

ENVIRONMENTAL PEST MANAGEMENT

CHALLENGES FOR AGRONOMISTS, ECOLOGISTS,
ECONOMISTS AND POLICYMAKERS

EDITED BY
MOSHE COLL • ERIC WAJNBERG

WILEY

A wide-ranging, interdisciplinary exploration of key topics that interrelate pest management, public health and the environment

This book takes a unique, multidimensional approach to addressing the complex issues surrounding pest management activities and their impacts on the environment and human health, and environmental effects on plant protection practices.

It features contributions by a distinguished group of authors from thirteen countries, representing an array of disciplines. They include plant protection scientists and officers, economists, agronomists, ecologists, environmental and public health scientists and government policymakers. Over the course of eighteen chapters, those experts share their insights into and analyses of an array of issues of vital concern to everyone with a professional interest in this important subject.

The adverse effects of pest control have become a subject of great concern worldwide, and researchers and enlightened policymakers have at last begun to appreciate the impact of environmental factors on our ability to manage pest populations. Moreover, while issues such as pesticide toxicity have dominated the global conversation about pest management, economic and societal considerations have been largely neglected. *Environmental Pest Management: Challenges for Agronomists, Ecologists, Economists and Policymakers* is the first work to provide in-depth coverage of all of these pressing issues between the covers of one book.

- Offers a unique multi-dimensional perspective on the complex issues surrounding pest management activities and their effect on the environment and human health
- Addresses growing concerns about specific pest management strategies, including the use of transgenic crops and biological controls
- Analyses the influence of global processes, such as climate change, biological invasions and shifts in consumer demand, and ecosystem services and disservices on pest suppression efforts
- Explores public health concerns regarding pesticide use, genetically-modified crops and food safety
- Identifies key economic drivers of pest suppression research, strategies and technologies
- Proposes new regulatory approaches to create sustainable and viable crop protection systems in the framework of agro-environmental schemes

Offering a timely and comprehensively unique treatment of pest management and its environmental impacts in a single, inter-disciplinary volume, this book is a valuable resource for scientists in an array of disciplines, as well as government officials and policymakers. Also, teachers of undergraduate and graduate level courses in a variety of fields are sure to find it a highly useful teaching resource.

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Preface

With the rapid growth of awareness and concern regarding adverse effects of pest management activities on human and environmental health, researchers and, to a lesser extent, policymakers have recently begun to appreciate these impacts as well as the influence of environmental factors on our ability to manage pest populations. In this respect, we were surprised to find that no single volume has as yet been devoted to these complex interactions. In addition, economic and societal considerations have been largely neglected while other topics, such as pesticide toxicity, have been the focus of much attention.

This volume is aimed at filling these gaps by addressing these pressing issues. It is designed to help develop and improve environmental pest management policies and agro-environmental schemes so that they encompass all major elements operating between pest management practices and the environment. It provides up-to-date fundamental information as well as recent research findings and current thinking on each topic so that complex issues are made available to readers across disciplines. It overviews major agronomic, ecological and human health aspects of pest management–environment interactions, discusses economic tools and caveats, and assesses shortcomings of various agro-environmental policies. Finally, taken together, it proposes a new framework for the development of effective, sustainable and environmentally compatible pest management programmes.

We believe that this timely treatment of the topic in a single, interdisciplinary volume will be of interest to an unusually wide readership. The book should be valuable for everyone interested in agriculture, ecology, entomology, pest control, public health, environmental economics and ecotoxicology, as well as policymakers worldwide. It will also be useful as a versatile teaching resource. Teachers of undergraduate and graduate courses in related fields will find the book useful as both a reference and background reading ahead of group discussions on controversial issues. Finally, we hope the book will promote interdisciplinary discussion and co-ordination between pest management stakeholders, conservation ecologists and environmentalist groups.

After a short introductory chapter (Chapter 1), the first part of the book provides general background to Integrated Pest Management (Chapter 2) and to pest management economics (Chapter 3). The second part addresses environmental concerns surrounding various pest management tactics, such as pesticide use (Chapter 4), biological control (Chapter 5) and the use of transgenic crops (Chapter 6). The third section discusses positive and negative ecosystem services provided by natural areas to influence pest management (Chapters 7 and 8, respectively). Then, the fourth section addresses

effects of global processes such as climate change (Chapter 9) and biological invasions (Chapter 10) on pest suppression. The fifth section covers the influence of pesticide use and the consumption of genetically modified foods on public health (Chapters 11 and 12, respectively). The sixth section then discusses policies related to pesticide use (Chapter 13), importation of biological control agents (Chapter 14), food safety (Chapter 15), externalizing economic drivers (Chapter 16) and agro-environmental schemes (Chapter 17). In the concluding chapter (Chapter 18), we summarize take-home messages and propose a new framework for future research, extension and legislative work.

We thank the following referees for their critical comments on the book's chapters: Nir Becker, Dale G. Bottrell, Ephraim Cohen, Antonio Cusumano, Georges de Sousa, Roy van Driesche, Peter Follett, Fred Gould, Isaac Ishaaya, Hagai Levine, Philippe Nicot, Yvan Rahbé, Helen Roy, Clement Tisdell, Linda Thomson, and Steve Wratten. However, all information, results, views and discussions are the sole responsibility of the respective authors. Finally, we express our sincere thanks to the people at Wiley for their efficient help and support in the production of this book.

November 2016

*Moshe Coll
Eric Wajnberg*

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