

Chapter 9

Disease Appraisal Scales

9.1 Disease Appraisal Scales

The evaluation of disease severity is necessary, especially for epidemiological experiments as well as for measuring the level of resistance. Several scales are proposed for different diseases but none of them is suitable for all the diseases. Use of specific scales are necessary for leaf blight fungi, powdery mildew (Fig. 9.1), rusts (Fig. 9.2), for some spike diseases (Fig. 9.3) and for hemilthosporium (Fig. 9.4).

Rogenski et al. (2012) suggested application of artificial neural networks to estimate infection by leaf spot in wheat crop. These authors proposed a system based in artificial neural networks in order to estimate the percentage of infections of diseases, assisting in decision making and facilitating the monitoring of potentially infected areas. However, the system needs to be validated under different wheat growing conditions.

In the following pages, some diagrammatic scales are presented to aid the reader in disease appraisal and its interpretation. Normally, disease ratings should be made 3–4 times during the crop cycle to plot the progress of the disease epidemic. For further details the reader may refer to specific publications in this respect (Chester 1950; Browder 1971; James 1971a, b; Roelfs 1992).

Fig. 9.1 Disease appraisal scale for powdery mildew.
Source: Mehta (1993)

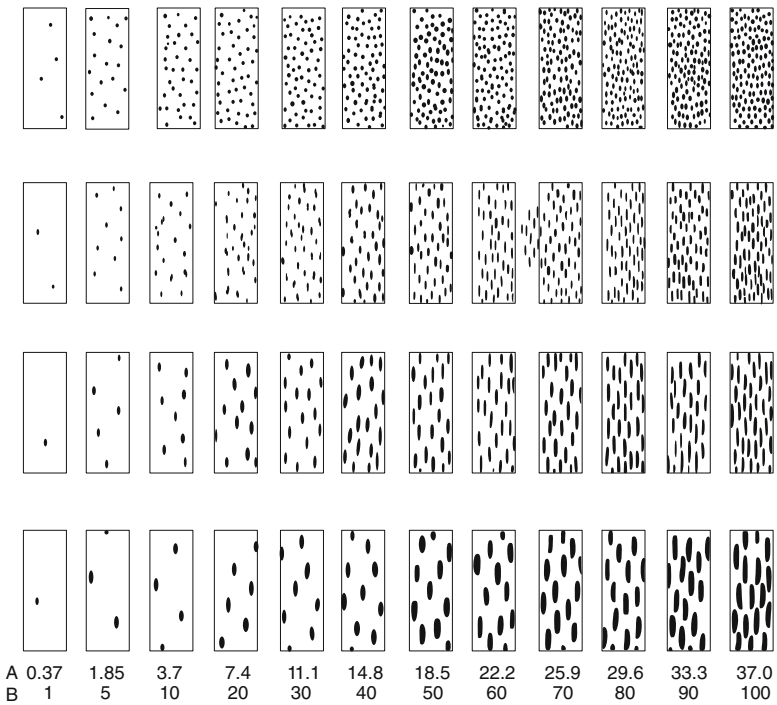


Fig. 9.2 Disease appraisal scale for rusts the modified Cobb scale (A) actual percentage occupied by rust uredinia; (B) rust severities of the modified Cobb scale. *Source:* after Peterson et al. (1948), Roelfs (1992)

Fig. 9.3 Disease appraisal scale for scab-the fusarium head blight (FHB). *Source:* James (1971a, b)

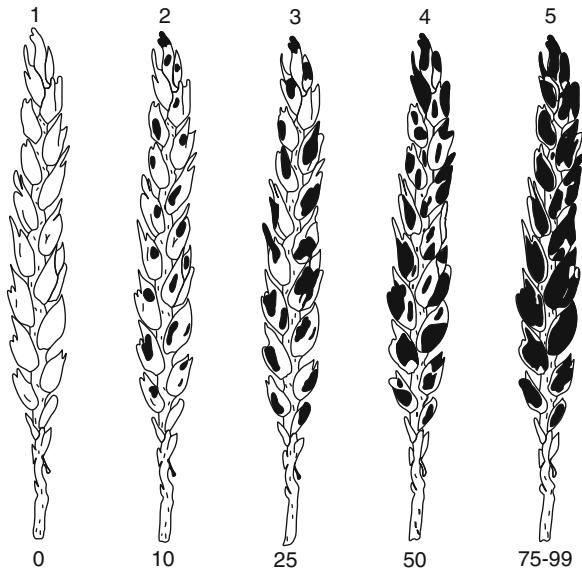
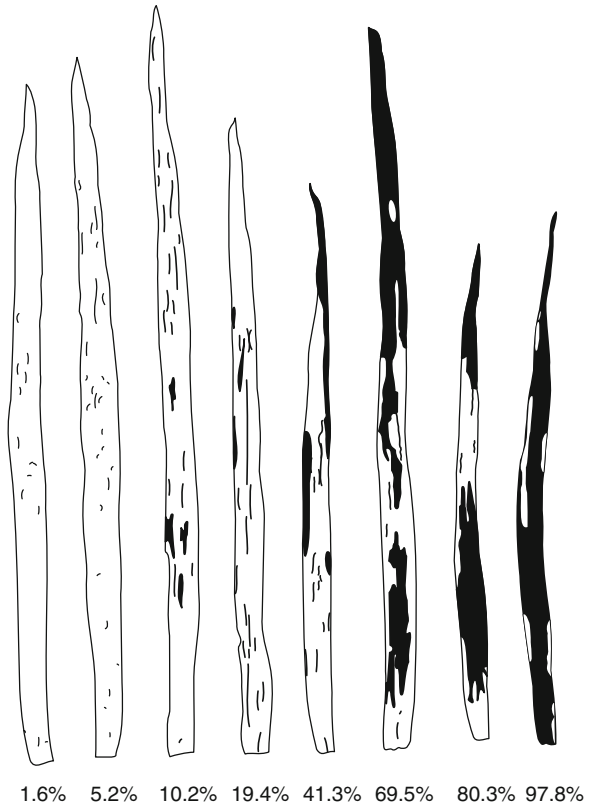


Fig. 9.4 Disease appraisal scale for *Helminthosporium* leaf blights



Selected References

- Browder LE (1971) A proposed system for coding infection types of the cereal rusts. *Plant Dis Repr* 55:319–322
- Chester KS (1950) Plant disease losses: their appraisal and interpretation. *Plant Dis Repr Suppl* 193:191–362
- James WC (1971a) A manual of assessment keys for plant diseases. Publication No, Canada Department of Agriculture, 1458
- James WC (1971b) An illustrated series of assessment keys for plant diseases. Their preparation and usage. *Can Plant Dis Surv* 51:39–65
- Jones DG, Cooke BM (1969) The epidemiology of *Septoria tritici* and *Septoria nodorum*. I. A tentative key for assessing *Septoria tritici* infections on wheat heads. *Trans Br Mycol Soc* 53:39–46
- Large EC (1966) Measuring plant diseases. *Annu Rev Phytopathol* 4:9–28
- Loegering WQ (1959) Method for recording cereal rusts data. USDA International spring wheat rust nursery (Cyclostyled)
- Peterson RF, Campbell AB, Hannah AE (1948) A diagrammatic scale for estimating rust intensity of leaves and stem of cereals. *Can J Res* 26:496–500
- Roelfs AP (1992) Rust diseases of wheat: Concepts and methods of disease management. CIMMYT, Mexico, D.F., 81 pp
- Rogenski RA, Zanlorensi LA, Mathias IM (2012) Aplicação de redes neurais artificiais para a estimativa de infecção por manchas foliares na cultura do trigo. *Revista de Engenharia e tecnologia* 4:58–64