Book Reviews


This book was sponsored by and prepared under the auspices of the American Society of Agronomy. It is well written and is an excellent source of information on important areas of agronomic research and development. Although it deals particularly with the more recent findings and developments in those areas, much historical background is also provided.

Nearly one-third of the book is devoted to water in relation to crops and soils. Interesting and challenging concepts are presented by nine different authors. The subjects considered include the hydrologic cycle, interactions of water and soil, the soil environment and root development, plant-water relations, and soil-plant-water interrelations.

Basic principles in the economics of fertilizer use in crop production are discussed. The authors show by means of three-dimensional graphs the relation between crop yield and the amounts of phosphate and potash applied. Finally, consideration is given to finding the most profitable rates of application and the newer approaches to this problem.

Recent developments in agricultural machinery are presented in an interesting and effective manner. The use of a number of pictures, charts, and graphs is included. Further, the effects of machinery considered include that for seedbed preparation, planting, cultivating, spraying, dusting, and harvesting.

Progress in fertilizer production and technology is presented in good readable form. The phases covered include changes in fertilizer consumption, manufacture of fertilizers containing nitrogen, phosphorus, potassium, and secondary and trace elements; and manufacture of mixed fertilizers containing pesticides and gibberellins.

The discussion of soils and land use in the Netherlands is both interesting and informative. The agricultural and related problems facing this small country are well described, and current methods being used for their solution are presented.

The effect of nitrogen on the availability of soil and fertilizer phosphorus is discussed in adequate detail. The importance of root area, root efficiency, ammonium ion, stage of growth, nitrogen metabolism, salt and pH are emphasized.

This book is high-priority reading for every crops and soils man and should serve as a ready source of information in the areas described. About 1600 pertinent references are listed for the reader's convenience.—O. J. Attoe, University of Wisconsin.

APPLICATION OF GENETICS TO COTTON IMPROVEMENT. By Joseph Hutchinson. New York: Cambridge University Press, American Branch, 32 East 57th Street, New York 22, N. Y. 87 pp. 1959. $3.00.

A cursory reading of this book leaves the impression that the title is misleading and that the author is re-stating theses presented in an earlier publication (Evolution of Gossypium, by Hutchinson et al., 1947, Oxford University Press). But the book warrants much more than a cursory reading.

The author first gives attention to the relatives of cotton as an indication of the limits of genetic diversity available for cotton improvement. The origin and spread of old world cottons (13 chromosomes) and new world cottons (26 chromosomes) are depicted within these limits of diversity. Changes within old and new world cottons represent separate pools of diversity which have been exploited to fit the needs of man.

The apparent association between genetic variability and natural populations size has given distinct evolutionary patterns in cotton. These patterns are of interest to the cotton breeder in that the greatest diversity appears near the periphery rather than near the center of origin which is contrary to the generally accepted thesis of Yavilov. The author emphasizes this in approaching the practical problems faced by cotton breeders.

"Breeding may be regarded as an exercise in the management of variability," the author states. He proposes that a selection index be developed and an estimate of the current genetic variance for each trait subjected to selection pressure maximizes genetic progress. The improvement of African cottons is cited as evidence that the genetic diversity of evolutionary significance has equal significance in cotton improvement. Further, although much could be said about breeding systems, the success of any system is a function of the measurable genetic diversity.

The book is well written and the author's views are clearly stated. These views should excite interest of plant breeders in general and cotton breeders specifically.—B. A. Waddle, Department of Agronomy, University of Arkansas.

EFFICIENT USE OF FERTILIZERS. By V. Ignatieff and H. J. Page. FAO, Viale delle Terme di Caracalla, Rome, Italy, and FAO sales agents. 356 pp. 1958. $4.50 or 22s. 6d.

This revised and enlarged second edition offers a valuable reference for the student interested in readily gaining a broad perspective of world agriculture. The book is well written and organized and has much to offer for the entire spectrum of agricultural workers. The three chapters on disposal and utilization of organic wastes, cropping systems and fertilizers, and soil and nutrient needs of crops throughout the world are particularly outstanding, representing the works of several authorities drawn from over the world. The three chapters on plant nutrient relationships in respect to soil regions, on plant populations, and on commercial fertilizers provide needed background for the broader treatments given to fertilizer use, crop and soil management, and economics of fertilizer use.—George Stanford, Tennessee Valley Authority, Wilson Dam, Ala.


This book is a good reference for courses and research work on soil physics, soil chemistry, soil physiology, and plant physiology. Training in those subjects and in mathematics and physical chemistry is required to understand and apply the theoretical discussions in all the chapters.

The book consists of the following 11 chapters comprising 370 pages:

1. Properties of water and its cycle in nature.
2. The soil as a porous system, hydrophilic.
3. Chemically combined water.
4. Physically combined water, adsorbed water.
5. Water in the gaseous state, vapor.
6. Free water, fixed.
7. Free water, mobile under capillary forces.
8. Free water, mobile by gravity.
9. Water of the soil and plants.
10. Water conservation and irrigation requirement.
11. Classification of soil water.

It has also six tables and an appendix with a glossary for some of the terms used.

The equation in page 48 should be written:

\[ P = \frac{4\pi r_1 r_2}{r_1 + r_2} \]

The book has references to publications from 788 European, American, and Latin authors. Twenty-six books were consulted including the following ones in Spanish:

- Hoyos, de Castro, A. y Maria Vivaldi, J. L., La estatica del sistema suelo-agua (1950) Madrid.
- Iljin, W. S., El agua y los procesos vitales de la planta (1933).
- Tschapek, M., Quimica coloidal del suelo I (1949), Buenos Aires.

More technical and practical books written in Spanish are needed in the field of Soil Science, as well as an approved glossary for proper terms and definitions. I congratulate Dr. Tschapek for his recent contribution.

(Dr. Tschapek, born and trained in Russia in Agronomy and Colloidal Chemistry, went to work in 1942 for the Institute of Colloidal Chemistry in Dresden, Germany, and since 1947 has been in Argentina.)—Juan A. Bonnet, Head, Soil Department, Agricultural Experiment Station, U.P.R., Rio Piedras, Puerto Rico.