudatum**; **X. chambersi**.

NEMATODE, Leaf and Stem. **Ditylenchus dipsaci**, CA, ID, NC, OR, TX, WA.

NEMATODE, Lesion. **Pratylenchus penetrans**; **P. coffeae**; **P. pratensis**; **P. scribneri**.

NEMATODE, Root Knot. **Meloidogyne hapla**.

NEMATODE, Spring Dwarf. **Aphelenchoides fragariae**, MA to FL, AR, CA, MI, TX, TN, WA; Summer Dwarf, Crimp. **A. besseyi**, southeastern and Gulf states, also AR, CA, DE, IL, TX.

NEMATODE, Sting. **Belonolaimus gracilis**.

NEMATODE, Stubby Root. **Trichodorus christiei**.

NONPARASITIC. **Black Root, Brown Root**. Winter injury, defective drainage, soil toxins, widespread.

**Chlorosis**. Iron deficiency.

**Variation**, June Yellows. Chlorophyll deficiency, especially in Blake more, Progressive, and related varieties, general.

POWDERY MILDEW. **Sphaerotheca macularis**, general but rare in South, reported in FL, CA.

ROT, Crown. **Phytophthora cactorum**, NY; **Sclerotinia sclerotiorum**, MD to FL, CA, IL, IA, MN, TX; **Sclerotium rolfsii**, AL, FL, NC, TX; **Macrophomina phaseolina**, CA, FL, Argentina.

ROT, Fruit. **Penicillium** spp., secondary; **Pezizella lythri**, also leaf spot, root rot, ME to FL, AK, IL, IA, MI, OH, OK, OR, WI; **Phytophthora cactorum**, leather rot, AL, AR, IL, KY, LA, MD, MI, MO, OH, TN, VA; **Rhizopus nigricans**, black rot, cosmopolitan; **Rhizoctonia solani**, hard brown rot, widespread; **Sphaeropsis** sp., CA, CO, IL, IA, MN.

ROT, Gray Mold. **Botrytis cinerea**, SC.

ROT, Red Stele; Brown Core Root Rot. **Phytophthora fragariae**, ME to VA, IA, OK; also CO, MI, WI, Pacific states.

ROT, Root. **Armillaria mellea**, CA, OR, WA; **Cylindrocladium scoparium**, OR, TN; associated with black root; **Leptosphaeria**

**coniothyrium**; **Fusarium** spp.; **Olpidium brassicae**, WA; **Pythium** spp., widespread; **Ramularia** spp., ID, OR, WA; **Idriella lunata**, CA, MD; **Phomopsis obscurans**, OH; **Macrophomina phaseolina**, FL, Argentina.

ROT, Root, Stolon and Petiole. **Pestalotia longisetula**, IL, OR.

SLIME MOLD. **Diachea leucopodia**, CA, IL, KS, LA, MS, MO, TN, TX; **Fuligo septica**, IA, KS, MN, NE, NJ, TX, WA; **Mucilago spongiosa**, KS, MN, MO, NE, OK; **Physarum cinereum**, IL, NE, NJ.

SOOTY MOLD. **Scoria spongiosa**, ME.

VIRUS. **Strawberry Crinkle**, CA, ID, MN, NY, OR, WA; **Strawberry Yellow Edge**, Xanthosis, CA, NC, OR, WA, and other states introduced from West Coast; **Strawberry Leaf Roll**, MD, NJ, NY, OR, VT; **Strawberry Mottle**; **Strawberry Multiplier Disease**, WI; **Strawberry Necrotic Shock**, CA; **Strawberry Pallidosis**, CA, OR, Mid-Atlantic, British Columbia, Canada; **Strawberry Pseudo Mild Yellow Edge**; **Strawberry Mild Yellow Edge**, CA; **Strawberry Vein Necrosis**, MN; **Strawberry Vein Banding**; **Strawberry Witches' Broom**, ID, MN, MT, NY, OR, WA; **Tomato Ringspot**, PA; **Apple Mosaic**, OR; **Chlorotic Peacock Pattern**, OR; **Cucurbit Yellows**, OR; **Strawberry Phyllody**, MD, WV; **Tobacco Streak**, MD.

WILT. **Verticillium albo-atrum**, CA, FL, NY, OR, WA; **Colletotrichum acutatus**, AR, CA, FL, MS, MO; **Fusarium oxysporum**, CA.

Red Stele is, except in the deep South, of first importance on strawberries. The roots rot, and above-ground parts are stunted and wilted. Choose resistant varieties, such as Stelemaster, Sparkle, Surecrop, Midway, and Fairland. Purchase plants certified free from nematodes and virus diseases. Mulching helps to prevent fruit rots.

U.S. Department of Agriculture Farmers' Bulletin 1891 gives an excellent discussion of "Diseases of Strawberries". The American Phytopathological Society, St. Paul, MN has published a Compendium of Strawberry Diseases.

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### Strawberry-Tree (*Arbutus unedo*)

BACTERIAL Crown Gall. *Agrobacterium tumefaciens*, CA.

LEAF SPOT. *Septoria unedonis*, OR.

SPOT ANTHRACNOSE. *Elsinoë mattirolianum*, CA.

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### Strawflower (*Helichrysum*)

BACTERIAL, MLO. **Aster Yellows**, eastern and central states; **California Aster Yellows**, CA.

DOWNY MILDEW. *Plasmopara halstedii*, CA; *Bremia lactucae*, CA.

NEMATODE, Root Knot. *Meloidogyne* sp., FL.

ROT, Stem. *Fusarium* sp., FL.

VIRUS. **Beet Curly Top**, CA, OR, WA; *Bidens* **Mottle**, FL; **Tomato Spotted Wilt**, PA.

WILT. *Verticillium albo-atrum*, CA.

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### Streptanthera

VIRUS. **Iris Mosaic**, CA, OR.

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### Streptocarpus

VIRUS. **Tobacco Mosaic**, CA, CT, DC, FL, OH, WA; **Tomato Spotted Wilt**, PA.

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### Streptopus (Twisted-Stalk)

LEAF SPOT. *Cercospora streptopi*, WA; *Septoria streptopidis*, MT.

RUST. *Puccinia sessilis* (0, I), NY.

SMUT, Leaf. *Tuburcinia clintoniae*, WI.

VIRUS. **Mosaic**, AK.

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### Strophostyles (Wild Bean)

VIRUS. **Alfalfa Mosaic**, AR; **Chlorotic Mottle**, AR; **Cowpea Chlorotic Mottle**, AR; **Quail Pea Mosaic**, AR; **Soybean Mosaic**, AR.

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### Styrax (Snowbell)

LEAF SPOT. *Mycosphaerella punctiformis*, GA.

NEMATODE, Root Knot. *Meloidogyne* sp., MD.

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### Stylosanthes

LEAF SPOT, Canker. *Colletotrichum dematium* f. sp. **truncata**, FL.

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### Sugar Beet (*Beta vulgaris*)

POWDERY MILDEW. *Erysiphe polyoni*, ND.

ROT, Stalk and Blight. *Fusarium solani*, CA, Pacific Coast.

YELLOW. *Fusarium* **Yellows**; *Fusarium oxysporum*, MI; *F. sulphureum*, MN.

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### Sumac (*Rhus*)

CANKER, Stem; DIEBACK. *Botryosphaeria ribis*, "umbrella disease," NY to GA, MN, NE; *Cryptodiaporthe aculeans*, ME to AL, IA, OK; *Nectria cinnabarina*, NY, OK; *N. galligena*, NY, PA, VA; *Phylospora obtusa*, canker, inflorescence blight, NY to AL, KS, MI.

DODDER. *Cuscuta exaltata*, TX.

LEAF BLISTER. *Taphrina purpurascens*, MA to GA, KS, TX.

LEAF SPOT. *Cercospora rhoisa*, general; *Pezizella oenotherae*, NY to GA, WV; *Coniothyrium rhois*, TX; *Harknessia rhoisa*, CA; *Phyllosticta rhoiseda*, CA; *Septoria rhoisa*, general; *Cylindrosporium* sp., CO, NE.

MOLD, Leaf. *Cladosporium aromaticum*, IA, NE, NY, WI, WV.

PARASITIC LICHEN. *Strigula elegans* and *S. complanata*, LA, Southern U.S.

POWDERY MILDEW. *Sphaerotheca macularis*, widespread; *Oidium* sp., WI.

ROT, Root. *Armillaria mellea*, CA; *Clitocybe tabescens*, FL; *Corticium galactinum*,



white root, VA; **Phymatotrichum omnivorum**, TX.  
 ROT, Wood. **Polyporus** spp.; **Poria punctata**, MI; **Schizophyllum commune**, cosmopolitan; **Steccherinum ochraceum**, PA.  
 RUST. **Pileolaria effusa** (0, III), AZ; **P. patzcuarensis** (0, I, II, III), CO, NM, OK.  
 WILT. **Fusarium oxysporum** f. sp. **rhois**, CT, KS, VA; **Verticillium albo-atrum**, IL, IA, MA, MN.

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### Sunflower (*Helianthus*)

ANTHRACNOSE. **Colletotrichum acutatum**, CA.  
 BACTERIAL Leaf Spot. **Pseudomonas syringae** pv. **helianthi**; **P. syringae** pv. **tagetis**, WI.  
 BACTERIAL, MLO. California Aster Yellows, CA.  
 BACTERIAL Stem Rot. **Erwinia carotovora**, ND.  
 BACTERIAL Wilt and Apical Chlorosis. **Pseudomonas solanacearum**, FL; **P. syringae** pv. **tagetis**, KS, MN, ND, WI; **Erwinia carotovora** pv. **carotovora**, IN.  
 BLACK KNOT, Black Patch. **Gibberidea heliopsisidis**, GA, IL, MS, MO, NC, VA.  
 BLIGHT, Gray Mold; Bud Rot. **Botrytis cinerea**, CA, OR.  
 BLIGHT, Petal. **Itersonilia perplexans**, FL.  
 BLIGHT, Seedling. **Alternaria helianthi**, MN; **Diaporthe helianthi**, TX.  
 BLIGHT, Southern, **Sclerotium rolfsii**, LA, TX.  
 CANKER, Stem. **Diaporthe helianthi**, OH, TX; **Phomopsis helianthi**, IL.  
 DODDER. **Cuscuta** sp., OK, TX, WA.  
 DOWNY MILDEW. **Plasmopara halstedii**, NY to MD, KS, MT, TX.  
 GALL, Basal. **Plasmopara halstedii**, MN, ND.  
 LEAF SPOT. **Ascochyta compositarum**, WI; **Cercospora helianthi**, IL, KS, MO, OH, TX, WI; **C. pachypus**, AL, KS, OK, TX; **Colletotrichum helianthi**, WI; **Septoria helianthi**, general; **Alternaria zinniae**; **Alternaria helianthi**, MN, OH.  
 NEMATODE, Leaf Gall. **Tylenchus balsamophilus**, WA.  
 NEMATODE, Root Knot. **Meloidogyne** sp., AL, FL, TX, WV.

POWDERY MILDEW. **Golovinomyces cichoracearum**, general, CA.  
 ROT, Charcoal. **Macrophomina phaseolina**, CA, IL, MD, MN, ND, SD.  
 ROT, Head. **Rhizopus oryzae**, CA, NM; **Phoma macdonaldii**, premature ripening, ND.  
 ROT, Root. **Armillaria mellea**, OR; **Helicobasidium purpureum**, violet root, TX; **Phymatotrichum omnivorum**, TX; **Pythium debaryanum**; **Rhizoctonia solani**, IL, MD, NE, NY, WI.  
 ROT, Stem. **Phytophthora cryptogea**, CA; **Septosphaeria lindquistii**, black stem, MN, ND; **Sclerotinia sclerotiorum**, widespread.  
 RUST. **Puccinia helianthi**, (0, I, II, III), general, CA, IL, MN, NE, ND; **P. massalis**, NM, TX; **P. canaliculata**, GA, KS; **P. xanthii**, ND; **Coleosporium helianthi** (II, III), NY to FL, LA and OK; II, III on pine; **C. madaiae**, CA; **Uromyces junci** (0, I), CA, KS, NE, ND, OK, SD, WY; **U. silphii** (0, I), IL, MO, NY, TN, WI.  
 SMUT, Leaf. **Entyloma polysporum**, CA, MT.  
 VIRUS. Bromegrass Mosaic General, IA, SD; **Sunflower Mosaic**, IN, TX; **Cucumber Mosaic**, FL, MD; **Bidens Mottle**, FL.  
 WHITE RUST. **Albugo tragopogonis**, CO, IL, KS, MO, WI.  
 WILT. **Fusarium oxysporum** f. sp. **apii**, SC; **F. sporotrichioides**, MN; **Verticillium albo-atrum**; **V. dahliae**, CA; **Sclerotinia sclerotiorum** = **Whetzelinia sclerotiorum**, CA.

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### Sunrose (*Helianthemum*)

LEAF SPOT. **Cylindrosporium eminens**, TX, WI; **Septoria chamaecisti**, WA.  
 ROT, Root. **Phymatotrichum omnivorum**, TX.

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### Swedish Ivy (*Plectranthus australis*)

NONPARASITIC. Brown Leaf Spot. Boron deficiency.  
 VIRUS. Alfalfa Mosaic, NY; Tomato Spotted Wilt, PA; and TSW-Impatiens Serotype, GA, FL.

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### Sweet Alyssum (*Lobularia*)

BACTERIAL, MLO. *Aster Yellows*, NJ.  
 CLUB ROOT. *Plasmiodiophora brassicae*, NJ.  
 DAMPING-OFF, Root Rot. *Rhizoctonia solani*, NJ,  
 NY, VA; *Pythium ultimum*, NJ.  
 DODDER. *Cuscuta* sp., TX.  
 DOWNY MILDEW. *Peronospora parasitica*, CA,  
 NJ.  
 NEMATODE, Root Knot. *Meloidogyne* sp.  
 POWDERY MILDEW. *Erysiphe polygoni*, CA.  
 ROT, Crown. *Sclerotinia sclerotiorum*, VA.  
 ROT, Root. *Phoma lingam*, CA.

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### Sweet-Fern (*Comptonia*)

RUST, Blister. *Cronartium comptoniae* (II, III),  
 ME to MN, NC, OH; 0, I on hard pine.  
 RUST, Leaf. *Gymnosporangium ellisii* (0, I), NJ;  
 II, III on *Chamaecyparis*.

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### Sweet-Flag (*Acorus*)

LEAF SPOT. *Cylindrosporium acori*, CT, KS;  
*Ramularia aromatica*, CT to MD, IN, WI;  
*Septocylindrium* sp., NY.  
 RUST. *Uromyces sparganii* (II, III), ME to VA,  
 IL, MN, MS; 0, I unknown.

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### Sweet Gale (*Myrica gale*)

BLIGHT, Twig. *Diplodia* sp., NJ.  
 LEAF SPOT. *Ramularia monilioides*, NY;  
*Septoria myricata*, NY.  
 RUST. *Cronartium comptoniae*, ME to NY,  
 WA; 0, I on pine; *Gymnosporangium ellisii*  
 (0, I), ME.

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### Sweet Gum (*Liquidambar*)

ANTHRACNOSE. *Gloeosporium nervisequum*.  
 BACTERIAL LEAF SCORCH. *Xylella fastidiosa*, KY.

BLIGHT; Leader Dieback. Cause unknown, killing  
 trees in AL, AR, FL, GA, LA, MD, SC, TX.

BLIGHT, Thread. *Pellicularia koleroga*, LA.

CANKER; DIEBACK. *Botryosphaeria ribis* var.  
*chromogena*, IL, NY, MD to FL, LA;  
*B. dothidea*, MS; *Hymenochaete*  
*agglutinans*, MD; *Nectria* sp.; *Dothiorella*  
*berengeriana*, bleeding necrosis, NJ, NY;  
*Xylella fastidiosa*, Southern CA.

CANKER, Felt Fungus. *Septobasidium alni*;  
*S. apiculatum*, *S. burtii*, *S. mariani*, *S.*  
*pseudopedicellatum*, and *S. sinuosum*,  
 southern states.

LEAF SPOT. *Cercospora liquidambaris*, MD to  
 FL, TX; *C. tuberculans*, FL, LA, MS, MO;  
*Discosia artocreas*, OK; *Exosporium*  
*liquidambaris*, TX; *Leptothyrella*  
*liquidambaris*, red leaf spot, IL, MD, NC;  
*Septoria liquidambaris*, MA to FL, TX;  
*Actinopelte dryina*; *Cladosporium* sp., OR.

MISTELTOE. *Phoradendron serotinum*  
 (*flavescens*), OH to NC, TX.

NEMATODE, Root Knot. *Meloidogyne* sp.

NONPARASITIC. **Blight; Decline;** Leader Dieback.  
 Killing trees in AL, AR, FL, GA, LA, MD, SC,  
 TX. Partly moisture shortage.

ROT, Heart. *Polyporus adustus* and *P. gilvus*,  
 widespread.

ROT, Root. *Clitocybe tabescens*, FL;  
*Phymatotrichum omnivorum*, TX;  
*Cylindrocladium scoparium*, GA.

ROT, Wood. *Daedalea confragosa*,  
 cosmopolitan; *Fomes* spp., *Ganoderma*  
 spp.; *Hericium erinaceus*; *Steccherinum*  
*ochraceum*; *S. pulcherrimum*, Gulf states;  
*Polyporus* spp., *Poria* spp.; *Pleurotus* spp.;  
*Schizophyllum commune*, cosmopolitan;  
*Stereum* spp.

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### Sweetleaf (*Symplocos*)

GALL, Bud. *Exobasidium symploci*, Gulf states  
 to NC and IN.

LEAF SPOT. *Septoria stigma*, AL; *S. symploci*,  
 FL, MS, NC, OK, TX.

ROT, Root. *Phymatotrichum omnivorum*, TX.

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**Sweet-Olive (*Osmanthus fragrans*)**

BLACK MILDEW; Black Spot. *Asterina* sp., MS.

LEAF SPOT. *Gloeosporium oleae*, MD.

ROT, Root. *Armillaria mellea*, CA; *Clitocybe tabescens*, LA.

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**Sweet Pea and Perennial Pea (*Lathyrus*)**

ANTHRACNOSE; Blossom and Shoot Blight.

*Glomerella cingulata*, general except on Pacific Coast.

BACTERIAL Crown Gall. *Agrobacterium tumefaciens*, NJ, VA.

BACTERIAL Fasciation. *Clavibacter fascians*, widespread.

BACTERIAL Leaf Spot. *Pseudomonas pisi*, IN, WI.

BLIGHT, Gray Mold. *Botrytis cinerea*, general.

BLIGHT, Southern. *Sclerotium rolfsii*, FL, TX.

DAMPING-OFF; Root and Stem Rot. *Pythium* spp., CA, CT, MD, MA, NJ, NY, NC; *Rhizoctonia solani*, general.

DODDER. *Cuscuta indecora*, TX.

DOWNY MILDEW. *Peronospora trifoliorum*, FL.

LEAF SPOT. *Alternaria* sp., secondary, MD, MA, NJ, NY, PA, TX; *Colletotrichum pisi*, AL, FL, GA, SC; *Ascochyta* sp., also stem spot, CT, LA, MN, MO, WV, WI; *A. lathyri*, NJ; *Cercospora lathyrina*, GA, OK; *Isariopsis griseola*, CT; *Mycosphaerella pinodes*, also stem spot, MN, WI; *Ovularia* sp., CA; *Phyllosticta orobella*, TX; *Ramularia* sp., NY, MA, NJ, PA, TX, WA; *R. deusta* f. sp. *odorati*, CA; *Curvularia* sp., CA.

MOLD, White. *Erostrotheca multiformis* (*Cladosporium album*) CA, MA, NJ, NY, PA, TX, WA, in greenhouses.

NEMATODE, Lesion. *Pratylenchus pratensis*, NJ, NY.

NEMATODE, Root Knot. *Meloidogyne* spp., FL, MA, NJ, NY, TX.

NONPARASITIC. **Bud Drop**. Unbalanced nutrition, low light intensity in greenhouses.

POWDERY MILDEW. *Microsphaera alni*, general, especially in greenhouses; *Erysiphe polygoni*, widely reported, sometimes confused with *M. alni*.

ROT, Root. *Aphanomyces euteiches*, IN, MI, WI; *Fusarium solani* f. sp. *psii*, occasional to prevalent under glass and outdoors; *Phymatotrichum omnivorum*, TX, *Phytophthora cactorum*, CT; *Thielaviopsis basicola*, black rot, CT to OH, CO, FL, IL, MS; Pacific Coast.

ROT; Stem Wilt. *Sclerotinia sclerotiorum*, MD, PA.

VIRUS. **Pea Mosaic; Tomato Spotted Wilt; Sweet Pea Streak**. A complex, components not identified, perhaps in part bacterial.

WILT. *Verticillium* sp., NY, NJ; *Fusarium oxysporum* f. sp. *vasinfectum*, FL, NY.

Control aphids and thrips spreading mosaic and spotted wilt.

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**Sweet Potato (*Ipomoea batatas*)**

BACTERIAL Soft Rot. *Erwinia carotovora*, CT, SC.

BLIGHT, Leaf. *Phyllosticta batatas*, occasional NJ to FL, TX, KS, usually in the South; *Choanephora cucurbitarum*, FL, leaf mold.

BLIGHT, Southern; Cottony Rot. *Sclerotium rolfsii*, general in South.

CANKER, Stem. *Fusarium solani*, NC. LEAF SPOT. *Alternaria* sp., secondary, occasional to general; *Cercospora* sp., FL, OK; *Septoria bataticola*, Occasional NJ to AL, IA, TX.

LEAF SPOT, Blight. *Acremonium crocicinigenum* (= *Cephalosporium cinnamomeum*), CA, FL.

NEMATODE, Lance. *Hoplolaimus coronatus*; Lesion, *Pratylenchus* sp.

NEMATODE, Root Knot. *Meloidogyne incognita* and *M. incognita-acrita*.

NEMATODE, Stem, Bulb. *Ditylenchus dipsaci*, causing brown ring, NJ.

NEMATODE, Sting. *Belonolaimus gracilis*.

NEMATODE, Stunt. *Tylenchorhynchus claytoni*.

NONPARASITIC. **Internal Breakdown.** Perhaps from chilling.

**Internal Brown Spot.** Boron deficiency.

**Intumescence.** High water intake and retarded transpiration.

ROT, Black. **Ceratocystis fimbriata**, general on roots, stems; **Diplodia theobromae** (*Physalospora rhodina*), Java black rot, general in South.

ROT, Charcoal. **Macrophomina phaseoli**, NJ to FL, TX, CA, KS.

ROT, Gray Mold. **Botrytis cinerea**, on sprouts, cosmopolitan.

ROT, Root. **Diaporthe batatis**, dry rot, stem rot, NJ to FL, MO, TX; **Helicobasidium purpureum**, KS, TX; **Pyrenochaeta terrestris**, pink root, CA; **Phymatotrichum omnivorum**, AZ, NM, OK, TX; **Phytophthora** sp., NJ, PA; **Plenodomus destruens**, foot and storage rot, NJ to FL, CA, IA, LA; **Pythium** spp., mottle necrosis, leak, ring rot; **Fusarium solani**, NC; **Geotrichum candidum**, LA, NC.

ROT, Soil; Pox. **Streptomyces ipomoea**, general, NJ to FL, TX, AZ, CA, IA.

ROT, Sprout; Stem Canker. **Rhizoctonia solani**, occasional, NJ to FL, AZ, CA, OH, TX, WA.

ROT, Storage. **Fusarium** spp., general; **Mucor racemosus**, occasional after chilling; **Penicillium** sp., blue mold, cosmopolitan; **Rhizopus** spp., soft rot, general; **Sclerotinia** sp., NC; **Trichoderma** spp., DE, NJ; **Aspergillus** spp., secondary.

RUST. **Coleosporium ipomoeae** (II, III), AL, MS; 0, I on pine.

SCURF. **Monilochaetes infuscans**, general.

SLIME MOLD. **Fuligo violacea**, AL, DE, NJ, TX; **Physarum cinereum**; **P. plumbeum**, AL, AR, KY, MS, NC, VA.

VIRUS. **Sweet Potato Feathery Mottle** (Yellow Dwarf); **Sweet Potato Internal Cork**, GA, LA, MD, MS, NC, SC, TN, VA; **Sweet Potato Mosaic** (Tobacco Mosaic); **Tobacco Ring Spot**; **Beet Curly Top**; **Sweet Potato Russet Crack**; **Sweet Potato Chlorotic Stunt**, NC.

WHITE RUST. **Albugo ipomoeae-panduratae**, general.

WILT. **Fusarium oxysporum** f. sp. **batatas**, stem rot, general; **Verticillium alboatrum**, CA.

Select varieties resistant to *Fusarium* stem rot, in general the Spanish group. Heat treatment eliminates some viruses. Hot water (10 min at 120 °F) controls scurf. Variety Nemagold is resistant to root-knot nematodes.

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### Sweet-Root (*Osmorhiza*)

LEAF GALL. **Urophlyctis** (*Physoderma*) **pluriannulata**, MT.

LEAF SPOT. **Cercospora osmorhizae**, IL, OH, WI; **Fusicladium angelicae**, WA; **Phloeospora osmorhizae**, IA, NY, WI; **Ramularia reticulata**, WI, VA; **Septoria aegopodii**, NY, ND, OH, WI.

RUST. **Puccinia pimpinallae** (0, I, II, III), general.

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### Sweet Vetch (*Hedysarum*)

BLACK MILDEW. **Parodiella perisporioides**, NY.

LEAF SPOT. **Septogloeum hedysari**, WY.

NEMATODE, Root Knot. **Meloidogyne** sp.

RUST. **Uromyces hedysari-obscuri** (0, I, II, III), AK, CO, ID, MT, NM, SD, UT, WY.

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### Sweet William (*Dianthus barbatus*)

ANTHRACNOSE. **Volutella dianthi**, DE, IN, NY.

BACTERIAL, MLO. **California Aster Yellows**, CA.

BLIGHT, Cutting. **Cylindrocladium scoparium** and **C. floridanum**, FL, OH.

BLIGHT, Southern. **Sclerotium rolfsii**, CT, FL, NC.

LEAF SPOT. **Phyllosticta** sp. (*Ascochyta dianthi*), WA; **Septoria dianthi**, AL, IA, MI, NY.

NEMATODE, Leaf and Stem. **Ditylenchus dipsaci**, OR.

NEMATODE, Root Knot. **Meloidogyne** sp., FL, TX.

ROT, Root. **Pythium ultimum**, CA; **Phymatotrichum omnivorum**, TX.

ROT, Stem. **Rhizoctonia solani**, CT, IL, KS, MA, MS, NJ, NY, PA, TX.

RUST. **Uromyces dianthi** (II, III), IA, NE, TX; **Puccinia arenariae** (III), AL, CT, MA, NY, PA.

VIRUS. **Carnation Mosaic; Beet Curly Top**, CA, TX.

WILT. **Fusarium oxysporum** f. sp. **barbati**, CA, KS; **Fusarium** sp., MA, NJ, SC, VA.

Fusarium wilt is one of the more serious diseases with the new growth yellowing, the leaves pointing downward, and plants stunted. Place new plants in a new location or sterilized soil.

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### Swiss Chard (*Beta vulgaris* var. *cicla*)

BACTERIAL Leaf Spot. **Pseudomonas syringae** pv. **aptata**, CA.

BLIGHT, Phytophthora. **Phytophthora capsici**, IL.

BLIGHT, Southern. **Sclerotium rolfsii**, LA, SC.

DAMPING-OFF, Root Rot. **Rhizoctonia solani**, NY; **Pythium aphanidermatum**, CA.

DOWNY MILDEW. **Peronospora schachtii**, CA.

LEAF SPOT. **Cercospora beticola**, general; **Ramularia beticola**, WA.

MOLD, Seed. **Alternaria tenuis**, CA; **Stemphylium botryosum**, CA, WA.

NEMATODE, Root Knot. **Meloidogyne** sp., LA.

NONPARASITIC. **Heart Rot; Cracked Stem**. Boron deficiency, NY, WA.

ROT, Crown. **Sclerotinia** sp., MS.

ROT, Root. **Phymatotrichum omnivorum**, TX.

RUST. **Uromyces betae** (II), CA, OR.

VIRUS. **Beet Curly Top**, AZ, CA, OR; **Beet Mosaic**, AZ, CA, WA; **Yellow Net**, unidentified, CA.

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### Swine Cress (*Coronopus*)

ROT. **Sclerotinia minor**. NC.

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### Switchgrass (*Panicum*)

ANTHRACNOSE. **Colletotrichum graminicola**, TN; **C. navitas**, NY.

BLOTCH, Spot. **Helminthosporium sativum** (**Bipolaris sorokiniana**), PA, TN.

BUNT. **Tilletia pulcherrima**, TX.

DOLLAR SPOT. **Sclerotinia homoeocarpa**, TN.

FOLIAR AND SEED INFECTION. **Alternaria**, **Bipolaris**, **Curvularia** and **Fusarium** spp., TN.

LEAF SPOT. **Bipolaris sacchari**, FL; **B. oryzae**, MS, NY, ND; **Rhizoctonia zeae** (also sheath spot), RI; **Bipolaris spicifera**, TN.

ROT, Root. **Pythium arrhenomanes**, LA; **Bipolaris sorokiniana**, TN.

RUST. **Puccinia emaculata**, AR, TN.

SMUT. **Tilletia maclaganii**, IA, NY, PA.

VIRUS. **Barley Yellow Dwarf**.; **Maize Rayado Fino**, IL.

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### Sycamore

► Plane Tree.

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### Syngonium

ANTHRACNOSE. **Gloeosporium** sp., WA; **Colletotrichum** sp., WA.

BACTERIAL Blight. **Xanthomonas campestris**, MD.

BACTERIAL Leaf Spot. **Xanthomonas dieffenbachiae**, FL; **X. vitians**, FL.

LEAF SPOT. **Cephalosporium cinnamomeum**, NY.

ROT; Black Cane. **Ceratocystis fimbriata**, CA.

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### Synthyris

LEAF SPOT. **Ramularia** sp., OR.

RUST. **Puccinia acrophila** (III), MT to CO, UT; **P. welfeniae** (III), CA, ID, OR, WA, WY.

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### Tabebuia (Trumpet-Tree)

RUST. **Prosopidium plagiopus** (II, III), FL.

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**Tabernaemontana (Crape-Jasmine)**

LEAF SPOT. *Gloeosporium tabernaemontanae*, FL.

LEAF SPOT, Algal; Green Scurf. *Cephaleuros virescens*, FL.

LEAF MOLD. *Cladosporium* sp., FL.

ROT, Mushroom Root. *Clitocybe tabescens*, FL.

RUST. *Uredo manilensis*, FL.

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**Taenidia**

LEAF SPOT. *Fusicladium angelicae*, WI; *Septoria pimpinellae*, MN.

RUST. *Puccinia angelicae* (0, I, II, III), IN, MI, MO, NY, WI.

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**Tahitian Bridal Veil (*Gibasis*)**

VIRUS. **Bean Yellow Mosaic**, VA.

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**Tamarind (*Tamarindus*)**

NEMATODE, Root Knot. *Meloidogyne* sp., FL.

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**Tamarisk, Salt Cedar (*Tamarix*)**

BACTERIAL Blight. Fatal to some plants in AZ, NM, TX, where the host has become a noxious weed.

POWDERY MILDEW. *Sphaerotheca macularis*, IN.

ROT, Root. *Phymatotrichum omnivorum*, CA, TX.

ROT, Wood. *Polyporus sulphureus*, MD.

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**Tansy (*Tanacetum*)**

LEAF SPOT. *Ramularia tanacetii*, WI.

NEMATODE, Root Knot. *Meloidogyne* sp., FL.

POWDERY MILDEW. *Golovinomyces cichoracearum*, PA.

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RUST. *Puccinia tanacetii* (0, I, II, III), WY; 0, I, II, III on *Artemisia*; II on chrysanthemum.

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**Tea (*Thea sinensis*)**

BLIGHT, Twig. *Pestalotia guepini*, also leaf spot, SC.

LEAF SPOT, Algal; Green Scurf. *Cephaleuros virescens*, FL, SC.

SPOT ANTHRACNOSE; Scab. *Sphaceloma* sp., LA; *Elsinoë leucospila*, FL.

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**Teasel (*Dipsacus*)**

BLIGHT, Southern. *Sclerotium rolfsii*, TX.

DOWNY MILDEW. *Peronospora dipsaci*, MO.

LEAF SPOT. *Cercospora elongata*, MD, NY to MO, WA.

NEMATODE, Leaf and Stem. *Ditylenchus dipsaci*, CA, OR.

POWDERY MILDEW. *Phyllactinia corylea*, WA; *Sphaerotheca dipsacearum*, WA.

ROT, Root. *Phymatotrichum omnivorum*, TX.

ROT, Stem. *Sclerotinia sclerotiorum*, TX.

VIRUS. **Teasel Mosaic**.

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**Tellima**

POWDERY MILDEW. *Sphaerotheca macularis*, AK.

RUST. *Puccinia heucherae* (III), AK, CA, OR, WA.

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**Ternstroemia**

SPOT ANTHRACNOSE. *Elsinoë leucospila*, FL.

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**Texasweed (*Caperonia*)**

CANKER, Stem. *Amphobotrys ricini*, TX.

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**Thalia**LEAF SPOT. *Cercospora thaliae*, LA.RUST. *Puccinia thaliae* (II, III), FL.

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**Thermopsis (Bush-Pea, Golden-Pea)**LEAF SPOT. *Cercospora thermopsisidis*, CO, MT;**Phoma thermopsidicola**, CA; **Ramularia sphaerpioides**, WA; **Stigmina thermopsisidis**, CA.POWDERY MILDEW. **Erysiphe polygoni**, Rocky Mts., and Pacific Northwest.VIRUS. **Bean Yellow Mosaic** in false lupine (*Thermopsis caroliniana*), MN.

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**Thistle (*Cirsium*)**LEAF SPOT. *Cercospora* spp., WA, KS, TX; **Phyllosticta cirsii**, NY, WA, WI; **Stagonospora cirsii**, WI; **Septoria cirsii**, VT to IN, TX, WI; **Alternaria chrysanthemi**, MT.POWDERY MILDEW. **Golovinomyces cichoracearum**, general; **Phyllactinia corylea**, WA; **Sphaerotheca macularis**, MD.ROT, Root. **Rhizoctonia solani**, IL; **Phymatotrichum omnivorum**, TX.RUST. **Puccinia cirsii** (0, I, II, III), PA to NC, CA, OR, TX; **P. punctiformis** (0, I, II, III), ME to NJ, CA, OH, WA; **Uromyces junci** (0, I), MO, NE, ND.SMUT, Inflorescence. **Thecaphora trailii**, CO, UT.WHITE RUST. **Albugo tragopogonis**, NY to IA, LA, TX, WY.

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**Thistle, Blessed (*Cnicus*)**BLIGHT, Southern. **Sclerotium rolfsii**, GA.

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**Thistle, Creeping ("Canada") (*Cirsium arvense*)**POWDERY MILDEW. **Golovinomyces cichoracearum**, ID, OR.

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**Thistle, Ivory and Milk (*Silybum*)**RUST. *Puccinia punctiformis*, MD.SMUT, Biological Control. **Microbotryum silybum**, MD.

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**Thistle Musk (*Carduus thoermeri*)**RUST. *Puccinia carduorum*, CA, MO, NV, OK, VA.

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**Thlaspi**LEAF SPOT. *Alternaria brassicicola*, NY.

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**Thoroughwax (*Bupleurum*)**NEMATODE, Root Knot. **Meloidogyne** sp., CA.

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**Thujopsis (*Hiba Arborvitae*)**BLIGHT, Twig. **Phomopsis occulta**, CA.

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**Thunbergia (Clockvine)**BACTERIAL Crown Gall. **Agrobacterium tumefaciens**, CT, FL.BACTERIAL, MLO. **Aster Yellows**, NY.

NEMATODE, Root Knot. *Meloidogyne* sp., FL.  
 VIRUS. Broad Bean Wilt, NY.

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### Thyme (*Thymus*)

BLIGHT, Gray Mold. *Botrytis cinerea*, AK.  
 LEAF SPOT. *Corynespora cassicola*, FL.  
 ROT, Root. *Rhizoctonia solani*, MA.

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### Ti (*Cordyline terminalis*)

LEAF SPOT. *Phytophthora parasitica*, HI.

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### Tibouchina (Glory-Bush)

ROT, Mushroom Root. *Clitocybe tabescens*, FL.

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### Tidestromia

ROT. *Macrophomina phaseolina*, AZ.

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### Tigridia (Tiger-Flower)

BACTERIAL Scab. *Pseudomonas marginata*, MD.  
 NEMATODE, Bulb. *Ditylenchus dipsaci*.  
 ROT, Internal. *Fusarium oxysporum* f. sp.  
*gladioli*; storage, *Penicillium gladioli*.  
 VIRUS. *Tigridia Mosaic*, OR, WA.

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### Tithonia

VIRUS. Tomato Spotted Wilt-Lettuce Serotype,  
 GA.

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### Tomatillo (*Physalis*)

SMUT, Leaf. *Entyloma austral*.  
 VIRUS. Tomato Yellow Leaf Curl, Guatemala,  
 Sinaloa, Mexico; Tomato Spotted Wilt, CA,  
 Mexico.

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### Tomato (*Lycopersicon*)

ANTHRACNOSE. *Glomerella phomoides*  
 (*Colletotrichum coccodes*), chiefly ripe rot of  
 fruit, sometimes on leaves, general, especially  
 in Northeast; *Colletotrichum dematium* var.  
*truncata*, MS; *C. graminicola*, MS; *C.*  
*trichellum*, MS; *C. glycines*, MS; *C. gossypii*,  
 MS.

BACTERIAL Blight. *Pseudomonas viridiflava*, FL;  
*P. huttiensis*, FL.

BACTERIAL Canker. *Clavibacter michiganense*,  
 birds-eye spot, general, most frequent in  
 North and West, Baja, Mexico.

BACTERIAL Crown Gall. *Agrobacterium*  
*tumefaciens*; in experiments, *A. rhizogenes*,  
 hairy root.

BACTERIAL, MLO. Aster Yellows; Tomato Big  
 Bud, NY.

BACTERIAL, Pith Rot. *Erwinia chrysanthemi*,  
 MA; *Pseudomonas corrugata*, CA, FL, LA,  
 MA; also Stem necrosis, FL, Mexico.

BACTERIAL, Seedling Blight. *Bacillus polymyxa*,  
 NY.

BACTERIAL Soft Rot. *Erwinia aroideae* and  
*E. carotovora*, cosmopolitan.

BACTERIAL Speck. *Pseudomonas syringae* pv.  
*tomato*, occasional East and central states,  
 also CA, OK, TX, VA; *P. syringae* pv.  
*tomato* race 1, CA.

BACTERIAL Spot. *Xanthomonas vesicatoria*, on  
 fruit, leaves, sometimes stem cankers, north-  
 eastern, central, and southern states;  
*X. campestris* pv. *vitiensis*, OH; *X. gardneri*,  
 MI, OH, PA.

BACTERIAL Stem Rot. *Erwinia chrysanthemi*,  
 FL.

BACTERIAL Wildfire. *Pseudomonas syringae* pv.  
*tabaci*, WI.

BACTERIAL Wilt. *Pseudomonas solanacearum*,  
 general, MA to IL and southward.

BLIGHT, Aerial. *Pythium myriotylum*, FL.

BLIGHT, Blossom. *Sclerotinia* sp., CA, FL, NY,  
 OH.

BLIGHT, Early; Collar Rot; Fruit Rot. *Alternaria*  
*solani*, general.



- BLIGHT, Foliar. **Rhizoctonia solani**, NC.
- BLIGHT, Gray Mold/Stem Canker. **Botrytis cinerea**, CA, Mexico.
- BLIGHT, Late; Fruit Rot. **Phytophthora infestans**, general in humid regions and seasons, especially East and Southeast, AK.
- BLIGHT, Southern. **Sclerotium rolfsii**, VA to FL and TX, CA, occasional in North.
- BROOMRAPE. **Orobanche ludoviciana**, WY; **O. racemosa**, CA, NJ, NY.
- CANKER, Stem. **Helminthosporium** sp., TX; **Myrothecium roridum**, also fruit rot, OH, TX, VA, WI.
- DAMPING-OFF. **Rhizoctonia solani**, also collar rot, stem canker, cosmopolitan; **Pythium** spp., cosmopolitan.
- DODDER. **Cuscuta** spp., CA, ID, MD, NY, TX.
- DOWNY MILDEW. **Peronospora tabacina**, GA, NC, SC.
- FRUIT SPOT. **Pullularia pullulans**, WV.
- LEAF SPOT. **Ascochyta lycopersici**, DE, FL, NJ, NC, OR, VA, WI; **Septoria lycopersici**, general except Northwest; **Phyllosticta hortorum**, NY; **Cercospora** spp.; **Stemphylium solani**, gray leaf spot, FL, GA, IN, LA, NJ, NC, SC, TN, TX, VA; **S. floridanum**; **Cladosporium oxysporum**, NY; **Cristulariella moricola**, NY.
- LEAF SPOT, Target, fruit necrotic pit, freckles. **Corynespora cassiicola**, FL.
- MOLD, Blue. **Penicillium oxalicum**, Mexico.
- MOLD, Leaf. **Botryosporium pulchrum**, PA, TX; **Chaetomium bostrychodes**, TX; **Cladosporium fulvum**, general under glass, occasional outdoors, IA.
- NEMATODE, Awl. **Dolichodorus heterocephalus**.
- NEMATODE, Dagger. **Xiphinema americanum**.
- NEMATODE, Golden. **Heterodera rostochiensis** (*Globodera rostochiensis*); tobacco cyst, **H. tabacum**; soybean cyst, **H. glycines**, IA, MN, OH.
- NEMATODE, Lance. **Hoplolaimus coronatus**.
- NEMATODE, Lesion. **Pratylenchus pratensis**, MD, NJ.
- NEMATODE, Reniform. **Rotylenchulus reniformis**.
- NEMATODE, Root Knot. **Meloidogyne arenaria** var. **thamesi**; **M. hapla**, Pacific Northwest; **M. incognita**; **M. javanica**; **M. chitwoodi**, Pacific Northwest; **M. floridensis**, FL.
- NEMATODE, Spiral. **Helicotylenchus nannus**.
- NONPARASITIC. **Blossom-End Rot**. Unbalanced moisture and calcium deficiency, general.
- Blotchy Ripening**. Malnutrition, potassium deficiency.
- Catface**. Fruit abnormalities from growth disturbances.
- Cloudy Spot**. Feeding punctures of plant bugs.
- Cuticle Crack**. Of green fruit; high soil moisture and air temperature.
- Fasciation**. Genetic abnormality. Unbalanced nutrition.
- Leafroll**. Excessive soil moisture with starch congestion in leaves.
- Oedema**. Leaf hypertrophy from excessive water absorption and reduced transpiration.
- Pockets**; **Puffing**. Fruit defect from factors adversely affecting pollination and growth.
- Psyllid Yellows**. Toxemia from psyllid feeding, western states; **Candidatus Liberibacter psyllaourous**, AZ, CO.
- Russetting**. Mite injury.
- Sunscald**. Fruit injury in heat on plants defoliated by disease.
- Walnut Wilt**. Toxemia from root excretions of walnut trees.
- PHYTOPLASMA, Citrus Huanglongbing. **Candidatus Liberibacter asiaticus**, FL.
- PHYTOPLASMA, Leaf Cup Stunt. **Candidatus Liberibacter solanacearum**, New Zealand.
- PHYTOPLASMA, Little Leaf. **Phytoplasma asteris**, Mexico.
- PHYTOPLASMA, Yellowing Disease. **Candidatus Liberibacter solanacearum**, TX, Central America, Mexico, Baja, CA.
- POWDERY MILDEW. **Erysiphe polygoni**, on seedlings indoors, NC; **Erysiphe** sp., CT, FL, NJ, NY, Canada; **Leveillula taurica**, AZ, CA, UT; **Oidiopsis taurica**, CA; **Oidium** sp., CA; **O. neolycopersici**, FL, MI, Mexico.
- ROT, Black Root. **Thielaviopsis basicola**, CA.
- ROT, Brown, Root. **Pyrenochaeta lycopersici**, MA.
- ROT, Buckeye; Stem Rot. **Phytophthora parasitica**, MA to FL, AZ, CA, IL, TX;

- P. cactorum**, NY, PA, WI; **P. capsici** United States, Mexico; **P. cryptogea**; **P. drechsleri**; **P. nicotianae**, NM.
- ROT, Charcoal. **Macrophomina phaseoli**, CA, TX.
- ROT, Fruit. **Alternaria** sp., black mold; **Aspergillus** spp., green and yellow mold; **Alternaria alternata**, NY; **Brachysporium tomato**, KS, TX; **Cladosporium herbarum**, green mold; **Diaporthe phaseolorum**, MS, TX; **Diplodia theobromae**, AL; **Glomerella cingulata**, FL, LA, ME, MI, NJ, NY; **Isaria clonostachoides**, VA; **Mucor mucedo**, MD; **Nematospora coryli**, cloudy spot, CA, FL, GA; **Nigrospora oryzae**, CA; **Oospora lactis**, sour rot, cosmopolitan; **Phoma destructiva**, black spot, nearly general; **Pleospora lycopersici**, CA; **Rhizopus stolonifer**, cosmopolitan in transit; **Sclerotinia minor**, TX; **Sporotrichum** sp., IN, TX; **Trichothecium roseum**, MD, NC, OH, Brazil; **Gibberella zeae**; **Phoma** sp.; **Myrothecium** sp.; **Eremothecium coryli**, CA.
- ROT, Gray Mold; Ghost Spot. **Botrytis cinerea**, occasional on foliage, fruit, stems.
- ROT, Nailhead Spot. **Alternaria tomato**, on fruit, stems, CT to FL, ND, TX.
- ROT, Root. **Aphanomyces cladogamus**; **Colletotrichum atramentarium**, black dot; **Pyrenochaeta terrestris**, secondary, IA, IL, NJ; **Phymatotrichum omnivorum**, AZ, OK, TX; **Plectospora myriandra**, VA; **Thielaviopsis basicola**, TX; **Fusarium oxysporum**, FL, NE, NH, OH, (different from wilt); **F. oxysporum** f. sp. **radicis**, crown, FL, NH, OH, PA, TX. Also **F. oxysporum** f. sp. **radicis-lycopersici**, TX; **F. solani** f. sp. **eumartii**, CA.
- ROT, Root (and stunting of seedlings). **Pythium myriotylum** and **P. arrhenomanes**, FL.
- ROT, Root and Wilt. **Colletotrichum coccodes**, CA.
- ROT, Stem, Fruit. **Sclerotinia sclerotiorum**, occasional in greenhouses and in South; **Pythium myriotylum**.
- SCAB, Powdery. **Spongospora subterranea**, PA.
- VIROID. **Mexican Papita**. British Columbia, Canada; **Tomato Chlorotic Dwarf**, AZ, Mexico; **Potato Spindle Tuber**, CA, MD.
- VIRUS. **Tobacco Mosaic**, general, strains causing fernleaf and internal browning of fruit; **Cucumber Mosaic**, also causing shoestring; **Beet Curly Top**; **Western Yellow Blight**; **Tomato Aspermy**, AZ; **Tomato Ring Mosaic**; **Tomato Ring Spot**, FL (South); **Tomato Spotted Wilt**, CA, OK, TN, Mexico; **Tomato Streak** (Tobacco Mosaic plus Potato Virus X); **Tomato Yellow Net**; **Tomato Yellow Top**; **Witches' Broom**; **Tobacco Etch**, may cause severe mosaic; **Rugose Mosaic** (due to Potato Mottle Virus and Potato Virus Y); **Pseudo Curly Top**, FL; **Tobacco Streak**, CA; **Tomato Mosaic**, CA; **Tomato Mottle**, FL, SC, TN, VA; **Tomato Infectious Chlorosis**, CA, GA, Costa Rica; **Tomato Bushy Stunt**, CA; **Tomato Black Ring**; **Tomato Pseudo Curly Top**, FL; **Tomato Top Necrosis**, IL, IN, MO; **Tomato Yellow Leaf Curl** CA, FL, GA, HI, KY, LA, MS, NC, SC, TX, Guatemala, Sinaloa, Mexico; **Serrano Golden Mosaic**, AZ; **Potato Leafroll**, Pacific Northwest; **Pepper Golden Mosaic**, CA, Mexico; **Pepino Mosaic**, AZ, CO, TX, Ontario Canada, Mexico; **Tomato Chino La Paz**, Baja CA, Mexico; **Tomato Severe Leaf Curl**, Mexico; **Chocolate Spot** (**Tomato Torrado Virus**), Guatemala, Panama; **Necrosis Disease**, CA; **Candidatus Liberibacter solanacearum**, NM, Mexico; **Pelargonium Zonate Spot**, CA; **Tomato Golden Mottle**, Mexico; **Tomato Apex Necrosis**, Mexico.
- WART. **Synchytrium endobioticum**, PA (see under ► [Galls](#)).
- WILT. **Fusarium oxysporum** f. sp. **lycopersici**, general, Mexico, Race 3, FL, TN; **Verticillium alboatrum**, occasional in all regions.
- Choose tomato varieties resistant to *Fusarium* wilt; purchase seed certified free from virus disease. In setting seedlings discard any showing galls of root-knot nematodes. Do not smoke while handling, and do not use tobacco stems as a mulch, although other mulches are helpful. Spray for late blight and other foliage diseases. State and federal

agencies give warning when late blight is imminent and it is time to start spraying. See ►USDA Agricultural Handbook 203 for an excellent discussion of tomato diseases with fine illustrations.

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## Torenia

NEMATODE, Root Knot. **Meloidogyne** sp., MD.  
POWDERY MILDEW. **Oidium** sp., LA.

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## Torreya

LEAF SPOT. **Phomopsis** sp; **Diaporthe**,  
**Lasiodiplodia**, **Hypoxyton**, **Fuarium** spp.  
**Botryosphaeria obtusa**, FL, GA.  
NEEDLE SPOT. **Fusarium lateritium**, FL.  
NEEDLE SPOT, CANKER STEM. **Pestalotiopsis**  
**microspora**, FL.

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## Tradescantia (Wandering Jew, Spiderwort)

BLIGHT, Gray Mold. **Botrytis cinerea**, AK.  
LEAF SPOT. **Cladochytrium replicatum**, NY,  
secondary; **Colletotrichum** sp., NJ, TX;  
**Cylindrosporium tradescantiae**, IA;  
**Septoria tradescantiae**, WI to TX, SD.  
NEMATODE, Root Knot. **Meloidogyne** sp.,  
OR, TX.  
RUST. **Uromyces commelinae** (II, III), TX.  
VIRUS. **Tomato Spotted Wilt**, PA; **Tradescantia**  
**zebrina**, MN.

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## Trautvetteria (False Bugbane)

DOWNY MILDEW. **Peronospora ficariae**, TN.  
LEAF SPOT. **Septoria trautvetteriae**, WV.  
RUST. **Puccinia pulsatillae**, ID, OR, WA.  
SMUT, Leaf and Stem. **Urocystis anemones**, UT.

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## Tree-Poppy (*Dendromecon*)

SMUT, Leaf. **Entyloma eschscholtziae**, CA.

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## Tree-Tomato (*Cyphomandra*)

BACTERIAL CANKER. **Clavibacter michiganense**,  
CA.  
POWDERY MILDEW. **Oidium** sp., MD.

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## Trefoil, Birdsfoot (*Lotus*)

DECAY; Rot. Root, Stem. **Mycoleptodiscus**  
**terrestris**, DE, WI.  
LEAF SPOT. **Cercospora zebrina** (clover isolate),  
NC.  
RUST. **Uromyces** sp., PA, rust pustules were col-  
onized by **Sphaerellopsis filum**.

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## Trillium (Wake-Robin)

BLIGHT, Leaf. **Ciborinia trillii**.  
BLIGHT, Tuber Storage Rot. **Sclerotinia**  
**sclerotiorum**, LA.  
LEAF SPOT. **Colletotrichum peckii**, NY to  
NC, IL, MN; **Gloeosporium trillii**, CA,  
OR, WA; **Heterosporium trillii**, WA;  
**Phyllosticta trillii**, NY, PA, WA, WI;  
**Septoria trillii**, New England to OK, SC, WI.  
ROT, Stem. **Sclerotium rolfsii**, NH, PA.  
RUST. **Uromyces halstedii** (0, I), IL, NY; II, III on  
*Spartina*.  
SMUT, Leaf. **Urocystis trillii**, ID, OR.

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## Tritonia (*Montbretia*)

BLIGHT, Leaf. **Alternaria** sp., secondary, NH;  
**Heterosporium** sp., OR, WA.

BLIGHT, Southern. *Sclerotium rolfsii*, CA.  
 ROT, Corm. *Fusarium oxysporum* f. sp. *gladioli*,  
 yellows; *Stromatinia gladioli*, in commercial  
 stocks.

VIRUS. *Iris Mosaic*, CA, OR.

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### **Trollius (*Globeflower*)**

LEAF SPOT. *Ascochyta* sp., NY;  
*Cylindrosporium montenegrinum*, WY;  
*Phyllosticta trollii*, WY.  
 SMUT, Leaf and Stem. *Urocystis anemones*, MD,  
 NY.

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### **Tropical Soda Apple (*Solanum viarum*)**

NEMATODE, Root Knot. *Meloidogyne arenaria*,  
 FL.

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### **Trumpetvine, Trumpet-Creeper (*Campsis*)**

LEAF SPOT. *Cercospora duplicata*, LA;  
*Mycosphaerella tecomae* (*Cercospora*  
*sordida*), general; *Phyllosticta tecomae*,  
 MS; *Myrothecium roridum*, TX; *Septoria*  
*tecomae*, OK, TX, WV.

MISTLETOE. *Phoradendron serotinum*  
 (*flavescens*), TX.

POWDERY MILDEW. *Golovinomyces*  
*cichoracearum*, IL; *Microsphaera alni*,  
 MD to AL, IN, TX.

ROT, Root. *Phymatotrichum omnivorum*, TX.

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### **Tuberose (*Polianthes*)**

BACTERIAL Soft Rot. *Erwinia carotovora*, NC.

BLIGHT, Leaf and Flower Spot. *Botrytis elliptica*,  
 CA.

LEAF SPOT. *Cercospora* sp., TX;  
*Helminthosporium* sp., also stem spot, TX.

NEMATODE, Root Knot. *Meloidogyne* sp., CA,  
 FL, NC, TX, VA.

ROT, Root. *Pythium debaryanum*, TX; *Rhizoc-*  
*tonia solani*, NC.

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### **Tulip (*Tulipa*)**

ANTHRACNOSE. *Gloeosporium thuemennii* f. sp.  
*tulipi*, CA.

BACTERIAL Soft Rot. *Erwinia carotovora*, WA.

BLIGHT, Botrytis; Tulip Fire. *Botrytis tulipae*,  
 general except for South and Southwest;  
**B. cinerea**, sometimes secondary.

BLIGHT, Southern; Bulb and Stem Rot. *Sclero-*  
*tium rolfsii*, CA, CT, NY, OR.

NEMATODE, Bulb. *Ditylenchus dipsaci*, NY.

NONPARASITIC. **Chalking**, stone disease. Immatu-  
 rity of bulbs or injury at digging.

**Topple**, Sugarstem. Collapse of flower stem,  
 often from calcium deficiency.

ROT, Basal. *Fusarium* sp., OK, WA.

ROT, Black. *Sclerotinia sclerotiorum*, WA.

ROT, Bulb. *Penicillium* spp., blue mold; *Asper-*  
*gillus* spp., black mold, cosmopolitan; **Rhizo-**  
**pus stolonifer**, mushy rot, cosmopolitan;  
*Sclerotinia* sp., ME, OH, WA; *S. sativa*,  
 MD, NY; *Pythium ultimum*, secondary.

ROT, Gray Bulb. *Rhizoctonia tuliparum*, North-  
 east, Pacific states.

ROT, Root, Stem, Bulb. *Rhizoctonia solani*, MA,  
 NY, WA.

ROT, Stem; Flower Spot. *Phytophthora*  
*cactorum*, CA, IA, NJ, PA, SC, WA.

VIRUS. **Tulip Breaking** (Lily Latent Mosaic and  
 Tulip Color-adding), general; **Tobacco**  
**Necrosis**, WI.

Botrytis blight is extensive with tulips. In  
 a wet spring, leaves are blasted, buds blighted,  
 and open flowers covered with spots, followed  
 by the familiar gray mold. Sanitary measures  
 are all-important, for the sclerotia survive in  
 the soil, ready to blight new, healthy bulbs.  
 Cut off fading flowers into a paper bag. Gradual  
 running out of tulips may be due to virus dis-  
 ease. Breaking of flowers, once considered  
 a desirable ornamental character, is now recog-  
 nized as a disease that may be harmful in the

long run. Unless aphids are controlled, the virus will spread from variegated to solid-color plantings in the garden.

sometimes turn yellow and drop prematurely. Leaf spots are seldom serious enough for treatment.

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### Tulip-Tree, Yellow Poplar (*Liriodendron*)

BACTERIAL Root Lesion. *Pseudomonas* sp., OR.

BLIGHT, Seedling. *Rhizoctonia solani*, OH, VA.

CANKER. *Dothiorella* sp., PA; *Myxosporium* spp., NY; *Nectria* sp., WV to NC, TN; *Fusarium solani*, SC.

LEAF SPOT. *Cylindrosporium cercosporioides*, MD, WV; *Gloeosporium liriodendri*, CT to NJ, TX; *Mycosphaerella liriodendri*, GA, MI; *M. tulipiferae*, Middle Atlantic and Gulf states; *Phyllosticta liriodendrica* (conidial stage of *Mycosphaerella*), widespread; *Ramularia liriodendri*, AL, DE.

LEAF SPOT, Tar, Black. *Ectostroma liriodendri*, widespread; *Rhytisma liriodendri*, CA, TX, VA.

NEMATODE, Lesion. *Pratylenchus pratensis*, TX.

POWDERY MILDEW. *Phyllactinia corylea*, NY to AL, MO; *Erysiphe polygoni*, widespread.

ROT, Heart. *Collybia velutipes*, WV; *Ganoderma applanatum*, occasional.

ROT, Root. *Armillaria mellea*, VA; *Phymatotrichum omnivorum*, TX; *Cylindrocladium liriodendri*, CA.

ROT, Sapwood; Wood. *Daedalea extensa* and *D. unicolor*, sometimes on standing trees; *Daldinia vernicosa*, cosmopolitan; *Polyporus* spp.; *Schizophyllum commune*, wound rot; also many stain and timber rots.

ROT, Seedling Collar. *Cylindrocladium scoparium*, NJ, NC, TN.

SOOTY MOLD. *Capnodium elongatum*, cosmopolitan.

VIRUS. **Chlorotic Ringspot and Vein Banding**, NC, SC.

The most conspicuous fungus on ornamental tulip-trees is the black sooty mold growing in copious honeydew secreted by tulip-tree aphids and scales. In hot, dry weather leaves

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### Tung Tree (*Aleurites*)

ANTHRACNOSE. *Glomerella cingulata*, FL.

BLIGHT, Southern. *Sclerotium rolfsii*, TX.

BLIGHT, Thread. *Pellicularia koleroga*, FL, LA, MS, TX; Web, *P. filamentosa*, LA, MS.

CANKER; DIEBACK; Nut Rot. *Botryosphaeria ribis*, GA, LA; *Physalospora rhodina*, FL, LA, MS, TX.

CANKER, Felt Fungus. *Septobasidium pseudopedicellatum*, LA.

LEAF SPOT. *Cercospora websteri*, MS; *Gloeosporium aleuriticum*, MS; *Phyllosticta* sp., FL, GA, *Cristulariella pyramidalis*, FL.

LEAF SPOT, Angular. *Mycosphaerella (Cercospora) aleuritidis*, MS.

NEMATODE, Root Knot. *Meloidogyne* sp., AL, FL, MS.

NONPARASITIC. **Chlorosis**. Copper or potassium deficiency, FL.

**Frenching**. Manganese deficiency, FL.

**Bronzing**. Zinc deficiency, FL.

**Wetwood**. Alcoholic slime flux. Perhaps bacterial in part.

**White Seed**. Genetic abnormality.

ROT, Root, Collar. *Clitocybe tabescens*, serious throughout tung belt; *Cephalosporium* sp., LA; secondary; *Phytophthora cinnamomi*, LA.

ROT, Root; Collar Rot. *Cylindrocladium scoparium*, *C. crotalariae*, *C. floridanum*, MS.

Spraying is usually necessary for thread blight and nut rot.

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### Tupelo, Sour Gum, Black Gum (*Nyssa*)

ANTHRACNOSE. *Colletotrichum acutatum*, GA.

BLIGHT, Thread. *Pellicularia koleroga*, LA.

CANKER. *Nectria galligena*, CT; *Strumella coryneoidea*, northern Appalachians; *Botryosphaeria ribis*, IL; *Fusarium solani*, LA.

CANKER, Felt Fungus. *Septobasidium* spp., NJ to Gulf states.

LEAF SPOT. *Actinopelte dryina*, AL, IL, OK; *Cercospora nyssae*, TX; *Mycosphaerella nyssaeicola*, MA to GA, MI; *Phyllosticta nyssae*, southeastern states to TX.

MISTLETOE. *Phoradendron serotinum* (*flavescens*), FL, IN, MD, TX.

ROT, Heart. *Ganoderma applanatum*; *Fomes connatus*, CT; *Hericium erinaceus*, NC.

ROT, Root. *Phymatotrichum omnivorum*, TX.

ROT, Wood. *Daedalea confragosa*; *D. unicolor*, occasional; *Lentinus* spp., cosmopolitan; *Polyporus* spp.; *Stereum* spp.; *Trametes rigida*, Gulf states.

RUST. *Aplopsora nyssae* (II, III), MD to AL, TX.

WILT, Seedling. *Phytophthora cactorum*, MO.

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## Tupidanthus

LEAF SPOT. *Alternaria panax*, CA.

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## Turnip (*Brassica rapa*)

ANTHRACNOSE. *Colletotrichum higginsianum*, NY to FL, TX.

BACTERIAL Black Rot. *Xanthomonas campestris*, ME to FL, MN, TX.

BACTERIAL Blight. *Pseudomonas syringae* pv. *alisalensis*, CA.

BACTERIAL Crown Gall. *Agrobacterium tumefaciens*, KS.

BACTERIAL Leaf Spot. *Pseudomonas syringae* pv. *maculicola*, OH; *Xanthomonas campestris* pv. *campestris*, SC.

BACTERIAL Soft Rot. *Erwinia carotovora*, general in field, transit, storage.

BACTERIAL Spot. *Pseudomonas maculicola*, CT, GA, MA, TX; *Xanthomonas vesicatoria* pv. *raphani*, IN.

BLACKLEG. *Phoma lingam*, CT, MA, WA.

BLIGHT, Southern. *Sclerotium rolfsii*, FL, TX.

CLUB ROOT. *Plasmodiophora brassicicola*, ME to NC, CA, CO, MN, TX, WA.

DAMPING-OFF. *Pythium ultimum*, WI; *Rhizoctonia solani*, also root, stem and storage rot, general.

DOWNY MILDEW. *Peronospora parasitica*, MA to FL, IL, TX.

LEAF SPOT. *Alternaria brassicae*, gray leaf spot, general; *A. oleracea*, black leaf spot, CT, FL, MD, MA, NJ, NC, TX; *Alternaria raphani*, AZ; *Cercospora brassicicola*, AL, FL, GA, MS; *Mycosphaerella brassicicola*, ring spot, OR; *Phyllosticta* sp., TX, WV; *Ramularia* sp., AL, FL, WA; *Septomyxa affine*, AL.

LEAF SPOT; White Spot. *Cercospora brassicae*, MA to FL, IN, OR, TX; *Pseudocercospora capsellae*, CA.

MOLD, Seed. *Alternaria tenuis*, cosmopolitan; *Stemphylium botryosum*, occasional; *Curvularia inaequalis*.

NEMATODE, Root. *Pratylenchus pratensis*, MD.

NEMATODE, Root Knot. *Meloidogyne* spp., AL, AZ, FL, OR, TX.

NONPARASITIC. **Brown Heart.** Boron deficiency, CA, MA, MN, VA, WI.

POWDERY MILDEW. *Erysiphe polygoni*, northeastern states to CA, FL, TX, WA; *Erysiphe cruciferarum*, WY.

ROT, Root. *Phymatotrichum omnivorum*, TX; *Pythium* sp., NY.

ROT, Watery Soft. *Sclerotinia sclerotiorum*, CT, MD, MS, TX, WA.

SCAB. *Streptomyces scabies*, CT, MI, NJ, Canada.

SCAB, Acid. *Streptomyces acidiscabies*, ME.

VIRUS. **Turnip Mosaic**, AL; **Beet Curly Top**, CA; **Radish Mosaic**; **Turnip Ringspot**, OH.

WHITE RUST; White Blister. *Albugo candida*, general.

WILT; Yellows. *Fusarium oxysporum* f. sp. *conglutinans*, IN, MS, TX.

The control of turnip diseases is about the same as for cabbage and other crucifers.

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## Turpentine Tree (*Syncarpia*)

NEMATODE, Root Knot. *Meloidogyne* sp., FL.

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### Turtle-Head (*Chelone*)

LEAF SPOT. *Septoria mariae-wilsonii*, ME to PA, OH, WI.

POWDERY MILDEW. *Golovinomyces cichoracearum*, and *Erysiphe polygoni*, widespread.

RUST. *Puccinia andropogonis* var. *penstemonis* (0, I), CT, MA, NJ, NY, PA, TN; II, III on *Andropogon*; *P. chelonis* (III), OR, WA.

VIRUS. **Tomato Spotted Wilt**, PA.

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### Udo (*Aralia cordata*)

BLIGHT. *Alternaria* sp., DE, NJ.

ROT, Stem. *Sclerotinia sclerotiorum*, MD.

WILT. *Verticillium albo-atrum*, ME, PA.

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### Umbrella-Pine (*Sciadopitys*)

BLIGHT, Twig. *Diplodia pinea*, NJ.

LEAF SPOT. *Phyllosticta* sp., RI; *Cytospora* sp., OR.

ROT, Root; Damping-off. *Rhizoctonia solani*, CT.

ROT, Root; Wilt. *Phytophthora cinnamomi*, VA.

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### Umbrellawort (*Oxybaphus*)

DOWNY MILDEW. *Peronospora oxybaphi*, KS, SD.

LEAF SPOT. *Ascochyta oxybaphi*, IA, WI; *Cercospora oxybaphi*, IL, IA, KS, NE, OH, TX.

ROT, Root. *Phymatotrichum omnivorum*, TX.

WHITE RUST. *Albugo platensis*, AL.

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### Unicorn-Plant, Proboscis-Flower (*Proboscidea*)

BLIGHT, Southern. *Sclerotium rolfsii*, TX.

LEAF SPOT. *Cercospora beticola*, IA, KS, OK, TX, WI.

NECROSIS, Vascular. *Verticillium dahliae*, NM. ROT, Root. *Phymatotrichum omnivorum*, TX. ROT, Stem. *Sclerotinia sclerotiorum*, MA.

VIRUS. **Bean Yellow Mosaic Virus**, NY. Also susceptible to **Cucumber Mosaic**, **Tobacco Etch**, **Tobacco Mosaic**, **Tobacco Necrosis**, **Tobacco Ring Spot**, **Tomato Ring Spot**, **Alfalfa Mosaic**, **Broad Bean Wilt**, **Lettuce Mosaic**, **Pea Seedborne Mosaic**, **Potato Virus Y**, **Turnip Mosaic**, **Watermelon Mosaic**.

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### Uvularia (Bellwort, Merry-Bells)

LEAF SPOT. *Sphaeropsis cruenta*, CT, IL, IN, IA, MO, NY, VA, WI.

RUST. *Puccinia sessilis* (0, I), DE, IA, MN, MO, NY, ND, WI; *Uromyces acuminatus* var. *magnatus* (0, I), MS, WI.

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### Valerian, Garden Heliotrope (*Valeriana*)

LEAF SPOT. *Ramularia centranthi*, CA; *Septoria valerianae*, WI.

POWDERY MILDEW. *Golovinomyces cichoracearum*, CO, UT.

ROT, Root. *Rhizoctonia solani*, NY.

ROT, Stem. *Sclerotinia rolfsii*, CT, NJ.

RUST. *Puccinia commutata* (0, I, III), NY, OR; *P. dioicae* (0, I), CO, NM, UT; II, III on *Carex*; *P. valerianae* (II, III), AK.

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### Valerian, Red, Jupiters-Beard (*Centranthus*)

LEAF SPOT. *Ramularia centranthi*, CA.

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### Valerianella (Corn-Salad or Lamb's Lettuce)

DOWNY MILDEW. *Peronospora valerianellae*, CA.

GALL, Leaf. *Synchytrium aureum*, MS.

LEAF SPOT. *Septoria valerianellae*, MS, TX.

POWDERY MILDEW. *Golovinomyces orontii*, CA.

ROT, Root. *Phymatotrichum omnivorum*, TX;  
*Thielaviopsis basicola*, PA.

ROT, Stem and Crown. *Sclerotinia minor*, CA.

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## Vancouveria

LEAF SPOT. *Phragmodothis berberidis*, CA;  
*Ramularia vancouveriae*, CA, OR.

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## Vanilla

BLACK MILDEW. *Lembosia rolfsii*, FL.

LEAF SPOT; Pod Spot. *Botryosphaeria vanillae*, FL;  
*Volutella vanillae*, FL.

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## Vanilla-Leaf (*Achlys*)

LEAF SPOT. *Ascochyta achlyicola*, WA;  
*Stagonospora achlydis*, OR.

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## Velvet Bean (*Stizolobium*)

BACTERIAL Spot. *Pseudomonas syringae*, IN;  
*P. stizolobii*, NC.

BLIGHT, Southern. *Sclerotium rolfsii*, AL,  
FL, GA.

LEAF SPOT. *Cercospora stizolobii*, AL, FL, GA,  
NC, SC; *Mycosphaerella cruenta*, GA;  
*Phyllosticta macunae*, AL.

NEMATODE, Root Knot. *Meloidogyne* spp., CA,  
TX.

ROT, Pod Spot. *Fusarium* sp., TX.

ROT, Root. *Phymatotrichum omnivorum*, AZ,  
TX; *Phytophthora parasitica*, FL.

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## Venus Flytrap (*Dionaea muscipula*)

ROT, Root. *Phytophthora cinnamomi*, NC.

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## Veratrum (False-Hellebore)

LEAF SPOT. *Ascochyta veratrina*, WA;  
*Cylindrosporium veratrinum*, CA, NY, UT,  
VA, WA; *Cercospora terminalis*, NY;  
*Phyllosticta melanoplaca*, CA, CT, ID, UT.

LEAF SPOT, Tar. *Phyllachora melanoplaca*, NY.  
RUST. *Puccinia atropuncta* (II, III), MO, NC,  
OK, TN, VA, WV; 0, I on composites;  
*P. veratri*, widespread; 0, I on *Epilobium*.

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## Verbascum

BACTERIAL, Proliferation. *Rhodococcus fascians*,  
OR.

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## Verbena, Garden (*Verbena hortensis*)

BLIGHT, Flower. *Botrytis cinerea*, MA.

NEMATODE, Root Knot. *Meloidogyne* sp., MD.

POWDERY MILDEW. *Golovinomyces*  
*cichoracearum*, general.

ROT, Charcoal. *Macrophomina phaseoli*, OK.

ROT, Root. *Phymatotrichum omnivorum*, TX;  
*Rhizoctonia solani*, NY; *Thielaviopsis*  
*basicola*, PA.

VIRUS. Broad Bean Wilt, FL; *Nemesia Ring*  
*Necrosis Tymovirus*, CA; *Angelonia Flower*  
*Break Carmovirus*; *Verbena Virus Y*,  
*Potatao Virus Y*, *Potyvirus*, AR, OR.

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## Verbena (Native Species)

BLIGHT, Web. *Rhizoctonia solani*, LA.

BREAK CARMOVIRUS.

BROOMRAPE. *Orobanche ramosa*, TX.

DODDER. *Cuscuta arvensis*, OK.

DOWNY MILDEW. *Plasmopara halstedii*, NM.

LEAF SPOT. *Ascochyta verbenae*, WI;  
*Cercospora verbenicola*, AL, LA, TX;  
*Phyllosticta texensis*, TX; *Septoria*  
*verbenae*, VT to MS, SD, TX.



POWDERY MILDEW. *Golovinomyces cichoracearum*, general.

ROT, Root. *Phymatotrichum omnivorum*, TX.

RUST. *Puccinia aristidae* (0, I), AZ; II, III on grasses; *P. vilfae* (0, I), IN to OK, SD; II, III on *Sporobolus*.

VIRUS. **Bean Yellow Mosaic**, CA; **Bidens Mot-tle**, FL; **Clover Yellow Mosaic**, FL; **Tomato Spotted Wilt**, GA; **Nemesia Ring Necrosis Tymovirus**, CA; **Angelonia Flower Break Carmovirus**.

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### **Verbena (*Nemisia diascia*)**

NEMESIA RING NECROSIS. **Tymovirus**, CA; **Angelonia Flower Break Carmovirus**.

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### **Verbesina (Crownbeard)**

DOWNY MILDEW. *Plasmopara halstedii*, NM, TX.

LEAF SPOT. *Cercospora fulvella*, TX; *Colletotrichum* sp., also stem spot; *Phyllosticta verbesinae*, TX.

NEMATODE, Root Knot. *Meloidogyne* sp., AL.

POWDERY MILDEW. *Golovinomyces cichoracearum*, SC, TX, VA.

ROT, Root. *Helicobasidium purpureum*, TX; *Phymatotrichum omnivorum*, TX.

RUST. *Coleosporium viguierae* (II, III), AZ, FL, NC, TX; 0, I unknown; *Puccinia abrupta* (II, III), CA, TX; *P. cognata* (0, I, II, III), AR, LA, TN, TX; *P. verbesinae* (0, I, II, III), MD to AL, LA.

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### **Veronica (Speedwell)**

BACTERIAL, Proliferation. *Rhodococcus fascians*, OR.

DOWNY MILDEW. *Peronospora grisea*, CA, GA, KS, IL, IN, MO, NY, TX, WI.

GALL, Leaf. *Synchytrium globosum*, LA; *Sorosphaera veronicae*, CO, MS.

LEAF SPOT. *Cercospora tortipes*, WI; *Gloeosporium veronicae*, NY; *Ramularia veronicae*, OK, TX, WI; *Septoria veronicae*, CA, FL, IA, MI, OH, WI.

NEMATODE, Root Knot. *Meloidogyne* spp., FL.

POWDERY MILDEW. *Sphaerotheca macularis*, CT, IA, OR, WI.

ROT, Root and Stem. *Fusarium* sp., NJ; *Rhizoctonia solani*, IL, MD; *Phymatotrichum omnivorum*, TX.

ROT, Stem. *Sclerotium rolfsii*, CT, NJ, OH.

RUST. *Puccinia albulensis* (III), CO, MT, OR, UT, WA, WY; *P. probabilis* (II, III), NM; *P. rhaetica* (III), WA; *P. veronicarum* (III), IA, WI.

SMUT, Leaf. *Entyloma veronicae*, CO, CT, IL, IA, KS, MS, MO, NY, TX, WI; *Urocystis kmetiana*, GA.

VIRUS. **Cucumber Mosaic**, AR; **Tomato Spotted Wilt**, PA.

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### **Vetch (*Vicia*)**

BLIGHT, LEAF. *Ascochyta fabae* f. sp. *vicia*, CT.

LEAF SPOT. *Ramularia sphaeroidea* (also stem), CA.

LEAF SPOT, Chocolate. *Botrytis fabae*, CT.

NEMATODE, Ring. *Mesocriconema* (formerly *Criconemella*), SC.

VIRUS. **Broad Bean Severe Chlorosis**, MI; **Broad Bean Wilt**.

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### **Viburnum**

BACTERIAL Crown Gall. *Agrobacterium tumefaciens*, PA, WA.

BACTERIAL Leaf Spot. *Pseudomonas viburni*, IL, IA, NJ.

BLIGHT. *Phytophthora ramorum*, OR, WA.

BLIGHT, Gray Mold; Shoot. *Botrytis cinerea*, MA, WA.

BLIGHT, Sudden Oak Death. *Phytophthora ramorum*, CA.

BLIGHT, Thread. *Pellicularia koleroga*, FL, NC.

CANKER, Stem Girdle. **Hymenochaete agglutinans**, PA.

DODDER. **Cuscuta compacta**, FL.

DOWNY MILDEW. **Plasmopara viburni**, general.

GALL, Stem; Dieback. **Phomopsis** sp., MD, NJ, NY.

LEAF SPOT. **Cercospora opuli**, IA, MS; **C. tinea**, LA; **C. varia**, general; **Helminthosporium beaumontii**, AL, TX; **Hendersonia foliorum** var. **viburni**, FL, TX; **H. tini**, LA; **Leptosphaeria tini**, LA; **Monochaetia desmazierii**, WV; **Phyllosticta lantanoides**, NY; **P. punctata**, FL, IA, WI; **P. tinea**, MD; **Ramularia viburni**, TN, WI.

LEAF SPOT. **Cristulariella pyramidalis**, MD.

LEAF SPOT, Algal. **Cephaleuros virescens**, FL, LA.

MOLD, Leaf. **Cladosporium herbarum**, OH, PA.

NEMATODE, Root Knot. **Meloidogyne** spp., CA, MD, MS.

POWDERY MILDEW. **Microsphaera alni**, general.

ROT, Root. **Clitocybe tabescens**, FL; **Corticium falactinum**, MD; **Phymatotrichum omnivorum**, TX; **Rosellinia necatrix**, CA; **Phytophthora cinnamomi** VA.

RUST. **Aecidium rubromaculans** (0, I), FL; **Coleosporium viburni** (II, III), IL, IA, MD, MI, VA, WI; 0, I unknown; **Puccinia linkii** (III), AK, ID, MI, MT, NH, WA.

SPOT ANTHRACNOSE. **Sphaceloma viburni**, CA, WA.

WILT. **Verticillium albo-atrum**, IL, IN, OR, WA.

*Viburnum carlesii* is extremely sensitive to sulfur and may be injured even by spray drift from other plants.

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### Vidalia Sweet Onion (*Allium*)

DOWNY MILDEW. **Peronospora destructor**, GA.

ROT, Bulb. **Botrytis tulipae**, GA.

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### Vinca (Periwinkle, Ground-Myrtle)

BACTERIAL, MLO. **Aster Yellows**, KS, TX.

BACTERIAL Stunt. **MLO**, AR, OK.

BLIGHT, Foliar. **Phytophthora tropicalis**, VA.

BLIGHT, Gray Mold. **Botrytis cinerea**, CT, WA.

BLIGHT, TWIG. **Colletotrichum dematium**, FL.

CANKER; DIEBACK. **Phomopsis lirella**, CT, MD, NJ, OH, PA, VA; **Phoma** sp., OR.

DODDER. **Cuscuta indecora**, TX.

FLOWER, Spot and Blight. **Choanephora cucurbitarum**, LA.

LEAF SPOT. **Alternaria** sp., PA, TX; **Colletotrichum** sp., FL; **Macrophoma vincae**, also dieback, IL, NY; **Phyllosticta** sp., CT, GA, NJ; **P. minor**, MD, NJ, NY, VA; **P. vincae-majoris**, CA; **Septoria vincae**, NJ, NY; **Volutella vincae**, NY, PA.

MOLD, Leaf. **Cladosporium herbarum**, ME, NY, PA.

NEMATODE, Dagger. **Xiphinema americanum**, WI.

NEMATODE, Root Knot. **Meloidogyne** sp., CA, KS, OH.

ROT, Root. **Phytophthora cactorum**, NC; **P. lateralis**, NC.

ROT, Root, Black. **Thielaviopsis basicola**, FL.

ROT, Root and Stem. **Rhizoctonia solani**, IL, MD, NJ, PA. **Phytophthora parasitica**, MD.

RUST. **Puccinia vincae** (0, I, II, III), MA, MI, NY, WA.

SPOT, Target. **Corynespora cassiicola**, FL.

VIRUS. **Cucumber Mosaic**, NJ; **Potato Yellow Dwarf**, CA; **Tomato Spotted Wilt-Impatiens Serotype**, FL, GA.

WILT. **Verticillium albo-atrum**, CA, OR.

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### Vincetoxicum (Milkvine)

DOWNY MILDEW. **Plasmopara gonolobi**, MD to FL, TX.

LEAF SPOT. **Cercospora bellynckii**, TX.

ROT, Root. **Phymatotrichum omnivorum**, TX.

RUST. **Puccinia obliqua** (III), FL to KY, AZ, OK; **Uromyces asclepiadis** (II, III), IN, WV.

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### Violet (*Viola odorata* and Native Species)

ANTHRACNOSE. **Colletotrichum violae-tricoloris**, CT, MA, MS, NJ, NY, OH, PA.

BLIGHT, Southern. **Sclerotium rolfsii**, VA to FL, CA, CT, NY, TX, VT.

DOWNY MILDEW. **Bremiella megasperma**, FL, IL, IA, MN, NJ.

GALL, Leaf. **Synchytrium aureum**, NY, WI.

LEAF SPOT. **Alternaria violae**, CT to GA, TX, WI; **Ascochyta violicola**, AK; **A. violae**, IN, IA, PA, WI; **Centrospora acerina**, AK, CA; **Cercospora granuliformis**, ME to AL, OK, SD; **C. violae**, MA to FL, ND, TX; **Cryptostictis violae**, IL; **Cylindrosporium violae**, MT; **Heterosporium** sp., AK; **Marssonina violae**, MA to SC, IA, MN; **Phyllosticta violae**, MA to FL, CA, KS, MN; **P. nigrescens**, CA; **Ramularia lactea**, AK, CO, MS, MT; **R. agrestis**, NE, OR; **Septoria violae**, northeastern and North central states to AK, FL, KS, LA; **Ciborinia violae**.

NEMATODE, Lesion. **Pratylenchus pratensis**.

NEMATODE, Root Knot. **Meloidogyne** spp., FL to CA, occasional in North.

POWDERY MILDEW. **Sphaerotheca macularis**, CA, CO, ND, OR, WI, WY.

ROT, Root. **Fusarium oxysporum** f. sp. **aurantiacum**, FL, MS, OH; **Helicobasidium purpureum**, TX; **Phymatotrichum omnivorum**, TX; **Rhizoctonia solani**, FL, IL, MN, MS, NY; **Thielaviopsis basicola**, CT to MS, KS, MA, OH.

ROT, Wet; Gray Mold. **Botrytis cinerea**, AK, MD, OH.

RUST. **Puccinia violae** (0, I, II, III), general; **P. effusa** (III), CA; **P. ellisiana** (0, I), northeastern and North central states to AL, NM, WY; II, III on *Andropogon*; **P. fergussoni** (III), AK, CO, MT, UT; **Uromyces andropogonis**, (0, I), MS, NJ, NC, PA, TN, WV; II, III on *Andropogon*.

SMUT, Leaf and Stem. **Urocystis violae**, AK, CA, MN, TX, UT.

SOOTY MOLD. **Scorias spongiosa**, ME.

SPOT ANTHRACNOSE; Scab. **Sphaceloma violae**, ME to FL, KS, LA, OH, WA.

VIRUS. **Beet Curly Top**, TX.

Spot anthracnose is an important violet disease in many gardens with disfiguring scabby lesions on stems and leaves.

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### Vipers-Bugloss (*Echium*)

LEAF SPOT. **Cercospora echii**; **Stemphylium** sp., NY.

ROT, Root. **Rosellinia** sp., CA.

ROT, Stem. **Sclerotinia sclerotiorum**, ND.

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### Virginia Creeper (*Parthenocissus quinquefolia*)

BLIGHT, Thread. **Pellicularia koleroga**, FL.

CANKER; DIEBACK. **Coniothyrium fuckelii**, WV; **Cladosporium** sp., NJ.

DOWNY MILDEW. **Plasmopara viticola**, AL, IA, ME, MN, NJ, NY, TX, WI.

LEAF SPOT. **Cercospora ampelopsidis**, widespread; **C. psedericola**, IL, VA; **Guignardia bidwellii** f. sp. **parthenocissi**, general; **Phloeospora ampelopsidis**, IL, IA, NE, WI.

PARASITIC LICHEN. **Strigula elegans** and **S. complanata**, LA, southern US.

POWDERY MILDEW. **Uncinula necator**, general; CAES.

ROT, Root. **Helicobasidium purpureum**, TX; **Phymatotrichum omnivorum**, TX.

SPOT ANTHRACNOSE. **Elsinoë parthenocissi**, FL, MO, NH, PA.

The *Guignardia* leaf spot is commonly disfiguring in a wet season.

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### Vitex (*Chaste-Tree*)

LEAF SPOT. **Cercospora viticis**, LA, TX.

ROT, Root. **Phymatotrichum omnivorum**, TX.

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### Wahlenbergia (*Southern Rockbell*)

VIRUS. **Tomato Spotted Wilt**, GA.

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### Wallflower (*Cheiranthus*)

BACTERIAL, MLO. **California Aster Yellows**, CA.  
BLIGHT, Gray Mold. **Botrytis cinerea**, AK, WA.

LEAF SPOT. *Heterosporium* sp., OK.  
 ROT, Crown. *Rhizoctonia solani*, NJ.  
 WHITE BLISTER. *Albugo candida*, MN.

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### Wallflower, Western (*Erysimum*)

CLUB ROOT. *Plasmodiophora brassicae*, NJ.  
 DOWNY MILDEW. *Peronospora parasitica*, CO, ID, IA.  
 LEAF SPOT. *Cercospora erysimi*, WI.  
 POWDERY MILDEW. *Erysiphe polygoni*, CA.  
 ROT, Root. *Rhizoctonia solani*, TX.  
 RUST. *Puccinia aristidae* (0, I), AZ, CO, ND, NE, UT; *P. consimilis* (I, III), MT; *P. holboellii* (0, III), CO.  
 VIRUS. **Tomato Spotted Wilt**, CA.  
 WHITE RUST; White Blister. *Albugo candida*, ID, OR, TX.

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### Walnut (*Juglans*) (Includes Bitternut, Black, English, and Japanese Walnuts)

ANTHRACNOSE; Leaf Spot. *Gnomonia leptostyla* (*Marssonina juglandis*), general.  
 BACTERIAL Blight. *Xanthomonas juglandis*, NY to GA, TX, and Pacific Coast, especially on English (Persian) walnut.  
 BACTERIAL Canker. *Erwinia nigrifluens*, CA; *E. rubrifaciens*, phloem canker, CA; *Sirococcus clavignenti-juglandacearum*, NC.  
 BACTERIAL Crown Gall. *Agrobacterium tumefaciens*, occasional.  
 BLIGHT, Leaf. *Cylindrosporium juglandis*, AL and TN to TX, CA.  
 BLIGHT, Seedling. *Sclerotium rolfsii*, TX.  
 CANKER. *Sirococcus clavignenti-juglandacearum* to *Ophiognomonia clavignenti-juglandacearum*, Ontario, Canada; *Phomopsis oblonga*, CT.  
 CANKER; Branch Wilt. *Hendersonula toruloidea*, connected with sunburn.  
 CANKER; DIEBACK. *Diplodia juglandis*, wide-spread; *Dothiorella gregaria*, CA; *Exosporina fawcetti*, wilt, CA; *Melanconis juglandis*, widespread, especially in East;

*Nectria* spp., widespread; *N. galligena*; *Cytospora* sp., AZ.  
 CANKER; Felt Fungus. *Septobasidium curtisii*, NC.  
 CANKER, Stem. *Fusarium solani*, KS; *Phytophthora citricola*, NC.  
 CANKER DISEASE. *Geosmithia*, AZ, CA, CO, ID, OR, UT, WA.  
 DIEBACK, Twig and Branch. *Neofusicoccum mediterraneum*, CA.  
 LEAF SPOT. *Cercospora juglandis*, KS, MA; *Phloeospora multimaculans*, TX; *Marssonina californica*, CA; *Ascochyta juglandis*, ring spot; *Grovesinia pyramidalis*, IL, IA, MN, OH, WV; *Mycosphaerella juglandis*, IL, IN, IA, NC; *Cristulariella pyramidalis*, IL. Also on *Bidens frondosa* (beggar-ticks), *Campsis radicans* (trumpet vine), *Chenopodium ambrosioides* (Mexican tea), *Commelina diffusa* (dayflower), *Cuphea petiolota* (blue waxweed), *Desmodium canescens* (tick clover), *Eupatorium coelestinum* (mist-flower), *E. rugosum* (white snakeroot), *Ipomoea hederacea* (morning-glory), *I. lacunosa* (morning-glory), *Lobelia inflata* (Indian tobacco), *L. siphilitica* (blue cardinal-flower), *Perilla frutescens* (beefsteak plant), *Phytolacca arnericana* (poke), *Platanus occidentalis* (sycamore), *Polygonum pennsylvanicum* (smart weed), *P. scandens* (false buckwheat), *Rumex crispus* (yellow dock), *Sida spinosa* (prickly mallow), *Solidago canadensis* (goldenrod), *Vitis palmata* (Catbird grape).  
 LEAF SPOT; Downy Spot; White Mold. *Microstroma juglandis*, wide-spread; *M. brachysporum*, general; *Alternaria arborescens*, *A. alternata*, *A. tenuissima* (leaf spot and brown/gray apical necrosis), AZ.  
 MISTLETOE. *Phoradendron serotinum* (*flavescens*), IN southward, AZ, CA, NM.  
 MOLD, Nut. *Alternaria* sp., CA.  
 NEMATODE, Lesion. *Pratylenchus musicola*, CA; *P. vulnus*.  
 NEMATODE, Root Knot. *Meloidogyne* spp., TX.  
 NONPARASITIC. **Black End**, of Nuts. Probably drought injury, CA, OR.

**Black Line**, Girdle. Graft incompatibility.

**Dieback**. Boron deficiency, OR.

**Erinose**. Leaf galls from blister mites.

**Leaf Scorch, Sunscald**. NJ, OR, WA.

**Little Leaf**. Zinc deficiency, CA. Probably also causes Rosette.

**Shrivel**, Witches' Broom, Yellows. Cause unknown.

PHYTOPLASMA, **Witches' Broom**, GA, IL, IN, IA, OH.

POWDERY MILDEW. **Phyllactinia corylea**, IN, OH, OR; **Microsphaera alni**, widespread; **Erysiphe polygoni**, CA.

ROT, Collar. **Phytophthora cactorum**, CA; **P. cinnamomi**, MD to AL, LA.

ROT, Heart. **Fomes igniarius** and **F. everhartii**, widespread; **Polyporus sulphureus**, widespread.

ROT, Root. **Armillaria mellea**, cosmopolitan; **Phymatotrichum omnivorum**, TX; **Cylindrocladium** sp., TN.

ROT, Wood. **Fomes conchatus**; **Polyporus** spp.; **Poria** spp.; **Schizophyllum commune**, cosmopolitan; **Daedalea confragosa**; **D. quercina**, widespread.

SCAB. **Cladosporium** sp., MD, MN.

VIRUS. **Brooming Disease**, DC, GA, MD, NY.

Bacterial blight is the most serious disease of walnuts on the Pacific Coast, requiring several sprays. A toxin, juglone, has been considered injurious to many shrubs growing in the vicinity of black walnut roots; the toxin also causes vascular wilt-like symptoms in eggplant and tomato in home gardens.

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### Water-Cress (*Nasturtium Officinale*)

DAMPING-OFF. **Rhizoctonia solani**, TX.

LEAF SPOT. **Cercospora nasturtii**, CA, CT, FL, IN, NH, TX, WI.

ROT, Root. **Pythium debaryanum**, TX; **Sporgospora subterranea** f. sp. **nasturtii**, FL, PA; **Phytophthora cryptogea**, and stem, FL.

RUST. **Puccinia aristidae**, AZ, CO, TX.

VIRUS. **Western Aster Yellows Phytoplasma**, HI.

VIRUS, Mosaic and Stunting. **Turnip Virus**, Brazil.

WHITE RUST; White Blister. **Albugo candida**, MN.

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### Water-Elm (*Planera*)

ROT, Wood. **Daedalea ambigua**, SC; **Ganoderma lucidum**.

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### Water-Horehound (*Lycopus*)

GALL, Leaf. **Synchytrium cellulare**, WI.

LEAF SPOT. **Ascochyta lophanthi**, MA, WI; **Cercospora lycopi**, LA; **Phyllosticta decidua**, IA, OK, WI; **Septoria lycopi**, WI.

RUST. **Puccinia angustata** (0, I), ME to MD, KS, ND; II, III on grasses.

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### Water-Hyacinths (*Eichhornia*)

BLIGHT. **Aquathanatephorus pendulus** (*Rhizoctonia* stage), LA.

LEAF SPOT. **Cercospora piaropi**, FL.

ROT, Root and Crown. **Mycoleptodiscus terrestris**, FL.

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### Water-Lily (*Nymphaea*)

LEAF SPOT. **Alternaria** sp., TX; **Cercospora exotica**, IL; **C. nymphaeacea**, scattered ME to TX, CA; **Helicoceras nymphaerum**, MD, NJ, NY; **Mycosphaerella pontederiae**, MI, VA; **Ovularia nymphaearum**, MD, NY, WA; **Phyllosticta fatiscens**, VT; **Dichotomophthoropsis nymphaerum**, MN; **Sclerotium** sp., MN.

ROT, Leaf and Stem. **Pythium** spp., MA, NY, WI. SMUT, White. **Entyloma nymphaeae**, MA to VA, OK, WI.

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### Water-Lily, Yellow Pond-Lily (*Nuphar*)

LEAF SPOT. **Dichotomophthoropsis nymphaerum**, MN.

LEAF SPOT. *Mycosphaerella pontederiae*, ME, MI, NY, VA, WI; *Phyllosticta fatiscens*, IA, NJ, NY, WI.

SMUT, White. *Entyloma nymphaeae*, CT, IL, MA, WI.

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## Watermelon (*Citrullus*)

ANTHRACNOSE. *Colletotrichum lagenarium*, general, Pacific Coast; *C. orbiculare*, CA; *Marssonina melonis*, NY.

BACTERIAL, Angular Leaf Spot. *Pseudomonas pseudoalcaligenes* subsp. *citrulli*, GA.

BACTERIAL Fruit Blotch. *Acidovorax avenae* (syn. *Pseudomonas pseudoalcaligenes*) subsp. *citrulli*, DE, IL, IN, OR, TX.

BACTERIAL Rind Necrosis. *Erwinia* sp., TX.

BACTERIAL Soft Rot. *Erwinia aroideae*, WV; wilt, *E. tracheiphila*, rare.

BACTERIAL Spot. *Pseudomonas lachrymans*, MI.

BACTERIAL Wilt. *Erwinia tracheiphila*, NM.

BLIGHT, Gummy Stem; Fruit Spot. *Didymella bryoniae*, CA; *Mycosphaerella citrullina*, also stem-end rot, leaf spot, MA to FL, AZ, MO.

BLIGHT, Southern. *Sclerotium rolfsii*, also fruit rot, NC to FL, TX.

CANKER, Stem. *Myrothecium roridum*, GA.

DAMPING-OFF. *Rhizoctonia solani*, soil rot, leaf blight; *Pythium* spp., also blossom-end rot, foot rot.

DOWNY MILDEW. *Pseudoperonospora cubensis*, occasional from MA to FL, TX, WI; also CA.

FRUIT SPOT; Speck. *Cribropeltis citrullina*, IL.

LEAF SPOT. *Alternaria cucumerina*, general except Pacific Coast; *A. alternate* f. sp. *cucurbitae*, MD. *Cercospora citrullina*, NJ to FL, OH, TX; *Corynespora cassicola*; *Myrothecium roridum*, GA.

NEMATODE, Root knot. *Meloidogyne arenaria*; *M. incognita*; *M. javanica*.

NONPARASITIC. Blossom-End Rot. Hot dry weather after cool, moist days.

Internal Browning. Drought and nutritional deficiencies.

POWDERY MILDEW. *Golovinomyces cichoracearum*, AZ, CA, FL, GA, NY, NC, TX, VA. May make pimples in young fruit; *Podosphaera xanttii*, FL.

ROT. *Diplodia* spp., stem-end, gray; MD to FL, AZ, KS; *Fusarium scirpi*, occasional in market; *Helminthosporium* sp., TX; *Rhizopus* spp., mushy soft rot.

ROT, Charcoal. *Macrophomina phaseoli*, TX.

ROT, Root. *Acremonium* sp., CA; *Phymatotrichum omnivorum*, AZ, TX; *Thielaviopsis basicola*, OR, UT; *Monosporascus cannonballus*, CA, Brazil.

ROT, Stem and Fruit. *Phytophthora cactorum*, AZ; *P. capsici*, CO; *P. citrophthora*, CA; *Sclerotinia sclerotiorum*, NJ, TX.

SCAB; Leaf Mold. *Cladosporium cucumerinum*, MD, NE.

VIRUS. Watermelon Mosaic, NY to FL, AZ, CA, IA, MI, TX, WA; Beet Curly Top; Tobacco Ring Spot; Watermelon Stunt (strain of Squash Mosaic); Zucchini Yellow Mosaic, CA; Watermelon Curly Mottle, AZ; Papaya Ring Spot, LA; Squash Leaf Curl, TX; Lettuce Infectious Yellows, AZ, CA, TX; Tomato Spotted Wilt, GA; Cucurbit Leaf Crumple, CA; Squash Vein Yellowing, IN; Cucurbit Yellow Stunting, AZ, Mexico.

WILT. *Fusarium oxysporum* f. sp. *niveum*, GA, general and Race 2, DE, IN, MD; Race 3, MD; *Verticillium albo-atrum*, CA, NH, OR; *V. dahlia*, TX, *Rhizoctonia solani* AG-7, IN.

*Fusarium* wilt is probably the major disease and resistant varieties are available. For anthracnose and leaf spots treat seed before planting, and start spraying or dusting when vines start to run.

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## Water-Primrose (*Jussiaea*)

LEAF SPOT. *Alternaria* sp. OK; *Cercospora jussiaeae*, AL, OK, TX; *Colletotrichum jussiaeae* AL, TX; *Septoria jussiaeae* AL, FL, LA, TX.

RUST. *Aecidium betheli*, CA; *Puccinia jussiaeae* (0, I, III), MS; *Uredo guanabensis* (II), FL.

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**Water Shield (*Brasenia*)**

LEAF SPOT. *Dichotomophthoropsis nymphaearum*, MN.

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**Watsonia**

ROT, Root. *Armillaria mellea*, CA.

VIRUS. *Iris Mosaic*, CA.

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**Wax-Myrtle, Candleberry (*Myrica cerifera*)**

BLACK MILDEW. *Irene calostroma*, Gulf states; *Irenina manca*, MS; *Meliola manca*, FL.

BLIGHT, Seedling. *Rhizoctonia solani*, NJ.

DODDER. *Cuscuta compacta*, FL.

LEAF SPOT. *Cercospora dispersa*, NJ; *Colletotrichum acutatum*, FL; *Phyllosticta myricae*, NJ to FL, TX; *Septoria myricae*, NJ.

NEMATODE, Ring. *Hemicriconemoides wessoni*, FL.

PARASITIC LICHEN. *Strigula elegans* and *S. complanata*, LA, Southern US.

ROT, Root. *Clitocybe tabescens*, FL; *Phymatotrichum omnivorum*, TX.

RUST. *Gymnosporangium ellisii* (0, I), MA to MD; III on *Chamaecyparis*.

SOOTY MOLD. *Capnodium grandisporum*, FL.

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**Weigela**

BACTERIAL Crown Gall. *Agrobacterium tumefaciens*, MD, MS.

BLIGHT, Twig. *Phoma weigela*, WA.

LEAF SPOT. *Cercospora weigela*, MD, MS, NJ; *Ramularia diervillae*, TN.

NEMATODE, Lesion. *Pratylenchus pratensis*.

NEMATODE, Root Knot. *Meloidogyne* sp., CA, MD, MS, TX.

ROT, Root. *Phymatotrichum omnivorum*, TX.

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**Wheat (*Triticum*) Cereal**

BLIGHT, Heat. *Fusarium tricinctum*, Argentina.

BLIGHT, Seedling. *Sclerotium rolfsii*, OK.

LEAF SPOT, Tan. *Pyrenophora tritici-repentis*, KS, Pacific Northwest.

NEMATODE, Cereal Cyst. *Heterodera filipjevi*, OR, Pacific Northwest.

POWDERY MILDEW. *Blumeria graminis* f. sp. *tritici*, NC, WI; *Erysiphe graminis*, *Septoria tritici*, Stagonospora, WI.

ROT, Damping-Off, Stunting. *Pythium abappressorium*, WA; *Arthrivirus sacchari*, (Durum Wheat), Saskatchewan, Canada.

ROT, Root. *Phoma sclerotoides*, MN.

RUST. *Puccinia triticina*, (Durum Wheat), Mexico.

RUST, Stripe. *Puccinia striiformis* f. sp. *tritici*, FL.

RUST, Wheat Leaf. *Puccinia triticina*, (Red Spring Wheat), MN, ND.

STUNT, Leaf Stripe. *Cephalosporium gramineum*, VA.

VIRUS. *Triticum Mosaic*, Southern Great Plains, KS, OK, TX; *Soilborne Wheat Mosaic*, OR.

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**Whipplea**

DOWNY MILDEW. *Peronospora whippleae*, CA.

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**Whortleberry, Bilberry (*Vaccinium* spp.)**

BLIGHT, Twig; Berry Rot. *Monilinia ledi*, NY.

GALL, Leaf. *Exobasidium vaccinii*, occasional; *E. parvifolii*, stem gall, OR, WA; *E. vaccinii-uliginosi*, shoot gall, rose-bloom, OR.

LEAF SPOT, Tar. *Rhytisma vaccinii*, AK.

POWDERY MILDEW. *Microsphaera alni* var. *vaccinii*, AK, OR, WA, WY; *Podosphaera oxyacanthae*, AK.

ROOT, Rot. *Phytophthora cinnamomi*, VA; *P. nicotianae*, VA; *P. palmivora*, VA.

RUST. **Pucciniastrum** sp. (II), OR, WA; **P. goeppertianum** (III), Witches' Broom, general; 0, I on fir; **P. vaccinii** (II, III), general; 0, I on hemlock.

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**Wild Garlic (*Allium vineale*);  
Wild Mustard (*Brassica kaber*)**

WILT, Water-soaked foliage. **Sclerotinia minor**, NC.

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**Wild Rice (*Zizania*)**

ANTHRACNOSE. **Colletotrichum sublineolum**, MN.

BACTERIAL Leaf Spot. **Pseudomonas syringae** pv. **syringae**, MN, Pacific Northwest; **P. syringae** pv. **zizaniae**, Pacific Northwest.

BLIGHT, HEAD. **Fusarium graminearum**, MN.

LEAF SPOT, Stem Lesion. **Bipolaris sorokiniana**, Pacific Northwest; **Sclerotium oryzae**, Pacific Northwest; **S. hydrophilum**, Pacific Northwest.

LEAF SPOT, Zonate. **Drechslera gigantea**, MN.

ROT, Crown, Root. **Phytophthora erythroseptica**, CA; Damping-off. **Pythium torulosum**, CA.

SMUT. **Entyloma lineatum**, Pacific Northwest; **Ustilago esculenta**, CA.

VIRUS. **Wheat Streak Mosaic**, MN.

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**Wildrye (*Elymus*)**

LEAF SPOT. **Pyrenophora trichostoma**, ND; **Septorium spraguei**, ND.

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**Willow (*Salix*) (Includes Weeping Willow, Pussy Willow)**

BACTERIAL Crown Gall. **Agrobacterium tumefaciens**, CT, NJ, TX, VA.

BACTERIAL Wetwood. **Erwinia nimipressuralis**.

BLIGHT, Twig. **Diplodia salicina**.

BLIGHT, Willow. Complex of scab and black canker.

CANKER, Black. **Physalospora miyabeana**, New England, NY, WV.

CANKER, Twig and Branch. **Botryosphaeria ribis**, VA to GA, AR, CA; **Cryptodiaporthe salicina**, ME to VA, AK, CA, KS, OK, SD, WA; **Cryptomyces maximus**, bark blister; NM, UT; **Discella carbonacea**, twig blight, New England; **Dothiora polyspora**, CO; **Dothiorella** sp., AR, ND; **Macrophoma** spp., AR, KY, MS, NC, SC, TX; **Phomopsis salicina**, IA, MA, VA; **Physalospora gregaria**, WV; **Valsa** spp., twig canker; **V. sordida** (*Cytospora chrysosperma*), widespread; **V. salicina**, widespread; **V. nivea**, western states.

DODDER. **Cuscuta** spp., IA, NY, WA.

LEAF BLISTER. **Taphrina populi-salicis**, CA.

LEAF SPOT. **Ascochyta salicis**, CA; **Cercospora salicina**, IL, LA, MD, TX; **Ciborinia foliicola**; **C. wisconsinensis**; **Cylindrosporium salicinum**, MA to CO, MS, WI; **Gloeosporium** spp., also twig blight, CT, DE, MA; **G. salicis**, VT to NJ, MS, OR, WI; **Marssonina** spp., widespread; **M. kriegleriana**, WI; **M. apicalis**, CA; **Myrioconium comitatum**, WI; **Phyllosticta apicalis**, KS, WI; **Ramularia rosea**, CO, MT, WI; **Septogloeum salicinum**, AK, NY, WI; **S. maculans**, CA, MT; **S. salicis-fendlerianae**, ID; **Septoria** spp.; **S. salicicola**, AK, OR; **S. didyma**, WI.

LEAF SPOT, Tar. **Rhytisma salicinum**, MI.

MISTLETOE. **Phoradendron serotinum** (**flavescens**), AZ, CA, IN, NM, TX.

MISTLETOE, European. **Viscum album**, CA.

NEMATODE, Lesion. **Pratylenchus vulnus**, CA.

NEMATODE, Root Knot. **Meloidogyne** sp.

POWDERY MILDEW. **Uncinula salicis**, general; **Phyllactinia corylea**, WA.

ROT, Heart. **Daedalea confragosa**, widespread; **Fomes** spp.; **Polyporus farlowii**, TX to CA; **Trametes suaveolens**, New England to MT, AK.

ROT, Root. **Armillaria mellea**, CA, WA; **Helicobasidium purpureum**, TX; **Phymatotrichum omnivorum**, TX.

ROT, Sapwood; Wood. **Daedalea ambigua**; **Ganoderma lucidum**; **Pholiota** spp.;



**Pleurotus** spp.; **Polyporus** spp.;  
**Schizophyllum commune**, cosmopolitan.

RUST. **Melampsora ableti-capraearum**  
(*M. epitea*) (II, III), general except far North;  
0, I on fir; **M. arctica** (II, III), AK, CO, NH;  
**M. epitea**, MN; **M. paradoxa** (*M. bigelowii*)  
(II, III), ME to NC, AK, IA, NM; 0, I on larch;  
**M. ribesii-purpureae** (II, III), MT to CO,  
AK, CA; 0, I on *Ribes*.

SCAB, Gray; Blight. **Fusicladium saliciperdum**  
(*Venturia chlorospora*), New England to NJ,  
NC, PA.

SOOTY MOLD. **Capnodium** sp.

SPOT ANTHRACNOSE; Scab. **Sphaceloma**  
**murrayae**, CA, OR, WA, WI.

Willow scab, followed by black canker, forms  
a very destructive blight, killing many trees in  
New England.

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### Winterberry (*Ilex verticillata*)

LEAF SPOT. **Physalospora ilicis**, NY.

LEAF SPOT, Tar. **Rhytisma concavum**, WI;  
**R. prini**, ME to MS, IL, WI.

POWDERY MILDEW. **Microsphaera alni**, WI.

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### Winter Cress (*Barbarea*)

BACTERIAL Black Rot. **Xanthomonas barbareae**,  
NY.

BACTERIAL, Yellows. **Spiroplasma citri**, IL.

DODDER. **Cuscuta gronovii**, NY.

DOWNY MILDEW. **Peronospora parasitica**, TX.

LEAF SPOT. **Cercospora barbarea**, WI;  
**Ramularia barbareae**, MA to NJ, OH, TX,  
WI; **Alternaria** sp., PA.

ROT, Stem. **Sclerotium rolfsii**, TX.

VIRUS. **Beet Curly Top; Potato Yellow Dwarf**.

WHITE RUST. **Albugo candida**, CA, TX.

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### Wintergreen, Checkerberry (*Gaultheria procumbens*)

ANTHRACNOSE. **Colletotrichum gloeosporioides**,  
British Columbia, Canada.

BLOTCH, Sooty. **Gloeodes pomigena**, WI.

FRUIT SPOT, Black Speck. **Leptothyrium pomi**,  
WI.

LEAF SPOT. **Cercospora gaultheriae**, NY, WI;  
**Pezizella oenotherae**, VA; **Discosia**  
**maculicola**, secondary; **Mycosphaerella**  
**gaultheriae**, ME to MD, WV; **Phyllosticta**  
**gaultheriae**, general; **Schizothyrium**  
**gaultheriae**, ME to VA, WI; **Venturia**  
**arctostaphyli**, MD, MA, NJ, NY, VA.

POWDERY MILDEW. **Microsphaera alni**, WI.

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### Wintergreen, Waxflower

► Pipsissewa.

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### Wisteria (*Wistaria*)

BACTERIAL Crown Gall. **Agrobacterium**  
**tumefaciens**, CT, MD, TX.

CANKER, Stem. **Nectria cinnabarina**, CT.

LEAF SPOT. **Phyllosticta wistariae**, MA, MO, NJ,  
TX; **Septoria wistariae**, TX.

NEMATODE, Root Knot. **Meloidogyne** spp.

POWDERY MILDEW. **Golovinomyces**  
**cichoracearum**, TX.

ROT, Heart. **Pleurotus** sp., WV.

ROT, Root. **Phymatotrichum omnivorum**, TX.

VIRUS. **Wisteria Vein Mosaic**, MS, NY, TX;  
**Tobacco Mosaic**, RI.

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### Witch-Hazel (*Hamamelis*)

BACTERIAL Crown Gall. **Agrobacterium**  
**tumefaciens**, MD.

LEAF SPOT. **Discosia artocreas**, OK;  
**Gonatobotryum maculicola**, NH to WV,  
FL, WI; **Graphium hamamelidis**, NY to IN,  
TN; **Monochaetia desmazierii**, VA to GA,  
TN; **Mycosphaerella** sp., WV; **Phyllosticta**  
**hamamelidis**, CT to MS, TN, WI; **Ramularia**  
**hamamelidis**, NY to WV, OK, WI.

POWDERY MILDEW. *Phyllactinia corylea*, MI, WI;  
*Podosphaera biuncinata*, New England to IL  
and southward.

ROT, Wood. *Fomes scutellatus*, widespread;  
*Polyporus* spp.

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### Wolfberry (*Symphoricarpos occidentalis*)

BLACK KNOT. *Dibotryon symphoricarpi*, twig  
canker, ND.

LEAF SPOT. *Cercospora symphoricarpi*, MT, ND,  
WA; *Septoria symphoricarpi*, IA, MT, ND,  
WA.

POWDERY MILDEW. *Microsphaera diffusa*,  
general.

ROT, Collar. *Fomes ribis*, KS, ND.

RUST. *Puccinia crandallii* (0, I), CO, MT, ND,  
WY; II, III on grasses; *P. symphoricarpi*, MT.

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### Wood-Betony, Lousewort (*Pedicularis*)

GALL, Leaf. *Synchytrium aureum*, WI.

LEAF SPOT. *Ramularia obducens*, CA; *Septoria  
cylindrospora*, WI.

POWDERY MILDEW. *Sphaerotheca macularis*,  
CA, CO, MD, MI, MN, WY, WI.

RUST. *Cronartium coleosporioides* (II, III), CA,  
ID, MT, NM, WA; *Puccinia clintonii* (III),  
CO, ID, ME, MI, NM, NY, OR, WA, WI, WY;  
*P. rufescens* (I, III), CA, CO, NV.

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### Wood Rose (*Rosa gymnocarpa, R. californica*)

LEAF SPOT, Lesions. *Phytophthora  
gymnocarpa*, CA.

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### Woodrush (*Luzula*)

RUST. *Puccinia obscura* (II, III), ME to KS, ID,  
OR, WA, WI.

SMUT. Inflorescence. *Cintractia luzulae*, IN.

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### Wyethia

LEAF SPOT. *Didymaria conferta*, OR, UT;  
*Marssonina wyethiae*, CA, WA; *Septoria  
wyethiae*, CA, UT.

NEMATODE, Leaf Gall. *Tylenchus  
balsamophilus*, UT.

RUST. *Puccinia balsamorhizae* (0, I, II, III), AZ,  
CA, CO, UT.

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### Xanthosoma

ROT, Root. *Armillaria mellea*, CA; *Fusarium  
solani*, powdery gray rot, FL.

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### Xerophyllum (Turkeybeard)

RUST. *Puccinia atropuncta* (II, III), MS.

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### Yam, Cinnamon-Vine (*Dioscorea*)

LEAF SPOT. *Cercospora dioscoreae*, IL, IA, MD,  
MI, PA, WI; *Colletotrichum dioscoreae*, IL;  
*Phyllosticta dioscoreae*, SC, VA, WV;  
*Ramularia dioscoreae*, WI.

NEMATODE, Root Knot. *Meloidogyne* sp., NC.

ROT, Root. *Phymatotrichum omnivorum*,  
TX.

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### Yarrow (*Achillea*)

BACTERIAL Crown Gall. *Agrobacterium  
tumefaciens*, IN.

DODDER. *Cuscuta* sp., NH.

NEMATODE, Root Knot. *Meloidogyne* sp., OR.

POWDERY MILDEW. *Golovinomyces  
cichoracearum*, AK, MO, MT, PA, SD, VT,  
WI.

ROT, Root. *Phymatotrichum omnivorum*, TX;  
*Rhizoctonia solani*, general.

RUST. *Puccinia millefolii* (III), CA, CO, ID, MT,  
NM, OR, UT, WA, WY.

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**Yaupon (*Ilex vomitoria*)**

LEAF SPOT; Tar Spot. *Rhytisma ilicincola*, VA.  
 ROT, Root. *Phymatotrichum omnivorum*, TX.  
 SOOTY MOLD. *Capnodium* spp., Gulf states.

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**Yellow-Root (*Xanthorhiza*)**

LEAF SPOT. *Phyllosticta xanthorhizae*, NC, WV.

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**Yellowwood (*Cladrastris*)**

POWDERY MILDEW. *Phyllactinia corylea*, OK.  
 ROT, Wood. *Polyporus spraguei*, MD.  
 VIRUS. **Bean Yellow Mosaic**, NY.  
 WILT. *Verticillium albo-atrum*, IL.

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**Yerba Buena (*Micromeria*)**

RUST. *Puccinia menthae* (0, I, II, III), CA, ID,  
 OR, WA.

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**Yerba Santa (*Eriodictyon*)**

BLOTCH, Sooty. *Coniothecium eriodictyonis*, CA.

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**Yew (*Taxus*)**

BLIGHT, Needle. *Herpotrichia nigra*, ID;  
*Sphaerulina taxi*, CA, ID, OR, WA;  
*S. taxicola*, also twig blight, NY, PA;  
*Alternaria* sp., CT, NY, RI; *Phyllosticta taxi*, VA;  
*Macrophoma taxi*; *Mycosphaerella taxi*; *Neopeckia coulteri*;  
*Cryptocline taxicola*, eastern United States.  
 BLIGHT, Ramorum. *Phytophthora ramorum*, PA.  
 BLIGHT, Seedling. *Phytophthora cinnamomi*, IN, MD, VA, Pacific Northwest.

BLIGHT, Twig. *Phyllostictina hysterella* (*Physalospora gregaria*); *Pestuloria* sp., PA;  
*P. funerea*, MA; *Sphaeropsis* sp. NJ;  
*Botryosphaeria ribis*.

DAMPING-OFF. *Rhizoctonia solani*, CT.

ROT, Heart. *Fomes hartigii* OR; *F. roseus*, ID.  
 ROT, Root. *Armillaria mellea*, ID;  
*Phytophthora cinnamomi*, OH; *P. lateralis*, CA.

ROT, Wood. *Polyporus schweinitzii*, ID.

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**Yucca (Adams-Needle, Joshua-Tree, Spanish Bayonet)**

BLIGHT, Flower. *Cercospora floricola* (*C concentrica*), TX.

BLIGHT, Leaf. *Kellermannia anomala*, secondary, general.

LEAF SPOT, *Cercospora concentrica*, CT, GA, IA, NJ, OK, TX; *Coniothyrium concentricum*, general; *Cylindrosporium angustifolium*, KS, MS, OK, TX; *Diplodia circinans*, TX; *Epicoccum asterinum*, TX; *Gloeosporium yuccogenum*, MO, TX; *Neottiospora yuccifolia*, GA, WA; *Pestalozziella yuccae*, secondary, TX; *Phyllosticta* sp., TX; *Stagonospora gigantea*, CA; *Leptosphaeria obtusipora*.

MOLD, Leaf. *Torula maculans*, AZ, CA, SC, TX;  
*Alternaria tenuis*, leaf rot.

NEMATODE. *Meloidogyne* sp., OR.

PHYTOPLASMA. *Yucca Phyllody Bud Proliferation*; **Aster Yellows**, TX.

ROT, Stem. *Sclerotium rolfsii*, MD.

RUST. *Puccinia amphigena* (0, I), NE.

Many other fungi are found on dead leaves and stems.

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**Zamia (Coontie)**

ALGAE. *Anabaena cycadeae*, in coralloid roots, FL.

NEMATODE. *Meloidogyne* sp., FL.

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### Zauschneria (Fire-Chalice, California Fuchsia)

RUST. *Puccinia oenotherae* (0, I, II, III), CA, UT.

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### Zebra Plant (*Aphelandra*)

LEAF SPOT. *Myrothecium roridum*, FL.

NONPARASITIC. **Physiological.** Leaf Crinkle; Shortened Internodes, Axillary Bud Proliferation, TX.

ROT, STEM. *Phytophthora parasitica*, FL.

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### Zephyranthes (Atamasco-Lily, Zephyr-Lily)

LEAF SCORCH; Red Spot. *Stagonospora curtisii*, CA.

LEAF SPOT. *Colletotrichum lilicearum*, NC.

ROT, Dry; Scale Speck. *Sclerotium* sp., OR.

RUST. *Puccinia cooperiae* (0, I, II, III), AL, FL, NC, TX.

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### Zigadenus

RUST. *Puccinia atropuncta* (II, III), IA, MO, ND, TX, WI; 0, I on composites; *P. grumosa* (0, I, II, III), CO, MT, WY; *Uromyces zygadeni* (0, I, II, III), CA, CO IA, KS, MT, NV, TX, UT, WA, WY.

SMUT, Leaf. *Urocystis flowersii*, UT.

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### Zinnia

BACTERIAL; Leaf Spot, Flower Spot. *Xanthomonas campestris* pv. *zinniae*, LA.

BACTERIAL, MLO. Aster Yellows, MI, PA, and California Aster Yellows, CA.

BACTERIAL Wilt. *Pseudomonas solanacearum*, FL.

BLIGHT. *Alternaria zinniae*, CO, CT, NJ, NY, PA, SC.

BLIGHT, Flower. *Alternaria alternata*, TX.

BLIGHT, Head; Stem Canker. *Botrytis cinerea*, CA, CT, NJ, OR, PA.

BLIGHT, Southern. *Sclerotium rolfsii*, FL, NJ.

DAMPING-OFF; Root Rot. *Rhizoctonia solani*, CA, NJ, TX.

LEAF SPOT. *Cercospora zinniae*, SC to FL, CO, IN, PA, TX.

LEAF SPOT, Bacterial. *Xanthomonas nigromaculans* f. sp. *zinniae*, NC, OH.

NEMATODE, Leaf. *Aphelenchoides ritzemabosi*, DE, MA, NJ.

NEMATODE, Lesion. *Pratylenchus nannus*, MD; *P. penetrans*, NJ.

NEMATODE, Root Knot. *Meloidogyne* sp., NJ, PA, TX.

POWDERY MILDEW. *Golovinomyces cichoracearum*, general.

ROT, Blossom. *Choanephora* sp., FL.

ROT, Charcoal. *Macrophomina phaseoli*, TX.

ROT, Root. *Phymatotrichum omnivorum*, TX.

ROT, Stem; Wilt. *Fusarium* sp., CO, IA, MO, NY; *Phytophthora cryptogea*, NJ; *Sclerotinia sclerotiorum*, CA, CO, MA, MT, OR, PA, WA.

VIRUS. Cucumber Mosaic; Beet Curly Top; Tobacco Etch, FL; Tomato Spotted Wilt; Bidens Mottle, FL; Potato Leafroll, Pacific Northwest; Sunflower Mosaic, TX.

Powdery mildew in late summer is the most common zinnia disease.

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### Zizia (Meadow Parsnip)

GALL, Leaf. *Urophlyctis (Physoderma) pluriannulata*, IA, WI.

LEAF SPOT. *Ascochyta thaspii*, WI; *Cercospora ziziae*, PA, WI; *Cylindrosporium ziziae*, ND, WA, WI; *Septoria ziziae*, ND.

POWDERY MILDEW. *Erysiphe polygoni*, PA, WV.

RUST. *Puccinia ziziae* (III), WA.

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**Zoysia (Japanese Lawn Grass)**

BLIGHT, Foliar. *Curvularia lunata*, NC.

DEAD SPOT, Spring. *Ophiosphaerella korrae*, NC.

LEAF YELLOWING, Root Mass Reduction. *Gaeumannomyces graminis* var. *graminis*.

NEMATODE, Pseudo Root Knot. *Hypsoperine graminis*, MD.

ROT, Root and Crown. *Rhizoctonia solani*, MD; *Helminthosporium tetramera*; *Curvularia* spp.; *Fusarium* spp; *Gaeumannomyces graminis* var. *graminis*, TX.

RUST. *Puccinia zoysiae*, AL, AR, FL, GA, LA, MD, MO, MS, TX.