BOOK REVIEWS

MONOGRAPH ON NITROGEN FIXATION IN SOILS

Agriculture, Volume IV, Agricultural Society, Sheila Dhar Institute of Soil Science, University of Allahabad, India. 1954.

At the outset of this monograph, S. P. Mitra, one of several contributors, states that the only practical solution to the problem of world hunger is to increase the productivity of land already under cultivation. In countries such as India, the price of commercial nitrogenous fertilizers puts them far beyond the means of the average farmer, and thus nitrogen fixation by natural means in the field, assumes utmost importance. Contrary to the usual approach in the United States, these workers place relatively minor emphasis on symbiotic and non-symbiotic biological nitrogen fixation. Workers in America will be interested in the rather lengthy sections devoted to photochemical nitrogen fixation, a facet of the overall nitrogen problem which receives scant attention in this country.

According to theories first developed by N. R. Dhar, neither soil nor bacteria are absolutely necessary for nitrogen fixation. Any surface where oxygen, hydrogen, nitrogen and energy material can come in contact in the presence of light suffices for the fixation reaction to occur. Results of investigations utilizing sawdust, straw, coal, and other organic energy sources are discussed. A final paper proposes a photochemical theory to account for the formation of nitrate beds in nature.

It is regrettable, especially since the existence of the photochemical reaction is still subject to considerable controversy, that the authors have not detailed experimental procedures. One would like to know, for example, the techniques employed to ensure the stability so essential in many of these studies. Since it is often difficult to trace small changes in the nitrogen status soils, a knowledge of sampling and analytical methods used would also be helpful in evaluating the significance of the various papers in this monograph. - Howard Loewenstein

HEAT CONDUCTION—WITH ENGINEERING, GEOLOGICAL AND OTHER APPLICATIONS


This is a very useful book for students, engineers, and research workers, covering in a clear, concise manner the conventional mathematical methods for calculating heat flow and temperature distribution for numerous practical cases. Various short cut auxiliary methods are also given, along with illustrations.

Applications of the extensive mathematical literature dealing with heat problems are made to other fields, including agricultural soils and soil mechanics. The similarity of Fourier's law for heat flow to the Darcy law for saturated flow of water in soil is pointed out so that methods and solutions for heat problems apply directly for some water flow problems in soils. The same applies to water vapor transfer in relatively dry soils where a linear diffusion equation holds. The driving force for unsaturated flow, however, is hyperbolically related to water concentration and the heat methods do not apply to this important case.

Heat and temperature problems related to soils are dealt with in several chapters and soil physicists will find this book of interest and use. Conversion factors for various units, and methods for measuring various thermal properties of solids and liquids are pointed out. The authors are to be congratulated for using metric units mostly in their problems and illustrations. — L. A. R.

METHODS OF SURVEYING AND MEASURING VEGETATION

The second part deals with the criteria of analysis, frequency of occurrence, area covered and weight.

The third part covers various measures of productivity, estimate of cover, weight estimate, the animal as a measure of weight, estimate of weight, linear measurement and range condition.

Papers are reviewed under the appropriate sub-headings with comments as to the suitability of the methods employed. One may feel that a somewhat more critical appraisal is desirable. However, in view of the diverse objectives reported and the extreme variation in types of vegetation involved, it is possibly too much to expect that there is an universally superior method. The author has performed a real service in assembling and coordinating this material, examples are numerous and presented in adequate detail. The illustrations of the various grassland and grass-shrub types are particularly good. More than 300 references, bibliography and approximately 50 additional citations are provided as providing background information.

The review should be particularly useful to ecologists, agricultural economists, animal husbandmen and range management personnel responsible for pasture evaluation and management.

MARKETING (THE YEARBOOK OF AGRICULTURE)


This volume is the 55th in the series of these useful volumes issued by the U. S. Department of Agriculture. The publication, marketing, and the book covers the complete range of the product from the time it leaves the farm to its destination.

Subjects discussed in the volume include sales to markets, food retailers, trade abroad, transportation, storage, and processing, grades and standards, cooperative marketing, fair dealing, ownership, prices and pricing, and efficiency.

As in other recent yearbooks, this year's volume is divided into seven parts, many of whom are USDA employees. Others are professors in colleges or workers in private firms. Each member of Congress receives a certain number of copies for free distribution among farmers, libraries, students, and other persons and institutions. If your Congressman has exhausted his supply, copies may be purchased through the Superintendent of Documents.

FARM BUILDINGS, 4TH EDITION


This book is designed as a textbook for a one-semester course. Special consideration is given to such factors as efficiency, functional utility and flexibility of use and modern-day principles of farm buildings. This new edition of the book up-to-date to include structures for dairy, hog, poultry, livestock, and utility-type buildings. There are sections on buildings for cattle, beef cattle, sheep, grain, poultry, and general residential housing. These chapters are developed to guide the reader in making a wise choice of plans, materials, and other essential elements.