BOOK REVIEW

Control of Crop Diseases, Third Edition


The authors in the Control of Crop Diseases cover a wide range of topics from crop diseases and their diagnosis and eradication to a primer on fungicides and legislation. This wide range of topics, all critical areas relative to crop diseases, thus appeals to a wide audience from molecular biologists to plant pathologists to plant breeders. The book should be a beneficial text for graduate students of plant biology.

After the introduction, the authors (Chapter 2) begin with the major crop diseases in the United Kingdom (UK). Although it is likely that many readers may not be located in the UK, the discussion of diseases that affect cereals, oil seed crops, potatoes, sugar beets, legumes, apples, pears, and greenhouse-grown crops will be applicable, as many of these crops are grown outside of the UK. The authors discuss the diagnosis of diseases in crops (Chapter 3) from visual symptoms (of which there are 24 color photographs placed in the fungicide chapter showing the effects of diseases on various plant species), by inducing sporulation or other laboratory techniques, and by the use of enzyme-linked immunosorbant assay (ELISA) and DNA-based techniques for pathogen identification. The discussion of the analysis of genome structure is outdated and could be revised to cover the new sequencing technologies. Chapter 4 focuses on the eradication of pathogens, eradication of soil, and the eradication of seed. The eradication of soil pathogens may be completed by steaming or the application of chemical sterilants, such as dazomet. For greenhouse pathogen eradication, hosing down the greenhouse with disinfectant, and all growing materials, such as pots and trays, can be soaked with disinfectant. Because many plant pathogens are infected by vectors such as aphids, insecticide use is suggested. To control disease on seed, treatment of seeds with an appropriate fungicide or hot water is suggested. The authors mention that vegetatively propagated crops are prone to viral diseases (Chapter 2). Elimination of these viruses in vegetatively propagated crops can be achieved by meristem-tip culture accompanied by heat treatment. Certification schemes are discussed for seed potatoes, strawberries, raspberries, and top fruit. Although these procedures and legislative bodies are specific for the UK, the schemes described can be used worldwide.

The authors discuss techniques of crop husbandry (Chapter 5) to reduce diseases through crop rotation, soil sterilization, sowing at recommended rates and approximate depth, modifying lime and fertilizer applications, and killing the vegetative parts of some crops (potato) before harvest. Chapter 6 covers the production of cultivars resistant to plant diseases to reduce chemical applications and ease husbandry procedures. The authors also cover the preservation of germplasm of wild relatives of crop plants that may contain resistance genes and warn that resistance based on one or a few genes may not be long-lasting. The chapter describes how new resistant cultivars have often been created by pedigree method, backcrossing, and mutation breeding.

The strongest part of the book is the discussion of fungicides (Chapter 7), of which the information is well-organized and current. The book review is published in Crop Sci 53:732–733 (2013). doi: 10.2135/cropsci2012.12.0006
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