

University of Nebraska - Lincoln

DigitalCommons@University of Nebraska - Lincoln

Great Plains Research: A Journal of Natural and
Social Sciences

Great Plains Studies, Center for

Fall 2001

**Review of *Insecticide Resistance: From Mechanisms to
Management* Edited by I. Denholm, J. A. Pickett, and A. L.
Devonshire**

Charles F. Chilcutt
Texas A&M University, Corpus Christi

Follow this and additional works at: <https://digitalcommons.unl.edu/greatplainsresearch>



Part of the [Other International and Area Studies Commons](#)

Chilcutt, Charles F., "Review of *Insecticide Resistance: From Mechanisms to Management* Edited by I. Denholm, J. A. Pickett, and A. L. Devonshire" (2001). *Great Plains Research: A Journal of Natural and Social Sciences*. 572.

<https://digitalcommons.unl.edu/greatplainsresearch/572>

This Article is brought to you for free and open access by the Great Plains Studies, Center for at DigitalCommons@University of Nebraska - Lincoln. It has been accepted for inclusion in Great Plains Research: A Journal of Natural and Social Sciences by an authorized administrator of DigitalCommons@University of Nebraska - Lincoln.

Insecticide Resistance: From Mechanisms to Management. Edited by I. Denholm, J. A. Pickett, and A. L. Devonshire. Wallingford, Oxfordshire, UK and New York: CABI Publishing, 1999. vi+123 pp. Figures, tables, references, notes, index. \$65.00 cloth (ISBN 0851993672).

When asked to review this volume, I feared it might be an overly long and involved textbook on pesticide resistance. Happily, the book is actually a collection of papers by some of the world's top resistance researchers. Written in scientific journal style, it contains fourteen concise, articulate, informative papers divided into two sections: "Genes and Mechanisms" and "Ecological Genetics and Management." The book is heavily geared toward resistance researchers, although geneticists, ecologists, and evolutionary biologists may also find it instructive. The general reader would be wise to start with papers in the second section, which offer longer introductions and more basic information on insecticide resistance than those of the first, written more for biochemists and geneticists.

A case study of insecticide resistance evolution in the peach-potato aphid opens the first section. The second paper, a review of insecticide target genes, discusses the possible reasons why there are so few resistance-associated mutations in these genes. A broader case study, the third paper discusses the roles of gene splicing, amplification, and gene expression in mosquito resistance to insecticides. The fourth, a review of cytochrome P450 monooxygenases (a major factor in metabolic resistance of insects), leaves the reader with several questions and hypotheses for further research in this area. Competition between resistance genes that arise in independent populations and come together through migration is the focus of the fifth paper, while the sixth, an excellent introduction to genomics, explains the value of DNA sequencing and its usefulness in resistance management in a way that general readers can understand. The section's final paper, a discussion of the process of invention and development of new insecticides, is also written in an informative, accessible style.

Section two begins with a paper that describes predicting the evolution of resistance mechanisms as a possible way of managing resistance to new insecticides, followed by a review of the status of insecticide resistance in two genera of moth pests (*Heliothis* and *Helicoverpa*). Next is a brief but informative look at the diversity of resistance mechanisms to Bt, the bacterium whose genes have been inserted into crops such as corn and potato, causing much of the worldwide controversy over genetic engineering. The volume's eleventh paper is a well-written, easily grasped discussion of the challenges of managing insecticide resistance in agricultural pests, followed in the next by an examination of methods to prevent the development of insecticide (pyrethroid) resistance in mosquitoes that transmit malaria. Paper thirteen focuses on the controversial possibility of managing resistance to Bt-genetically modified crops by introducing other insecticidal genes. In the final paper, a discussion of integrating resistance management strategies with pest control tactics, the author argues that we can't manage resistance, we can only mitigate it.

Insecticide Resistance is a valuable contribution to pesticide resistance research, although its appeal will probably be restricted to researchers in this field. **Charles F. Chilcutt**, *Department of Entomology, Texas A&M University Agricultural Research & Extension Center, Corpus Christi*.