

BOOK REVIEW

ANDREW, C. S. and KAMPRATH, E. J. (Eds.). *Mineral Nutrition of Legumes in Tropical and Subtropical Soils*. CSIRO, Melbourne. Pp. 415. Price \$A16.

Research workers and teachers concerned with the mineral nutrition of tropical legumes will find this book a very significant addition to their resource literature. It comprises the proceedings of a Workshop held at the CSIRO Cunningham Laboratory, Brisbane, in January 1978, under the auspices of the US/Australia Co-operative Science Program. There are 23 chapters, by authors from Australia and the United States, and including some very distinguished names in relevant areas of Plant Nutrition and Soil Science.

The contents are arranged in five sections. Section 1 (4 chapters) is concerned with soils of the tropics and sub-tropics—their genesis, mineralogy, surface charge characteristics and chemistry. Section 2 (9 chapters) deals with soil-legume interactions, including such topics as growth on low fertility soils, mineral characterization of tropical legumes, Al and Mn toxicities, liming and soil chemical reactions affecting the availability of plant nutrients. Legume-*Rhizobium* relations are discussed under Section 3 (4 chapters), with emphasis on conditions of acidity and nutrient deficiency that limit the effectiveness of the symbiosis. Section 4 (4 chapters) is devoted to the availability of nutrients and the diagnosis of nutrient disorders (including the roles of both soil chemistry and plant chemistry and the residual value of fertilizers). The two chapters of Section 5 discuss fertilization of acid, highly-weathered soils.

The Editors point out in the Preface that they have quite deliberately avoided changing the presentation of the various chapters, which appear as they were prepared for the Workshop, apart from modifications to a uniform format. As a result, there is quite a deal of overlap in subject matter. I found this a strength rather than a weakness, since the fact that several authors consider a particular aspect worthy of discussion emphasizes its importance, whilst at the same time giving the reader the opportunity to consider the varying interpretations presented. For example, though not all tropical soils are highly weathered, as several contributors to this volume are careful to point out, many nutritional problems are encountered on the ones that are. Not surprisingly, therefore, the outstanding example of overlap is the aspect that J. S. Russell terms the "syndrome associated with acid soil conditions". This is referred to substantially in at least nine of the chapters, and material is presented ranging from basic soil chemistry to the significance and amelioration of the problem in the field. The end result is an excellent summary of the state of knowledge of this complex problem. Similarly, the importance of phosphorus nutrition receives considerable emphasis, from largely complementary points of view.

Two other examples of the value of allowing authors to present their own material intact are also obvious. The first is the repeated reference (in at least four chapters) to the possibilities of developing species or strains tolerant of adverse conditions characteristic of highly-weathered soils. The second is the proposition that one distinguishing feature of plant nutrition in the tropics may be an interaction between nutrient availability and environmental factors—in particular soil temperature and moisture regime. This aspect is explored to varying degrees in five of the chapters.

Since the papers were prepared for a Workshop, the reader expects not only reviews of the current state of knowledge, but also some emphasis on gaps in existing lines of research, and indeed hopes for some ideas from the authors on possible new lines of attack. He is not disappointed, for such features appear in many of the chapters. One of the strengths of this book is its admirable blend of basic and applied topics, and the depth with which these are pursued. It is rare, for example, to find basic soil chemistry discussed in depth in a book that is mainly concerned with the mineral nutrition of plants—but this has been achieved to considerable advantage by

the Committee responsible for planning the Workshop (E. J. Kamprath, W. A. Jackson, C. S. Andrew, J. S. Russell, F. W. Smith).

At \$A16, the book is excellent value for money. The format is attractive and convenient, and, as one would expect, even the bibliographies associated with 23 chapters amount to a quite significant resource. References are very much up to date—in one chapter, chosen at random, 45 of 88 references are post-1970. All workers in tropical agriculture, but particularly those concerned with the growth of legumes, should ensure that they have access to this excellent publication.

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