
Quite likely it is an understatement, but the author points out that "probably more than half the land surface of Africa carries a vegetation type of which grass is an essential feature." Since overgrazing is a common difficulty in much of Africa, range management knowledge of rapidly growing importance there and Rattray's volume, with its accompanying map of continental grass types, is of basic significance in providing for proper land use.

The bulk of the book is devoted to brief discussions of the grass and other vegetation types given on the map. The composition, contribution, climatic and soil requirements of these types, and their values for grazing and as areas for cultivation are given. Twenty-three plant genera have been designated in distinguishing the various vegetative associations.

There are interesting brief analyses of successional changes, which reveal especially the effects of vegetation of fire, shifting cultivation, grazing, and trampling. There is a good bibliography.

—George A. Petrides, Michigan State University, East Lansing.

SOIL STRUCTURE AND CONDITION OF ITS FORMATION. By P. V. Vershinn, Academy of Science, USSR. Moscow, Russia, 188 pp. 1958. (In Russian).

In view of the importance that the Russian soil scientists place on soil structure, a monograph on soil structure is published periodically in the Soviet Union. The latest book on soil structure is that by Vershinn. Monographs of this type would naturally rely on Russian publications of which there are 120 references cited. However, 20 references from Germany, France, England and USA are used to support statements made in the monograph. The book is factual in that 53 tables and 41 figures are included as well as several data are given in tabular form but not numbered. The content of the book is given by chapters:

Chap. I. Concept of soil structure, its agronomical value and method of determination. Vershinn traces the study of soil structure from the time of Homer who mentions the friable structure of soil till the present day.

Chap. II. Cohesion of soil particles. Tensile stress of soil material is measured by placing the soil in a figure-8 form and pulling the 2 halves apart. Crushing strength is also measured. As is obvious from these types of measurements that the moisture content, amount of organic matter, type of cations would affect the values obtained. Vershinn cites several tables and figures on this subject.

Chap. III. Crumbliness of soil mass into structural units. The effects of drying, freezing and thawing, cultivation, roots, and earthworms are discussed at length.

Chap. IV. Genesis of water-stable soil aggregates. Concept of water-stable aggregates includes the air inside the aggregate, moisture content of soil at the time of wetting, nature of cementing agents, and method of wetting. Importance of cations, especially calcium, is associated with the organic matter.

Chap. V. Microbiological factor of formation of soil structure. He differentiates labile and resistant water-stable aggregates formed by microorganisms. The former has compounds of non-protein type, the latter humic types. Climatic conditions give rise to these compounds—sierozems to labile types and chernozems to stabile types.

Chap. VI. Restoration and accumulation of water-stable aggregates under grasses.

Chap. VII. Artificial structural formation. (This is the longest chapter.) Work on artificial structural formers was begun in 1932 at the Agricultural Physics Institute. A discussion on the American synthetic products used for stabilizing structural units is given. Extensive use is made of the Krlium articles which appeared in Soil Science in 1952. Much factual material is presented on the yields of crops (peanuts, barley, tomatoes, potatoes, oats, grasses, wheat) associated with water-stable aggregates where NPK fertilizer has been used.

The monograph is especially recommended to students studying Russian. The book is easy to read as the sentences are short and much of the text material refers to the tables and figures, hence the reading is easy to follow.—A. P. Mazurak, University of Nebraska.


This book contains practical discussions of problems of interest to all who measure pH values. The first two chapters contain a review of the basic theory of the nature of solutions and the definition of pH and the other thirteen chapters deal with problems of measurement. Theoretical and mathematical treatments are used only as needed to help the reader understand the likely errors and limitations in using various types of equipment. Discussions of value to research workers in soils and agronomy are: buffer solutions, colorimetric methods, glass electrodes and reference electrodes, pH and redox, measuring instruments, E. M. F. temperature characteristics of pH cells, techniques of buffer standardization of pH meters with glass-electrode assemblies, and pH titrations and automatic pH titrations. Two chapters that might be of little value to soils and agronomy specialists deal with industrial pH measurements and automatic pH control, although these may be of interest to fertilizer technologists.

While too specialized for a text in courses in soils or agronomy, it would be a valuable reference book for a departmental or personal library. The teacher of soil chemistry will find it a help in producing lectures and demonstrations.

The author has used the sign of electrode half potentials according to the "European" system and most of the materials used for example are products of Great Britain. These factors, however, do not represent a serious problem in the use of the book.—P. F. Pratt, University of California, Riverside.


This new edition of Dr. Donahue's book should be widely accepted by high school vocational agriculture departments and by many farm and city readers with an interest in the soil. While it is a simplified discussion, aimed to serve those without an extensive knowledge of chemistry, geology, and the other sciences, it will not be easy reading even for the average high school student. It may serve better as a reference book in vocational agriculture libraries than as a text for these classes.

This edition is largely reorganized and is enlarged (an additional 122 pages). It contains 20 chapters. The first 13 chapters deal with the soil itself, its importance in crop production, how to judge land (a 44-page section), the importance of organic matter, lime, and fertilizers, and brief accounts of the necessity and usefulness of tillage, water and soil conservation measures, and irrigation and drainage practices. The last 7 chapters point up the specific problems and practices that may be involved in the wise use of soil and water for field crop, garden, lawn, pasture, rangeland, orchard, and forest production. Three appendices are included: (a) the addresses of the agricultural experiment station and of the Soil Conservation Service's state office in each state, (b) a series of conversion factors of general usefulness, and (c) a short glossary or "definition of terms".

Reference to the soils' literature is included as footnotes to tables of data and in reference sections at the end of each chapter. Some of the references will be easy to obtain—United States Yearbooks of Agriculture and state experiment station and USDA publications such as circulars and bulletins. However, some of the references are to publications that will likely be difficult for readers away from college or university campuses to obtain.

The discussion is clear and down-to-earth. Illustrative material is used profusely. Considerable space is given to demonstrations to explain soils and soil management practices to adults or to young people. Proposed dialogue for some of these demonstrations is given in several chapters.

The main emphasis in this, as in the first edition, is on the management of the soil, on the soil as it is used in the production of food and fiber, and how it is related to the human body, except as this information may be necessary to explain the why and the how of management practices. While the book has an American slant, the universality of soil management principles is emphasized time and again.

While this is not a book that will be read simply for pleasure, it will prove very valuable to the student or farmer who will read this elementary yet comprehensive discussion of soils and soil management.—J. A. Hobbs, Kansas State University, Manhattan.