challenges and limitations faced by incorporating legumes into agricultural systems. Overall, this book successfully targets a worldwide audience, and it addresses the important contributions of legumes to increased feeding value and nitrogen of grassland systems, resulting in improved sustainability and environmentally friendly agricultural practices.

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Near the end of his distinguished career, the late F.P. Gardner turned his attention to the problem of a suitable beginning text in crop ecology. His project was cut short by his untimely death but has now been completed by colleagues, mainly of the University of Florida, led by T.R. Sinclair. The book is aimed at a broad audience who have only a general background in biology.

After an opening chapter by K.L. Buhr and Sinclair on increasing human population and related problems of food supply and environment, the remaining chapters are presented under two broad headings—Plant Production and Plant Environment. The six chapters in Plant Production concern ecological perspectives (Gardner and Sinclair), diversity and genetics (D.A. Knautt and Gardner), agricultural systems (D.E. McCloud), limits to crop production (Sinclair and Gardner; mainly about radiation-use efficiency), and the roles of soil (E.A. Hanlon and F.M. Rhoads) and water (Sinclair and J.M. Bennett) in crop production. The section on Plant Environment comprises four chapters: radiation (Sinclair and Gardner), temperature (K.J. Boote and Gardner), weather and climate (L.H. Allen and Gardner), and CO₂ (Allen).

The presentations are generally clear and concise (helped by a bit of teleology) and the chapters often provide very nice summaries of a great deal of material. Those on ecological principles (ecological diversity) are not done as well. There are statements about numerous disadvantages of uniformity and lack of genetic diversity, and other matters of agricultural systems without explaining the reasons why crops are grown in certain ways. Counter to my training and experience is a statement that climax communities are more subject to perturbation than seral stages and that cycling is not relied upon to any great extent. These topics are complex and deserve considerable depth of discussion. McCloud does a better job in a good presentation on agricultural systems.

As can be expected in a multiauthored text, coordination problems occur. For example, local cultivars are termed ecotypes (which refers to results of natural selection in wild species) in one place and landraces in another, and two different definitions are given of the lower limit of plant-available water in soils. A better index would help with this. The present one is weak, lacking reference to competition, crop development, cropping (or polyculture), phenology, soil cultivation, and weeds. Nitrogen receives only one index reference despite important discussions throughout the book. In addition, captions for some tables and figures lack information needed for interpretation and, in some cases, fail to cite the source of the information. I found only one serious error worth mentioning, however: Fig. 2.3 on the nitrogen cycle is taken, without correction, from authors who do not understand the cycle or the chemistry involved. There is a tendency to rely entirely on atmospheric sources of nitrogen or ammonium ions from soil.

The volume should serve well in low-level survey courses and as a supplemental reader for a variety of courses. For such uses, the "further reading" lists given for each chapter will help students pursue topics in greater depth.

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