BOOK REVIEWS

Sugar-Beet Nutrition

The author suggests the need for a monograph on the nutrient requirements of sugarbeets that is comprehensive and up to date. He states, however, that in writing this book, "Where this information on a topic was lacking from British experiments, foreign evidence . . . has been used." This statement truly reflects the scope of the book: Sugar-Beet Nutrition may be described as an extended British monograph; it is not a world monograph.

The book contains some errors of omission and commission. In its conclusion section, the chapter on Phosphorus and Sulfur contains no mention of sulfur. The introduction to the chapter on Potassium and Sodium implies that potassium fertilizer for sugarbeets is often needed in hot, dry climates, but potassium fertilizer-sugarbeet yield data are given only for subhumid climates. Actually the response of sugarbeet to potassium fertilizer in arid and semiarid soils is a very rare phenomenon. On page 53, soil tests of 0–75 ppm P should read 0–75 ppm PO₄. On page 56 sulfur content in sugarbeet laminae of 3 to 7% should read 0.3 to 0.7%. In his discussion on the forms of potassium fertilizer for sugarbeet, only one citation is given. As quoted, four forms of potassium (KCl, K₂SO₄, KNO₃, and K-MgSO₄) gave equal yields and quality. Yet in his conclusions on the chapter on Time, Form, and Method of Fertilizer Application, he states, "There is little evidence that giving potassium . . . in any form other than the chloride would be beneficial for sugarbeet."

Thousands of soil fertility experiments on sugarbeets have been done in Britain over the past 40+ years. This work is thoroughly reviewed in Sugar-Beet Nutrition. Accordingly, the book provides ready access to the British experience in this area of agricultural science and technology, and as such, will be highly appreciated by students of sugarbeet culture. This will be especially true if the immediate concern is for sugarbeet production under subhumid conditions.—D. W. James, Professor, Dep. of Soil Science and Biometeorology, Utah State University, Logan.

Isotopes and Radiation in Soil-Plant Relationships Including Forestry

This book consists of 54 papers presented at a symposium on the Use of Isotopes and Radiation in Research on Soil-Plant Relationships Including Forestry held in Vienna, Austria, December 13–17, 1971. Organized jointly by the IAEA and FAO of the United Nations, the symposium was attended by 116 participants from 34 countries and six international organizations. Seven of the 54 papers are in French, three in Russian, and the remainder are in English. All have English summaries. The symposium was divided into the following sections: (i) Ion Uptake and Translocation; (ii) Soil Chemistry and Analytical Methods; (iii) Forestry; and (iv) Soil Fertility and Nutrient Availability.

Twelve papers were presented in the first section on topics such as factors affecting ion uptake, mass flow and diffusion supply mechanisms, role of plasma membrane and tonoplast ATP in ion uptake, and methods for improving plant growth in saline and calcareous soils. In the Soil Chemistry and Analytical Methods Section, 11 papers were presented emphasizing the use of radioactive and stable isotopes in experiments dealing with ion transport, characterization of nutrients and diffusion, nutrient availability and transformations, complex humic acid-clay formations, and simulation of cation exchange and movement. Two papers dealt with trace elements, radiolytic and comparison of optical emission spectrometry and mass spectrometry for the determination of nitrogen isotopes in biological systems. Special interest was placed on Forestry and 17 papers were presented that covered tree population, tree location, ecology and mineral cycling, nitrogen transformations, and recovery in humic soils, soil-plant regimes, transpiration, and biomass and root activity. Fourteen papers were presented in the Soil Fertility and Nutrient Availability section. These papers included recovery of nitrogen, phosphorus cycling, behavior and uptake of ruthenium, distribution of strontium and cesium in aquatic and mineral fractions of soils, sensitivity of soil moisture measurement techniques, and water utilization efficiency and balance.

It is difficult to evaluate the usefulness of this book for any one specific profession due to the broad spectrum of topics covered. However, this book would be of interest and provide a good reference to those that have overlapping interests in plant physiology, nutrition, soil fertility, and forestry.—R. L. Westerman, Assistant Professor, Dep. of Soils, Water, and Engineering, University of Arizona, Tucson.

Mode of Action of Herbicides

Mode of Action of Herbicides is composed of 22 chapters with classification, nomenclature, and related information on herbicides in the appendix. The first seven chapters are composed of general information regarding herbicide classification and selectivity, morphological response, absorption and translocation, molecular fate, biochemical response, and mode of action. The remaining chapters cover specific herbicides arranged according to chemical class such as amides, benzoics, phenoxy's, etc. In each chapter the herbicide class is discussed according to effects on plant growth and development, absorption and translocation in plant, breakdown in the plant and soil, biochemical responses, and mode of action.

A very timely appendix provides several pieces of information including an alphabetical listing of herbicides by common name, trade name, chemical name, and manufacturer. A second listing is by trade name and corresponding common name. This includes at least one error where CP-50144 is referred to as Methaolor. This should be Alachlor. Also included is a table on physical, chemical, and toxicological properties of herbicides. These appendix tables should provide an invaluable reference source for agronomists and extension personnel.

In the preface to this book the authors state that this book attempts to provide a basic introduction to the physiology and biochemistry of chemical weed killers and summarize the body of information that has been acquired concerning the properties, commercial forms, and field uses of some 150 products now available. In accomplishing this purpose, the book succeeds quite well. If there are any weaknesses, they occur in these first seven chapters. There is some duplication in this section and the succeeding chapters on specific herbicides. The specific chapter on absorption and translocation neglects some transport theories that exist in the current literature and presents only one theory of photosynthate movement and associated transport of herbicides. The statement that "annual weed control by chemicals in row crops soon displaced the mechanical cultivator" overstates the spectrum of herbicidal activity currently available. Herbicides certainly are a necessary management tool for good agronomic practices but we have scarcely seen the last of mechanical cultivation. The chapter on classification and selectivity of herbicides is concise and helpful in that it enables one to easily follow herbicidal activity both on a use basis (i.e. preplant, chemical fallow, prescence) or on an action basis (i.e. contact action, translocation, and soil absorption).

The chapters on specific herbicide classes, Chapter 8 thru 22, are excellent sources for information, teaching, or reference. The references are very up-to-date and complete. This section of the book is by far the strongest portion of the book. There are only a few minor errors in the entire text which enhances its readability.

This book should be very helpful to anyone working with herbicides or in related areas. It should also serve as an excellent text for an advanced course in weed science, agronomic management, or agricultural chemicals.—James C. Graham, Research Specialist, Monsanto Commercial Products Co., St. Louis, Missouri.