
Fungicides

Azoxystrobin

Abound, Amistar, Bankit, Heritag, Ortiva, Priori, Quadris

Systemic fungicide for control of foliar and soil borne diseases.

Bacillus subtilis

Serenade, Subtilex, Taego, Companion, Kodiak

Used as a seed treatment to suppress *Rhizoctonia* and *Fusarium* diseases.

Benalaxyl

Galben, Tairel

Systemic fungicide.

Bitertanol

Bacseal, Baycor, Baycoral, Baymat, Zaron

Fungicide.

Bordeaux Mixture

Comac

Bordeaux mixture is made in varying concentrations. The most usual formula is 8-8-100 (often stated as 4-4-50), which means 8 pounds copper sulfate, 8 pounds hydrated lime to 100 gallons

of water. Stock solutions are made up for each chemical (1 pound per gallon of water), the lime solution placed first in the sprayer, diluted to nearly the full amount, and the copper sulfate solution added. Or, for power sprayers, finely divided copper sulfate can be washed through the strainer into the spray tank, and when the tank is two-thirds full the weighed amount of hydrated lime can also be washed through the strainer while the agitator is running. Casein or other spreader is added toward the end. Phytotoxicity comes from both the lime and the copper. Plants are often stunted, with yield reduced; fruit-setting of tomatoes may be delayed. Bordeaux is not safe on peaches during the growing season, may burn and russet apples (both foliage and fruits), may cause red spotting, yellowing, and dropping of rose leaves (often confused with blackspot by amateur and sometimes professional gardeners), and may cause defoliation of Japanese plums. Injury is most prominent early in the season when temperature is below 50 °F and in dull, cloudy weather when light rain or high humidity prevents rapid drying of the spray. Late summer use of bordeaux is credited with making some plants more susceptible to early fall frosts. For ornamentals, a 4-4-100 mixture is usually strong enough and can be made in small amounts by dissolving 2 ounces of copper sulfate in 1 gallon of water, 2 ounces of hydrated lime in 2 gallons of water, pouring the copper sulfate solution into the lime water, and straining into the spray tank through fine cheesecloth. For some plants, such as stone fruits, the proportion of lime is increased;

for others, such as azaleas, a low-lime bordeaux is used. Once the two solutions have been mixed, the preparation must be used immediately. Fresh lime is essential, not some left over from a previous season. Somewhat less effective than homemade bordeaux but easier for the home gardener are the various powders and pastes available under trade names; to these add only water at the time of use.

Bupirimate

Nimrod
Systemic fungicide.

Burgundy Mix

A soda bordeaux formerly used, prepared with washing soda instead of lime.

Burkholderia cepacia

Fungicide, nematocide.

Captan

Captan 30 DD, Captan 400
Protectant, eradicant fungicide.

Carbendazim

Bavistin, Decrosol
Systemic fungicide.

Carbon Disulfide

Soil fumigant.

Carboxin

Vitavax
Fungicide, seed protectant.

Chloranil

Foliar fungicide and seed treatment.

Chloroneb

Terraneb, N-Flow D, Proturf
Fungicide.

Chloropicrin

Chloro-O-Pic
Soil fumigant.

Chlorothalonil

Bravo, Bravo Ultrex, Bravo Weatherstik
Fungicide.

Copper Acetate

First developed in 1889; became the first factory made basic copper fungicide.

Copper Ammonium Carbonate

Copper-Count-N
Bactericide, Fungicide.

Copper Carbonate

Foliar fungicide, Seed treatments.

Copper Compounds

More stable than bordeaux mix, less phytotoxic, easier to use, and with less objectionable residue. Copper sprays control many blights, leaf spots, downy and powdery mildews. They are incompatible with lime sulfur, questionable with cryolite,

benzene hexachloride, tetraethyl pyrophosphate, organic mercuries, and thiocarbamates. They may injure plants in cool, cloudy or moist weather. Injury to apple and rose foliage varies from red-dish spots to yellowing and defoliation.

Copper Hydroxide

KOP Hydroxide
Fungicide, bactericide.

Copper Oxide

Chem Copp, Cuprocop, Cuprox, Caocobre, Cop-per Sandoz
Protective fungicide.

Copper Oxychloride

KOP Oxy-85, Recop, Coprantol, Cupramar, Cupravit
Protective fungicide.

Copper Sulfate

Tribasic (Flurane, Idrorame, King, Diachum)
Fungicide.

Cufraneb

Fungicide. Miticide, Seed Dressing.

Cycloheximide

Antibiotic fungicide from *Streptomyces griseus*, the first antibiotic introduced (1949) for control of plant disease.

Cymoxanil

Curzate
Fungicide.

Cyproconazole

Alto, Ateni, Sentinel
Systemic and eradivative fungicide.

Cyprodinil

Chieftain, Chorus, Unix, Vanguard
Fungicide, seed treatment.

Dazomet

Basimid
Soil fumigant.

Dichlofluanid

Elvaron, Euparen
Fungicide.

Dicloran

Allisan, Botran, Clortran
Fungicide.

Difenoconazole

Bardos, Bogard, Dividend, Geyser, Score, Sico
Systemic fungicide.

Dimethirimol

Milcurb
Systemic fungicide.

Dimethomorph

Acrobat, Forum
Oomycete fungicide.

Diniconazole

Mitazole
Systemic fungicide.

Dithianon

Delan
Fungicide.

Dodemorph Acetate

Meltatox
Fungicide.

Edifenphos

Hinosan
Fungicide.

Epoxiconazole

Opal, Opus
Systemic fungicide.

Etridiazole

Terrazole, Koban, Truban
Soil fungicide.

Fenaminosulf

Protects germinating seeds and seedlings in corn, beans, peas, spinach, cucumbers, and ornamentals.

Fenarimol

Used for powdery mildew and rust on ornamentals, turf, and tree crops.

Fenbuconazole

Enable, Govern, Indar
Systemic fungicide.

Fenpiclonil

Beret, Electer, Gambit

Fenpropidin

Mildin, Patrol, Sorilan, Tern
Systemic fungicide.

Fenpropimorph

Corbel
Systemic fungicide.

Ferbam

Ferman Granuflo
Fungicide.

Filipin

Antibiotic. Fungicide for seed-rot fungi.

Fluazinam

Omega
Fungicide, Miticide.

Fludioxonil

Celest, Geoxe, Maxim, Medallion, Sapphire, Savior, Scholar
Contact fungicide.

Flusilazole

Fungicide.

Flutolanil

Folistar, Moncut, Prostar
Systemic fungicide.

Folpet

Folpet
Protective fungicide.

Fosetyl-Aluminum

Aliette, Chipco
Systemic fungicide, bactericide.

Hexaconazole

Anvil, Planete Aster
Fungicide.

Hydrated Lime and Copper Sulfate

Bordeaux Mix

Prepared from copper sulfate and lime to form a membranous coating over plant parts, the first protective spray and still widely used. About 1878, French vineyard were threatened with downy mildew, which had been introduced from the U.S. Millardet, one of the workers assigned to the problem, noticed that where grapes near the highways to Bordeaux had been treated with a poisonous-looking mixture of copper and lime to prevent stealing, there was little or no downy mildew. A description of the preparation of bordeaux mixture was published in 1885, and it remains a most efficient fungicide. It does, however, have a most conspicuous residue and is injurious to some plants.

Hydroxyquinoline Sulfate

Chinosol
Systemic fungicide, bactericide.

Imazalil

Bromazil, Deccoziol, Double R11, Flo Pro IMZ, Freshgard 700, Impala, Nu-Zone
Systemic fungicide.

Iprodione

Chipco, Kodan, Rovral, ProTurf, Fungicide X
Contact/locally systemic fungicide.

Kresoxim-Methyl

Alliage, Candit, Cygnus, Discus, Sovran, Strobry
Surface systemic fungicide; protective and curative effects.

Lime Sulfur

Polysulfides formed by boiling together sulfur and mild of lime. The standard liquid has a specific gravity of 32 Baume and the commercial product is far superior to the homemade. Lime sulfur dates back to 1851, when the head gardener, Grison, at Versailles, France, boiled together sulfur and lime for a vegetable fungicide called "Eau Grison." In 1886, this fungicide was used in California as a dormant spray for San Jose scale and later for peach leaf curl. A self-boiled lime sulfur made without heat was produced in 1908 as a summer spray for sensitive plants, but it was later replaced by wettable sulfurs for most fruit-spray programs. A dry form of lime sulfur was marketed about 1908. Used as a dormant spray for fruits, roses, and some other plants for mildews, *Volutella* blight of boxwood, and other diseases. Do not use above 85 °F.

Mancozeb

AgriSolutions, Mancozeb, Penncozeb, Pennfluid, Tridex, Trimanin, Trimanoc, Trimanzone, Triziman, Triziman D, Vandozeb, Protect T/O, Mancozin, Manzin, Dithane, Fore, Manzate, Pentathlon DF, Pentathlon LF
Fungicide.

Maneb

Trimangol, Vondac, M, Manex, Manox, Man-Zox, Pentathon, Maneb Spritzpulver, Manex, Manzi
Fungicide.

Metalaxyl

Metax, Allegiance, ProTurf Soil and foliar fungicide; seed dressing fungicide.

Metalaxyl M

Quell, Apron XL, Ridomil Gold, Subdue 2X, Subdue MAXX
Fungicide.

Metam-Sodium

Metam 426, Polefume, Turfcure, Vapam, Vapam HL, Busan 1236, Trimaton, Sectagon 42, Metam CLR Soil fumigant –fungicide, insecticide, nematocide.

Metiram

Polyram
Contact fungicide.

Myclobutanil

Eagle, Nova, Rally, Systhane
Fungicide.

Nitrothal-Isopropyl

Pallitop
Fungicide.

Oxadixyl

Recoil, Ripost, Sandofan, Wakil
Systemic fungicide.

Oxycarboxin

Plantvax
Systemic fungicide.

Quintozene

Blocker, Parflo, Winflo, Defend, Terraclor, Turfcide, FF11, Penstar, RTU, PCNB
Soil fungicide; seed dressing agent.

Penconazole

Omnex, Topas
Systemic fungicide.

Pencycuron

Monceran, Trotis

Piperalin

Pipron
Fungicide.

Potassium Bicarbonate

Armicarb, GreenCure, Milstop Broad spectrum fungicide; K bicarbonate plus surfactants.

Potassium Bicarbonate

Kaligreen

Fungicide; K bicarbonate, no surfactants.

Prochloraz

Abavit, Ascurit, Oczave, Omega, Prelude, Sporgon, Sportak

Fungicide.

Propamocarb

Hydrochloride (Banol, Dynone, Filex, Prevex, Previcar, Previcur N, Win)

Fungicide.

Propiconazole

PropiMaX, Alamo, Banner, Break, Orbit, Tilt, Propizole

Systemic fungicide; seed treatment.

Propineb

Antracol, Inicol

Contact fungicide.

Pyrifenox

Corona, Dorado

Systemic fungicide.

Pyroquilon

Coratop, Fongorene

Systemic fungicide.

Pyrazophos

Afugan, Curamil

Systemic fungicide.

Quarternary Ammonium Compounds

Barquat, Hyamine

Fungicide, Bactericides, Surfactants.

Sulfur

Kumulus, CSC Dusting, CSC Thioben, CSC Thiosperse, Crisazufre, Sulfox, Suffa, Sulfa, Red Ball, Microsulf, Thiolum, Thiovit, Bensul, Golden Demo Signal, Special Electric, Comoran, Comoran Supra, Cosan, Elosal, Kolodust, Kumulus, Microspere

Fungicide, Miticide.

Tebuconazole

Corail, Elite, Folicur, Horizon, Horizon Arbo, Horizon T, Lyux, Raxil

Systemic fungicide.

Tetraconazole

Eminent

Systemic fungicide.

Thiabendazole

Arbotect, Mertect, Storite, Storite Excel, Tectab, Tecto, APL-Luster, APL Luster T, Decco 205, Brogdex, Freshgard 598, Gustafson SP

Systemic fungicide.

Thiophanate Methyl

Domain, Fungo, Mildothane, Topsin M, 3336, Fansin-M, OHP 6672

Fungicide.

Thiophanate Methyl Plus Etridiazole

Banrot Soil fungicide.

Thiram

Tripomol, Defiant, Thiram Granuflo, Aatack, Aules, Chipco, Thiram 75, Pomarsol, Forte, Thiulin,
42-S Thiram, Rhodiasan Express, Spotrete
Fungicide, Seed protectant.

Triadimefon

Bayleton, Strike
Systemic fungicide.

Triadimenol

Bayton, Bayfidan, Cereous, Trisan, Bayton 30
Systemic fungicide.

Trichoderma Harzianum

Plant Shield, Root Shield, Top Shield
Foliar, Soil fungicide.

Tricyclazole

Blast
Systemic fungicide.

Tridemorph

Calixin
System fungicide.

Trifloxystrobin

Compass, Flint, Gem, Twist, Compass O
Fungicide.

Triflumizole

Procure, Terraguard
Systemic fungicide.

Triforine

Denarin, Funginex, Saprol
Fungicide.

Triphenyltin Hydroxide

Brestanid, Agri Tin Fungicide.

Vinclozolin

Ronilan, Curalan, Vorlan
Fungicide.

Zineb

Cuprothex, Super Mixy
Fungicide.

Ziram

Tricarbamix, Triscabol, Cuman, Pomarsol 2
Fungicide.