

Book review

Climate Change and Global Crop Productivity

Edited by K.R. REDDY and H.F. HODGES. Published by CABI Publishing, May 2000. 488 pages. Price £UK75; US\$140. ISBN 0 85199 439 3. (hardcover)

This book makes a valuable contribution to the greenhouse debate by informing readers about the causes and likely consequences of global warming in relation to crop production. In five parts and 21 chapters it discusses methods of predicting climatic change, the role of today's agriculture in the production and release of greenhouse gases and the likely consequences of these changes for the major food and fibre crops. The emphasis is clearly on the physiological response of crops to environmental change (15 chapters) and therefore readers with a background in this field are likely to gain most from it. It covers climate change-induced physiological responses of crops such as wheat, rice, soybean, sorghum, maize and cotton but also deals with tuberous and vegetable crops, grasslands, rangelands and trees.

The book provides an excellent, basic introduction to our current scientific understanding of causes and consequences of past and future climate variability and change (Chapter 2: Climatic changes and variability by Linda Mearns), including an overview of the IPCC process of informing the policy debate. Unfortunately, this is one of the few chapters where climate variability is specifically mentioned and other chapters could have benefited from this more-inclusive view of 'climate change'.

The descriptions of the physiological responses of crops to climate change focus heavily on CO₂ and temperature increases and to a much lesser extent on the effect of climate change on rainfall. Although this is understandable, considering that the likely atmospheric CO₂ and temperature effects are much better understood than the consequences of climate change on rainfall, significant shifts in rainfall patterns are likely to have a much bigger and more immediate effect on productivity than anything else. A clear, concise discussion of the importance of the various climate components would have been helpful.

Although the book contributes many valuable facts regarding the physiological consequences of anthropogenic pollution of the atmosphere on crops, it has one major short-coming: it lacks integration. Although the final chapters under the headings 'Mitigation Strategies' and 'Economic and Social Impacts' attempt to draw all the component research together by discussing issues such as crop breeding strategies and the role of biotechnology, the reader is left wondering what to do with all this good component research. How do we translate all this knowledge into demonstrable benefits at the farm level? How can we devise management strategies that are best adapted to a changed climate? How can we develop resilient farming systems that are in tune with current climatic conditions and adaptable to climate variability and change? And how will global cropping patterns look in 50 or 100 years time? This is where one or two chapters on crop and cropping systems modelling would have been extremely helpful. This omission is all the more surprising because climate simulation modelling plays such a fundamental role in developing the climate change scenarios in the first place. Why is it that integrating approaches, such as modelling, are accepted in one discipline (*e.g.* climate science) and ignored in others (*e.g.* agricultural science)?

In summary: *Climate Change and Global Crop Productivity* is a valuable resource, particularly for crop or pasture physiologists and agricultural systems scientists. It helps to better understand the likely plant and ecosystems responses to anthropogenic-induced climate change. It provides an overview of our current understanding of greenhouse processes, covers the most important food and fibre crops, but also discusses grasslands, crop-weed interactions, soil organic matter dynamics and pest and population dynamics. However, it fails to draw it all together leaving the reader in the end with a bit of a 'so what?' feeling.

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