method of fertilizer practices provides new interest to these ever-changing topics.

Although not sufficiently complete or thorough to be a good textbook, the monograph might serve as valuable supplementary reading for a course in plant nutrition or soil fertilization, or even soil chemistry. The underlying hypothesis extends into several controversial areas and might be used to stimulate some lively discussions. In the opinion of the reviewer, the kinetic hypothesis offered here is more valid than is indicated by prevailing beliefs; it is presently useful in at least a qualitative sense in providing an intriguing and unifying concept of some complex phenomena and will stimulate additional research in the future pertaining to the kinetics of ion movement in the soil-plant system.—R. A. Olsen, Montana State University, Bozeman.

Mineral Specimens


This collection of 100 color photographs of natural minerals will be of aid primarily to the amateur geologist. The purpose of the book, according to the foreword, is to show the diversity of color and form in minerals and provide information about their chemistry, structure, characteristic properties, and uses. The technical information, which is presented for each mineral in outline form, includes chemical composition, crystallography, physical properties, occurrence and uses, and occasionally optical properties and methods for identification. The captions used with each photograph contain explanations about synonyms, nomenclature, and varieties. A brief glossary of technical terms is included.—JDS.

Forest Fertilization: Theory and Practice


The purposes of this compilation of 38 papers are to bring together recent information and to update knowledge in the field of forest fertilization. Subjects treated at the symposium included (i) ecological considerations basic to forest fertilization, (ii) interactions among trees and their associated organisms in the intensively cultured forest, (iii) nitrogen and phosphorus in forest tree nutrition, (iv) potassium, magnesium, sulfur, and micronutrients in forest tree nutrition, (v) current trends and practices in forest fertilization in the U. S., (vi) fertilizer development and evaluation, and (vii) avenues for expanded cooperation and communication in forest nutrition and fertilization research. The 28 color plates illustrate nutrient deficiency symptoms in forest tree species.—JDS.

Tillage for Greater Crop Production—Proceedings of the 1967 Tillage Conference


This publication contains the papers delivered at the special conference in Detroit, Mich., December 11 and 12, 1967. The objectives of the meeting were “(i) to provide a vehicle for the exchange of ideas by various specialists in the field of crop tillage, (ii) to define the tillage needs of crops in terms of environment, soil characteristics, and nutrient requirements, (iii) to evaluate the effects of tillage on soil properties and moisture content, (iv) to discuss the role of tillage in soil and water conservation, (v) to explore the possibilities of more efficient mechanization of tillage and conservation practices.” Twenty-nine titles concerned with these problems are included.—JDS.

Grasses and Legumes for Soil Conservation in the Pacific Northwest and Great Basin States


This outstanding handbook summarizes 32 years of work with grasses and legumes for use in soil and water conservation in the Pacific Northwest and Great Basin States. It covers such important items as growth habits, adaptation, cultural requirements, principal uses, and management requirements for soil protection and forage and seed production, as well as special uses such as food and cover for wildlife and recreational use; 36 species of grass and 16 species of legumes are covered.

This publication should be invaluable to everyone interested in grasses and legumes and their use and management. Outstanding features are the presentation of data by conservation-use groups, colored maps that delineate 46 agricultural zones, 31 plates of line drawings of important and new species, and a table giving average seed characteristics and standards for each of the 72 species.

The use groups are based on the conservation job each species can do on the farm, ranch, watershed, or other kind of land needing treatment and are tenfold. Use groups are used to divide more than 15,000 accessions that were comparatively evaluated in the five Plant Materials Centers in the area.

Varieties of 36 species are described, and 23 of these varieties are new and were developed by the Soil Conservation Service Plant Materials Centers. Data presented for each species include one or several of the following: yield of roots, tops, and seed under irrigated and nonirrigated conditions; ability to resist soil erosion by wind or water; quality of forage as measured by lignin content and digestibility; resistance to insects and plant diseases; cultural methods for establishment; management of established plants; response to fertilizers for cover, forage, or seed; and methods for grazing in pastures or rangelands.

Another outstanding feature of this handbook is the maps, which divide the area into 46 agricultural zones according to major land use, soil associations, and climatic and geographical characteristics. Each of the 72 species is oriented to the agricultural zones to which it is adapted and to the major soil series in each zone.

The black and white photographs and the line drawings of 31 species are excellent. (These original line drawings are by Lucretia B. Hamilton, wife of the former manager of the Tucson, Ariz., Plant Materials Center.) Each plate includes the major plant characteristics: the above-ground portion and root. In addition there are detailed drawings of the seed head, spikelet or floret, and ligule and the legend for identification purposes.

Dr. Hafenrichter and his staff of Plant Materials Specialists have done an excellent job of condensing a large amount of factual detailed information and are to be congratulated for their work.—W. W. Austin, Consulting Conservation Agronomist, Orinda, Calif. 94563.

Policy Directions for U. S. Agriculture


This book presents a review of the broad agricultural situation and its implications for policy. The approach is general rather than detailed. The book is divided into four parts which deal with (i) the sociological and economic implications of the generally poor living conditions in rural areas, (ii) the farming business—farm management and labor, farm income, foreign trade, and capital structure, (iii) agricultural problems and potentialities for the future, particularly for the year 2,000, and (iv) an evaluation of problems arising from changes in agriculture. The author is concerned with the paradoxical state of U.S. agriculture in the late 1960s: the high productivity of agricultural research and farm products versus the widespread poverty among rural people, the lack of youngsters willing to enter farming, the deterioration of the rural community, unsuccessful farm programs, inflated land prices, and unwise use of land and water resources.—JDS.