BOOK REVIEWS

New Books Received


Biodiversity and Pest Management in Agroecosystems


After decades of extensive agricultural activities, we now understand that biodiversity plays an important role in agroecosystems, and complex systems are more sustainable in terms of production and resource conservation than simple ones. Following this understanding, there is new interest in the structural design and management strategies of such complex systems. From this point of view, the two authors of this book have done an excellent job to meet this need by elucidating the structure of various integrated farming systems with an emphasis on biodiversity and its relationship with pest management.

The central message of this book is that biodiversity can contribute to the design of pest-stable agroecosystems. Long-term sustainable agroecosystems can be achieved by site-specific analysis (identifying key components among plants, herbivores, and natural enemies and desirable types of biodiversity), system structural design (choosing management strategies, e.g., cover crops), and best management practices (soil fertility, cultural management, etc. to enhance biodiversity).

The book is well organized into nine chapters with a separate introduction and conclusion. The first two chapters establish the ecological and biological principles as a basis for the case studies in later chapters. Starting with an in-depth analysis of the differences between traditional and modern agriculture models, the authors review the role of biodiversity in agroecosystems, characteristics of the agricultural habitat, crop diversification, pest buildup, and interactions with biological control. With such diverse topics in a complex system, I found the bulleted text and many figures provided by authors helpful for understanding the relationships and interactions.

Chapter 3 can be seen as a connection between the first and the second part of this book. In this chapter, the authors discuss several theories explaining the relationship between insect stability and plant diversity, including “monophagous/polyphagous pests,” “associated resistance,” the “natural-enemy hypothesis,” “resource concentration,” and crop “apparency.” Given the limitations of real situations, comparisons between major hypotheses and criticisms concerning theories also are discussed, which makes it one of the most appealing chapters of this book.

The second part of this book, Chapters 4 to 9, provides specific examples of biological and alternative pest management in different cropping systems using case studies. Chapters 4 to 7 examine the effects of weed management, multicropping, cover crops, and crop-field border vegetation, respectively, on pest population density and damage. Chapter 8 brings in the combinations of crops with trees, extending the type of biodiversity to agroforestry systems. Chapter 9 is relatively independent and focuses on principles involved in system design.

From resource-poor farms in Latin America to the powerful agrarian structure of California, the case studies used in these chapters are all different and site specific. But each represents certain underlying mechanisms and relationships among plants, herbivores, and natural enemies, which provide the keys to the successful designs. For researchers and biological control practitioners who are developing their own solutions, the successful cases in this book are especially encouraging and valuable.

I believe that it was the authors’ many years of hard work in the field that has made this book a success in providing more than 100 studies and covering numerous species of crops, weeds, pests, and natural enemies. A well-organized index makes searching for information about crops and pests an easy task.

The book can be used by researchers, entomologists, and extension agents to assist their research and educational activities. The book is a good place to start for graduate students or researchers entering the field of biological control and crop protection. It is also helpful for regulatory governmental agencies working on small-farm development to understand the importance of structural design. Also, I believe that the intensive literature and information assembled in this book will be useful for anyone interested in agroecosystems and biological pest control.

For farmers who would like to grow “green food” and make