BOOK REVIEWS

NUTRITION OF LEGUMES

The purpose of the Fifth Easter School was to bring together researchers in various fields for discussion of problems relating to the nutrition and growth of legumes. Attendance by agronomists, physiologists, bacteriologists, botanists, biochemists, horticulturists, and geneticists indicated a wide range of interests in the school. The Proceedings of this school, a book of 359 pages and 25 chapters, deals with a wide range of experimental data presented by 33 plant and soil scientists on nutrition of legumes in relation to growth, survival, and nitrogen fixation. For convenience the editor has divided the subject matter into six parts: the plant component, the rhizobial component, the symbiotic system, biochemical aspects, field aspects and demonstrations. In the last part a number of demonstrations are described that relate to various phases of nutrition and growth of legumes. The results of recent experiments in various parts of the world are presented that deal with the effects of soil pH and supplies of both major and micronutrient elements on growth and development of the plant as a whole and initiation and growth of nodules. One chapter deals with the harmful effects of aluminum on growth in both solution and soil cultures, a second with the effects of pH, calcium and light intensity on the toxicities of both manganese and aluminum, and a third on the interaction of copper and phosphorus.

A number of chapters are devoted to subjects that are not directly or mainly concerned with plant nutrition. They include botanical and microbiological aspects as indicated by the following: classification of legumes, classification of Rhizobia, physiology of nodule formation, survival of root nodule bacteria, legume-Rhizobia symbiosis, some factors affecting nodulation in the tropics, synthetic nitrogen fixation by non-legumes and recent Belgian studies on symbiosis.

At the end of several chapters a record is given of the discussion that followed the presentation. The book is easy reading, informative and presents a wide range of interesting and pertinent data.—O. J. Attoe, University of Wisconsin.

FINE PARTICLE MEASUREMENT

This book contains a description of many of the techniques currently used for the measurement of particle size, particle size distribution, surface area, pore size, and pore size distribution. Along with each description, adequate theory is presented to give a basic understanding of the method. A discussion of the significance of measurement techniques and their selection is given in Chapter 1.

Methods for particle size include those utilizing microscopy, sieving, sedimentation, inertial techniques, and radiation scattering and transmission. For surface area measurement, such techniques as are described as those involving permeametry, gas adsorption, and liquid-phase sorption, along with several other techniques. In this book, the authors define pore volume as the volume of pores within individual particles. It does not include the volume between individual particles. Several techniques are discussed for measuring pore volume. These include direct measurement, Displacement, X-rays, gas flow analysis, gas adsorption or desorption, liquid-phase sorption and from powder flow properties.

Data are presented in the Appendix which show comparisons of different methods and which give the order-of-magnitude of the various properties for certain type materials. Over 600 references are listed in the Bibliography. This book should be very useful for any person interested in fine particle measurement.—D. D. Evans, Oregon State College, Corvallis.

FOREST SOILS
Their Properties and Relation to Silviculture

Forest Soils is a new and comprehensive treatment of Dr. Wilde's original monograph, Forest Soils and Forest Growth. This text, by one of the leading authorities in the field of forest soils, deals with the fundamentals of soil science and their application in the field of silviculture.

The book is written in two sections. The first, soil as a medium for plant growth, contains 10 chapters as an orthodox development of forest soil science. This section covers the historical development of forest soils, soil minerals, organic horizons, soil genesis, great soil groups, physical and chemical properties of forest soils and the relation of forest soils to vegetation. The second section, soil science and silviculture, stresses the application of soil science to forest management. This section is headed by three excellent chapters on nursery management, including chapters on fertilization, adjustment and control of pests in nursery soils. Most of the background work on nursery management stems from Dr. Wilde's extensive research and experience in the Lake States, however, the principles established are applicable in any region. The succeeding chapters include techniques and problems in forest soil survey, reforestation, soil improvement, silvicultural cuttings and forest management. Forest problems discussed in these chapters dwell at length on Lake States conditions, however they are well documented and augmented by many examples of European work.

This book contains 552 references, including most of the pertinent European literature along with a rather complete coverage of American forest soil work. Dr. Wilde has introduced and defined many new technical terms, some of which have already been accepted by workers in the field of forest soils.

This text is an outstanding contribution to American forestry literature and will be welcomed by students and workers in the field of forest soils.—E. G. Steinbrener, Weyerhaeuser Timber Company, Centralia, Wash.