BOOK REVIEWS


This textbook is targeted for an undergraduate audience, specifically, students enrolled in horticulture and plant science courses that are taken early in a student’s course of study. The primary emphasis is on environmental factors that affect both plant growth and commercial production. The author, Dennis R. Decoteau, is both professor and head of the Horticulture Department at The Pennsylvania State University. Both of his graduate degrees focused on environmental plant physiology, and he has previously published Vegetable Crops with Prentice Hall.

This book has four major sections. The first presents an overview of plant sciences and the second covers the basics of plant growth and development. Taken together, those two sections include a total of 86 pages. The third section focuses on the environmental factors affecting plant growth and includes 182 pages. The fourth section turns the reader's attention toward rhizosphere factors affecting plant growth, and consists of 102 pages.

Decoteau does a fine job of presenting detailed material regarding environmental factors influencing plant growth, whether he’s focusing on below- or above-ground factors. Perhaps the most important difficulty with this text is the decision on how to handle the introductory material. As the text stands, the introductory material (the first two sections) tends to be somewhat superficial and unsatisfying. The other alternative, simply informing readers that this content should be derived in a previous course from a different textbook, is more attractive to this reviewer. However, an instructor could supplement Decoteau’s text with additional materials on plant sciences and the basics of plant growth and development, and then focus on the environmental factors, using Decoteau’s text as the primary point of reference.

Although the first section presents only a modest coverage of plant sciences, it gives a reasonably good idea of how plant sciences fit into the global realities of food production. I was surprised to see a discussion of the various plant sciences (Chapter 4) that did not include plant biotechnology. In the second section, Chapter 6 does a fine job of drawing distinctions among C3, C4, and CAM photosynthetic types; in addition, detailed information is presented on glycolysis and the Krebs’ cycle. I found the next chapter on hormones to be somewhat misplaced, since it discussed management at some length but is placed in a section focused on plant growth and development. As a crop ecologist myself, I was surprised that Chapter 8 (ecology) was so short and primarily focused on definitions rather than concepts.

Part 3 starts with some editorial confusion. While Page 87 identifies Chapter 9 (introductory to all environmental factors) as the beginning of Part 3 and Page 95 identifies Chapter 10 (overview of aerial factors) as the beginning of Part 4, the table of contents does not identify a Part 4 but seems instead to imply that the separate sections on aerial and rhizosphere factors are subparts of Part 3. While not an overwhelming issue, it could cause some unnecessary confusion about the flow of the book.

I was surprised to see that Chapter 10, overview of aerial factors, does not mention mechanical disturbances, the 43 page Chapter 15 included in this section. Chapter 11 is probably the strongest single chapter in the text, doing an excellent job on the interaction of light intensity and the various photosynthetic pathways. Chapters 12 through 14 (temperature, atmospheric gases, and air pollutants) are well done and make solid contributions to this text. Chapter 15, on mechanical disturbances is very interesting, but has some information that seems relatively exotic; for example, is seismophoresis important to discuss?

Chapter 16 is an exceptionally well-written introduction to the rhizosphere section. Likewise, Chapters 17 to 19 (water, nutrients, and soil organisms) are well done, and clearly understandable. I am unsure whether allelochemicals merit an entire chapter (20).

Overall, this book does a good job of covering environmental factors that influence plant growth and development. Its usefulness in collegiate classrooms will, in my opinion, be enhanced by supplementing with additional materials on plant sciences and plant growth and development.

Larry J. Grabau
Department of Plant and Soil Sciences
University of Kentucky
N122F Ag. Science North
Lexington, KY 40546-0091
(lgrabau@uky.edu)

doi:10.2135/cropsci2005.0003br


Raw stored grains and stored processed food products are at risk from infestation and destruction by stored-product insects. With increasing urbanization in modern societies, an extensive distribution system converts raw commodities to bagged and packaged food, and delivers those products to consumers. The food industry is deeply concerned about the impact of stored-product insects on food quality and food safety, and strict control measures are required to prevent serious infestations. For control to be accomplished, insect species must be correctly identified, information about life history and biology must be taken into account, and pest status must be properly evaluated for the specific system for which control measures are adopted. Although there is considerable knowledge regarding stored-product insects, much of this information is in the scientific literature, which is often difficult to access. The author, David Rees, is an entomologist and researcher with CSIRO Entomology in Australia, and an authority on population biology and ecology of stored-product insects. He has written a general yet comprehensive publication detailing the economic importance, pest status, and ecology of the major pests of grain and durable products, which provides a starting point or entry level for a basic understanding of stored-product insects.

The introductory chapter, Insects as Pests of Stored Products, describes the origins and scope of stored-product insects and the impacts of infestation. Feeding strategies are presented and insects categorized as primary feeders, secondary feeders, detritivores, parasites, predators, and incidental pests. The impact of environmental conditions on insect population growth is also discussed, with special reference to temperature and relative humidity. This introduction concludes with a section on how to use the book. Information on insect species is presented in 25 sections, and in the Coleoptera and Lepido-
ptera, each section covers a family. Some sections are further divided into subsections covering a significant genus or species within that family. Information presented in the section includes a summary of life history and biology, identification, life cycle, physical and geographic limits, economic importance, damage caused by the insect pest, ecology, and monitoring. Selected references are included for sources of additional or more detailed knowledge and information.

A brief key on orders of stored-product insects precedes the first section on beetles, order Coleoptera. A general key then introduces the various beetle families of importance. The pictures of individual species and of morphological characters used for identification of individual species or genera are very detailed and specific. Characters used to separate species or genera have been updated from previous reference manuals. The important families within the Coleoptera are discussed in detail, particularly the species of economic importance. Information on the biology and life history of the various beetle pests is easy to understand, and facts are presented without being cumbersome or wordy. The sections on other insect orders of importance, moths and butterflies (Lepidoptera), psocids, booklice and dustlice (Psocoptera), true bugs (Hemiptera), and parasitic wasps (Hymenoptera) follow the same format used for Coleoptera. Information on the major pest groups is again presented in detail while being clear and concise. The next section of chapters, Finding and Trapping Storage Insects; Collecting, Preserving, and Shipping Specimens for Identification; and References and Resources provide basic information, and also give resources for obtaining more knowledge if that is desired. The final chapter, Index to Species, contains a list of insects arranged by scientific name and common name.

Insects of Stored Products is primarily written to be a basic identification manual and a description of stored-product insects, but it is also an excellent reference for persons with advanced knowledge. The keys, descriptions and biology of the various insect pests, and distribution and pest status give a considerable amount of detailed information in a readily available format. Updated pictures and detailed characters used for identification can be used in a variety of different ways, from industry training sessions to advanced laboratories in formal courses. The comparatively low price also makes this book a valuable addition to any personal or institutional reference library for stored-product insects.

The first section contains four chapters pertaining to what is known about the origin of corn as well as considerable information on historically important germplasm, germplasm resources and an examination of changes in successful corn hybrids. For me the most interesting chapter in this section is an examination of the “era hybrids” from Pioneer Hi-Bred International. The perspective of what changes in performance, physiology, parentage, and genetic diversity have occurred during 70 yr of breeding is fascinating. The second section consists of five chapters that fall under the broad heading “The Corn Plant.” Everything from physiology to breeding, cytogenetics to kernel structure, and the current and future uses of biotechnology in corn improvement is covered. Surprisingly absent from this section is a chapter dedicated to corn genetics. While several of the chapters touch on various aspects of corn genetics, a comprehensive overview of this area is a rather obvious omission. Production is the theme of the third section, starting with a summary of production statistics and closing with a chapter on marketing strategies and practices. In this section, management practices of both developed and developing countries are discussed in side-by-side chapters giving the reader an interesting contrast. The world production chapter was particularly interesting in that it looked at the practices used in the mid-hills of Nepal, winter corn in the Red River Delta of northern Vietnam, hillside production within this volume are several chapters that to my mind contain information rather difficult to obtain from currently available resources. This volume of work is best described as an updated, abridged version of the merger of Corn and Corn Improvement; Corn: Chemistry and Technology; Specialty Corns; and Modern Corn Production. Corn: Origin, History, Technology, and Production makes its own unique contribution as an information resource through its blend of public and private sector perspectives and though the global distribution of the contributors.

Elizabeth A. Lee
University of Guelph
Dep. of Plant Agriculture
Crop Science Bldg.
Guelph, ON N1G 2W1
CANADA
(lizlee@uoguelph.ca)

doi:10.2135/cropsci2005.0005br