BOOK REVIEWS, continued

documented chapter on "Loss of nitrogen from soils" reflects Dr. Allison's longtime interest in this subject.

Six chapters devoted to "Functions and effects of organic matter in mineral soils," are very thorough in dealing with organic matter as a source of plant nutrients, as an ion exchange material, as a factor in soil aggregation and root development, as a factor in water conservation and use efficiency, as a source of phytoxic substances, and as a factor in plant disease control.

This is probably the most complete discussion of functions and effects of organic matter which has been brought together in a single source. There is a section of nine chapters dealing with "Organic matter and crop management problems in mineral soils," concluding with a chapter on the controversial subject of organic farming. Dr. Allison deals with the claims of the organic school in factual, low-key fashion, and ends by quoting some of their more radical statements without further comment. The book ends with a short section on organic soils.

The book is quite expensive, which may limit its adoption in courses in soil science, but it should prove very useful as a reference text. It is very readable, even though long unbroken stretches of printed material may give it the appearance of being formidable. More illustrative material would have been desirable, but it would not be appropriate to mention this as a major criticism of the book, considering the circumstances under which it was published.—F. E. BROADBENT, University of California, Davis.

Advances in Agronomy—Vol. 25


This volume in the Advances in Agronomy series comprises eight reviews on subjects which, according to the editor, are "concrete evidence of the contribution of crop and soil scientists to mankind's effort to feed himself." Four of the papers deal with crops, including comprehensive reviews on crimson clover, genetic control of flowering and growth of sorghum, factors affecting the lodging of wheat, barley, and oats, and aspects of the malting barley industry in the United States. One paper is concerned with environmental quality and considers factors affecting phosphorus levels in runoff and streams. Zero-tillage is the subject of another review and is followed by chapters on ion absorption by plant roots and genesis and management of acid sulfate soils.

The first chapter, "Phosphorus in Runoff and Streams" by J. C. Ryden, J. K. Syers, and R. F. Harris, is particularly timely in view of the continuing controversy concerning agriculture's possible contribution to phosphorus enrichment of streams and standing waters. The authors discuss various factors affecting dynamics and loads of P in runoff and streams, point out certain gaps in our knowledge, and emphasize that future research in this area should be based on a "watershed analysis approach," which they discuss at length.

"Crimson Clover" is a chapter by W. E. Knight and E. A. Hollowell, who discuss the morphology, physiology, culture, utilization, and genetics of crimson clover. This clover is probably the most important annual legume grown in the southern United States and is essential to the rapidly expanding livestock industry and winter grazing program in that region.

The concept of "Zero-Tillage," according to K. Baeumer and W. A. P. Bakermans, refers to tillage systems in which mechanical soil disturbance is limited to seedbed preparation and traffic necessary to apply chemicals for weed control. Zero-tillage is considered to be the most extreme form of minimum tillage. In their chapter they point out that, while zero-tillage is not a panacea, it does offer some interesting possibilities depending on specific soil, cropping, and climatic conditions.

In his chapter on "Genetic Control of Flowering and Growth in Sorghum," J. R. Quinby points out that until now genetics has contributed very little understanding of the flowering and growth of sorghum. He presents an interesting review and discussion of pertinent research and offers a working hypothesis to explain the genetic control of flowering and growth which can be subjected to experimentation.

"Ion Absorption by Plant Roots" has been the subject of many review articles since the ion-carrier concept was introduced some 40 years ago. However, T. K. Hodges has done a commendable job of condensing and organizing the voluminous literature accumulated since then into a particularly useful and comprehensive review, covering such topics as energy-dependent and active-ion transport, kinetics and selectivity of ion absorption, and energetics of ion transport. He also presents his own hypothetical model depicting how inorganic cations and anions are transported across the plasma membrane into root cells.

The chapter by M. J. Pinthus on "Lodging in Wheat, Barley, and Oats: The Phenomenon, Its Causes and Preventive Measures" emphasizes that the exploitation of yield-promoting factors, such as N fertilization or irrigation, depends on the prevention of lodging. Further efforts to prevent lodging, either with chemicals or by breeding for lodging resistance, are needed to produce enough of these cereal crops to meet world food demands.

The chapter on "Genesis and Management of Acid Sulfate Soils" by C. Bloomfield and J. K. Coulter will be of special interest to those concerned with reclaiming and improving these problem soils for crop production. It is unfortunate, however, that genesis receives much greater attention than management.

The volume concludes with a chapter on "Malting Barley in the United States" by G. A. Peterson and A. E. Foster, who discuss the principal aspects of that industry, including the malting process, classification and requirements of malting barleys, genetics and breeding considerations, quality testing procedures, and production practices. Readers will be surprised at what goes into the making of a really good bottle of beer.

Unfortunately, this volume may be overpriced for extensive individual purchase. However, as in the past, it is recommended that research and university libraries continue to acquire these volumes for use by their teaching, research, and extension personnel.—J. F. PARR, USDA Agricultural Research Service, Baton Rouge, Louisiana.