

Dhan Pal Singh and Arti Singh, Disease and Insect Resistance in Plants

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The book, as outlined by the authors in their Preface, provides a revised edition of Dhan Pal's 'Breeding for Resistance to Diseases and Insect-Pests' published by Springer-Verlag in 1986. There are eight chapters in this book including the value of disease and insect resistance and the basic concepts of resistance, genetics of the host-parasite interaction, methods of testing for resistance, breeding techniques, and stability and vulnerability of resistance. A basic knowledge of plant pathogens and pests and their genetics is assumed.

In the first introductory chapter, the impact of plant diseases and pests is illustrated by listing examples of devastating epidemics during the last 150 years. This brief chapter points out some considerations that should be taken into account for organizing a breeding programme.

In the following two chapters, several technical terms are described concerning variability of plant pathogens as well as different mechanisms of resistance and plant defence against pathogens and insect pests. Both chapters feature numerous examples and the authors focus mainly on topics

of interest for breeders. The chapter 'Concepts in Insect-Pest Resistance' presents detailed explanations of the genetics of plant-pest interactions with extensive tables. However, the comprehensive list of references covers mainly the years 1970 and 1980, and considering the rapidly developing research area of plant resistance, aspects regarding molecular and biochemical factors are conspicuously missing.

In Chapter 4, 'Genetics of Host-Parasite Interaction' the authors list numerous examples of plant-pathogen interactions describing the inheritance of resistance. All examples come from the field of classical plant breeding. Chapter 5 'Sources of Resistance and Methods of Testing for Resistance' is also intended for plant breeders. The reader will find a list of germplasm centres and lists of wild species used to transfer genes for disease resistance. Furthermore, the authors describe techniques for screening resistance to diseases and pests. However, recent methods using molecular technologies are again not mentioned.

Chapter 6, 'Breeding for Resistance to Diseases and Insects' embraces the methods of conventional breeding for resistance. In addition, the chapter deals with the management of horizontal and vertical resistance genes as well as disease tolerance.

Chapter 7 'Production of Disease-Resistant Plants by Unconventional Breeding' briefly pre-

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sents breeding methods using cell and tissue culture techniques and some DNA marker technologies. It is more a listing than a detailed representation of these techniques. The description of the polymerase chain reaction in a schematic diagram may remind readers of a molecular biology textbook for university students. In Chapter 8, the authors list factors that promote genetic vulnerability and they propose a solution for linking several factors to increase the stability of resistance.

Summing up, the book covers the principles and practices of conventional plant resistance breeding, and is suitable for use as an advanced text. However, it shows considerable weaknesses in all aspects of modern molecular-based themes. The book is intended mainly for advanced students and researchers of plant breeding, and for plant pathologists with interests in classical resistance breeding. With the extensive subject index—containing about 1500 references—the book will also be a useful source of published information.