
This substantial book seeks a comprehensive treatment of the response of crop productivity to climate change. Part I introduces the scope of the treatise while Part II further sets the scene by describing the changing biosphere with two chapters on climate change and variability and the agricultural contributions to greenhouse gas emissions, respectively. Then, the major Part III, which deals with the responses of crop ecosystems, presents individual chapters for wheat, rice, maize and sorghum, soybean, and cotton, followed by combined treatments for root crops, vegetable crops, tree crops, grasslands, rangelands, and CAM crops. Other chapters in this section present analyses of crop–weed interactions, pests and population dynamics, soil organic matter, and responses to atmospheric contaminants. Part IV has two chapters on mitigation strategies dealing, respectively, with plant breeding and the role of biotechnology. The final, Part V, analyzes economic and social impacts with a consideration of food production in a changing environment.

A book such as this could serve three purposes. First, it should seek to answer the question of how crop productivity will respond to anticipated climate change—an issue very much on the world political agenda. Second, it can direct the development of crop production strategies to adapt optimally crop management to climate change, and to minimize anthropogenic contributions. Third, it can assist the research and development agenda.

While the book is undoubtedly an extensive compendium of knowledge on many of the aspects of the response of crop productivity and climate change, and there are some good individual chapters, it will likely disappoint those readers who seek answers to the major issues identified above. Those who have not already established a position, would I expect, conclude is that there is insufficient information on which to draw conclusions, except that more work is needed. Nor would they find clear direction as to where research effort might be best directed. That there is insufficient knowledge for advice to politicians and the public on the consequences of climatic change on crop productivity might be an appropriate conclusion, but the conclusion is left to the reader. This points to a serious omission in the book. There is no attempt to synthesize the major threads from within the great detail that characterizes most chapters, especially those of the central core, Part III.

Readers who concentrate on individual chapters will find that the science of herbicides rather than the science of weed management was not clear. It might have been more important for the missing integrative treatment.

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While weeds have plagued agriculture since the beginning, the science of weed management is considered relatively young. The beginning of weed science as an organized discipline is usually linked to the discovery and development of 2,4-D in the 1940s. Because of the rapid development of selective herbicides in subsequent years, available resources for weed science research and education were focused on developing use recommendations based on fundamental understanding of the action and behavior of new herbicides. As a result, weed science has often focused on the science of herbicides rather than the weeds themselves.

In recent years, there has been renewed empirical study of weed biology and ecology, nonherbicide control tactics, and integrated weed management systems. This has been driven by issues such as herbicide contamination of the environment, weed resistance to herbicides, increased use in organic production systems, and increasing production costs.

Much of the material in the preface and Chapter 2 is a restatement of the common criticisms of conventional weed control systems. However, this information is necessary. It sets the context for the book, especially for readers familiar with the topic. The intent of the book is to put together a series of chapters (... the emphasis here is on weed management approaches that rely on manipulations of ecological conditions ... ) and the authors fulfilled this intent.

Chapter 2 begins with a solid discussion of weeds and their role in the broader discussions of agricultural production systems and the need for a holistic approach to weed management. This foundation is critical to understanding the importance of weeds and the need for integrated weed management strategies.