
This is a revised edition of a book which was first published in 1957. Little of the first edition has been rewritten. However, a number of additions have been made, expanding the book from 236 to 313 pages. The titles and majority of subtitles in the first seven parts are unchanged. These sections deal with general properties of porous media, interaction of fluids with porous media, Darcy's law and solution, concept of permeability, and general flow equations. The eighth and final section in the first edition, which dealt with multiple phase flow, has been expanded into sections on elementary displacement theory, immiscible multiple phase flow, and miscible displacement. The additions in the revision reflect both recent advances in the field and the author's more active involvement in the field. This is particularly reflected in the final section on miscible displacement which is of increasing interest to soil physicists.

The book grew originally out of literature review and, as such, covers a much wider range of the world literature in several fields than is available to most soil physicists. Experimental details and applications are superseded in favor of general physics principles. Sufficient details are presented to allow the reader to determine how a given measurement might be made and the references are adequate to satisfy one who needs specific information.

In view of the author's employment by the oil industry, it is not surprising that the notation and examples are not primarily those from the soils literature. However, few pertinent soil papers appear to have been overlooked and coverage of several other fields seems to be equally complete. Although a number of important phenomena related to the flow of fluids in soils are not considered in the book, or are only briefly mentioned, the edition should be even more useful to soil physicists than the first edition. It should be particularly useful as a key to the vast amount of literature in other fields directly related to fluid physics. As a fairly complete review of the theoretical treatments of fluid flow in porous media, it should also be helpful to students and instructors in graduate courses in soil physics.—W. R. Gardner, U.S. Salinity Laboratory, Riverside, Calif.


The English edition of this publication by R. W. Jugenheimer of the University of Illinois was reviewed in the Agronomy Journal, Vol. 52, No. 11, 1960.

In recent times, the F.A.O. has published both French and Spanish editions. This certainly will make the information it provides more widely available and useful throughout the world.

Further, for graduate students in English-speaking countries, these translations should be especially appropriate as texts for meeting the foreign language requirements leading to the Ph.D. degree.—N. F. Neal, University of Wisconsin.


As the other eleven annual volumes of this popular series have done, this twelfth volume covers several major subjects in the field of agronomy, making it of broad interest to a large majority of workers in crops and in soils. Eighteen authors with outstanding records in their various specialties contributed to the eight sections of the volume. Four sections deal primarily with soil and soil-plant relations, three are concerned with various aspects of the growth production of important crops, and one presents the structure of agronomy in the southwestern USA.

About one-half of the section on THE CLAY FRACTION OF SOILS gives a brief but adequate discussion of the origin, crystal structure, morphology, identification and estimation of the clay minerals in the clay fraction. The other half covers the effects of the clay fraction chemical and physical reactions of soils.

The section on TECHNOLOGICAL ADVANCES IN GRASS AND LEGUME SEED PRODUCTION AND TESTING includes subsections on varietal purity, cultural practices, insect pollination, insect damage and control, disease control, and quality determination. Covering many important techniques and most of the common forage varieties and their pathogens and including 8 pages of references this section will be of great help to forage seed technologists and growers.

Discussion of FERTILIZER IN FORESTS is divided into "two very distinct" parts—SOIL FERTILITY IN FOREST NURSERIES and Fertilization of Forest Trees—since nutrient requirements and potential returns under these two situations are quite different. Considerable research in this little-known field is described indicating the growing importance of forest crops.

The limited availability of water is the dominant feature of AGRONOMY IN THE SOUTHWEST. Terrain, soils, and climate vary greatly, but irrigation and dryland farming form the basic agricultural pattern in the area. The authors very effectively describe the resources and practices of the area and the wide variety of crops grown.

More than a dozen essential chemical elements are considered in the MINERAL NUTRITION OF SOYBEANS—with concentration in plant parts, uptake, redistribution and fertilization for each element being described in greater or less detail. The author projects his broad experience into a list of five promising areas for further research and indicates returns from this crop.

The next section, PHYSIOLOGY OF THE SOYBEAN by a different author, is a natural sequel and gives the reader a complete picture of the development of this important crop. The productivity potential of this species is emphasized, along with questions as to how this potential may be realized.

The section on WATER INFILTRATION INTO SOILS discusses the many methods for measuring this important property of soils and the theoretical considerations underlying these methods.

The section on RED CLOVER covers very adequately the major biological, and cultural aspects of this important crop, with a brief discussion of its economic importance and early history.

Forty-three pages of REFERENCES in the several sections will help readers locate an abundance of information on each of the subjects covered. About 1700 authors are included in the Authors Index, with from one to fourteen references for each. Even allowing for multiple authorships of many references, this list is indeed impressive.

Most crops and soil scientists should own this book and all should consult it.


This book will be of interest to agriculturists, physiologists, biochemists, and scientists engaged in the area of chemical warfare. It is intended to serve two functions: to be a source book on organophosphate research and to show how organophosphate poisoning of animals can be understood in terms of events at the molecular level. The author considers his book to be a summary of the first phase of organophosphate research; a phase which will permit a more sophisticated approach to the whole question of organophosphate action.

The chapter of most interest to agronomists is on Effect in Plants' in which the author gives a very brief discussion of systemic activity, considerable discussion on metabolism of these compounds in plants, a tabulation of sources of residue data on plants and plant parts and a brief treatment of phytotoxicity. Entomologists will be interested in the chapter on 'Effects in Insects'.

The text is abundantly supplied with tabular and graphic data and, where possible, equations are given showing metabolic pathways and degradation products. In general, the author has performed an excellent service in bringing together a large number of references in a very specialized area of endeavor. For chemists and physiologists, the book will be of considerable value and easily read; others may find it difficult. It will probably have limited use by agronomists.—Charles F. Eno, University of Florida.