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BOOK REVIEW

BURDON, J. J.: DISEASES AND PLANT POPULATION BIOLOGY. — Cambridge University Press, Cambridge—London—New York—New Rochelle—Melbourne—Sydney 1987. 208 pp. H/c £ 27.50, US $ 49.50; P/b £ 12.50, US $ 19.95.

This book is devoted to the effects of pathogens on the population biology of their hosts. It is based on principles of ecology, genetics and plant pathology. This interdisciplinary approach makes the book particularly valuable. Another unconventional quality of the book consists in generalization of the effects of diseases on populations of wild, as well as agricultural plants. As the author states he tried to provide some insight into the relevance of host pathogen interactions for diversity theory, for considerations of the maintenance of polymorphisms in plant populations, and for the occurrence of co-evolutionary interactions in nature. Primarily, he had non-agricultural populations in mind, but the scarcity of data concerning wild plants led him to base the book on results obtained by epidemiological studies of agricultural plants and apply them on wild plant populations.

Chapter 1 deals with pathogens and the population biology of plants. Chapter 2 is devoted to the effects of pathogens on individual plants. By killing or weakening individual plants pathogens affect the size and density of plant populations. Chapter 3 deals with epidemiologic aspects: the development of an epidemic and effect of plant populations on disease development. Vanderplank's analysis of epidemics is compared with analyses by other authors. Effect of mixed populations on disease occurrence and *vice versa* is described. Varietal mixtures or multilines become an important tool of practical plant protection particularly in cereal crops; data summarized in several chapters of the book present a good information on this topic. Chapter 4 deals with the genetic basis of disease resistance in plants, expression of disease resistance, active and passive disease resistance mechanisms, race specific- and race non-specific resistance, the genetic basis of pathogenicity and the gene-for-gene hypothesis. In Chapter 5 environmental modification of host-pathogen interactions, the effect of spatial distribution of disease and disease occurrence and expression within individual host stands are analyzed. Physical, nutritional and ontogenetic factors are discussed. Chapter 6 is devoted to the effect of pathogens on the size of plant populations and comprises theoretical models and empirical evidence. Chapter 7 describes the effect of pathogens on the genetic structure of plant populations, Chapter 8 the effect of host plants on the population genetic structure of pathogens; theoretical models are compared with empirical evidence. The last chapter presents suggestions for further study. A glossary of plant pathological terms mostly based on definitions published by the Commonwealth Mycological Institute (1968) and the Federation of British Plant Pathologists (1973) will be welcome by readers who are not familiar with the topic. Twenty pages of references comprise the most important and recent literature on the topic.

The book will be of great interest to students of biology and agronomy, as well as to research workers in plant pathology, plant disease epidemiology, population genetics and ecology and finally to plant breeders interested in breeding for disease resistance.

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