Principles of Nematology

This book represents another important contribution to the relatively undeveloped but rapidly progressing field of nematology. It is specifically designed as a text and guide book for students and workers in nematology and other agricultural sciences. Plant parasitic nematodes are stressed but approximately 100 free-living species are described and illustrated. The text is well written, adequately documented, and contains numerous excellent illustrations. The author has approached his subject material primarily from the taxonomic point of view, however, ecological, biological, and control aspects are adequately handled. The first chapter contains an introduction; presents an excellent history of the field; discusses the role of plant parasitic nematodes in agriculture, methods of control, and experimental techniques; and offers suggestions for training nematologists. The next chapter presents the techniques for collecting soil and plant samples and for separating the nematodes from these materials; the third deals with microscopic techniques, morphology and identification; and the fourth outlines the essentials of classification. The remaining chapters, namely 5 through 17, present more detailed information on the groups of nematodes considered to be of greatest importance to agricultural scientists. Such items as morphology, life history, identification, hosts, symptomology of infested plants, and control are stressed.

The great enthusiasm of the author for the field of nematology is evident to the reader. In the discussion of certain complex root-parasite relationships such as the citrus replant problem, where organisms in addition to nematodes are known to be involved, the role of the nematodes may even be slightly overemphasized. In the discussion of techniques, the comfort of the investigator is considered and even medical advice is offered, i.e., on page 57 it is stated: "If eyestreem develops from excessive use of the microscope, take 5,000 to 10,000 units of vitamin A each day."

A few critical comments of minor importance may be made. Many nematologists do not agree with the statement on page 32 that nemas with large apertures are more easily killed by soil fumigants than are those with minute apertures. Space is given to the questionable genus and species, Chitinolenchus paragracilis while Pratrenchoides is omitted. A text or reference book may not be the proper place to describe a new species (page 397). A brief discussion of the influence of fumigation treatments on the chemical and additional microbiological properties of soils placed in Chapter 1, would have perhaps been in order. These points, however, are not serious. The book represents an excellent general treatment of the field of soil and plant nematology and should be very useful to all biologists, plant pathologists, soil microbiologists, and other interested agricultural and biological scientists.—J. P. MARTIN, University of California, Riverside.

Soil Structure and Condition of Its Formation

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 Vershchin. There are 120 Russian publications 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 43 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:

I. Concept of soil structure, its agronomical value and method of determination. Vershchin traces the story of soil structure from the time of Homer, who mentions the friable structure of soil, up to the present day. However, the modern development of soil structure work is attributed to Hubby in Germany, and studied by Dokuchaev and Kostichev in Russia. Later Barakov, Fadeev, Sabinin and Vilyam expanded the knowledge of soil structure. The classification of soil structure that we use now was stated to have been proposed by Wang in 1934, was adopted by Zakharov in 1931. Vershchin presents an interesting scheme for classifying soil structural properties according to the origin of structural formation, water-stability of aggregates, size of aggregates, porosity, and biological resistance of aggregates to decomposition.

II. Cohesion of soil particles. Tensile stress of soil material is measured by placing the soil in a figure 8 form and pulling the two halves apart. Crushing strength is also measured.

III. Crumbliness of soil mass into structural units. The effect of drying (measures the length of cracks per cm.2) and freezing and thawing is discussed at length. Dry-aggregate analysis is extensively used in evaluating the crumbliness of the soil.

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. Vershinin presents data showing that organic matter not soluble in HCl but soluble in NaOH is responsible for water-stable aggregates.

V. Microbiological factor of formation of soil structure. He differentiates labile and resistant water-stable aggregates formed by microorganisms. The former has compounds of protein type, the latter humic types. Climatic conditions give rise to these compounds; Sierozems to labile types whereas Chernozems to stable types.

VI. Restoration and accumulation of water-stable aggregates under grasses. Vilyam in 1895 stressed the importance of grass to imparting water-stable aggregates to aggregates. Much of the Russian literature on grasses and soil structure came after World War I.

VII. Artificial structural formation. This chapter is the longest one in the monograph. It is of interest to note that the work on artificial structural formers was begun in 1932 at the Agricultural Physics Institute using vice products, colloid A (mixture of protein and sulfate liquor from paper products), peat-glu (extract with 1% KOH), and an extract from resin which is apparently comparable to Krilium. A discussion on the American synthetic products used for stabilizing structural units is given. Extensive use is made of the Krilium articles which appeared in Soil Science in 1952. Much factual material is presented in this chapter on the yields of crops (peanuts, barley, tomatoes, potatoes, oats, grasses, wheat) associated with water-stable aggregates where NPK fertilizer has been applied.

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, Lincoln.

Power Sampler for Frozen Soil
A sampler is described which will cut and extract intact frozen soil cores 1.87 inches in diameter and 18 inches long.
A. W. KRUMBACH, JR., Southern Forest Exp. Sta. FS, USDA.

A Rack for Holding and Shaking Separatory Funnels
Plans and specifications are given for racks which have been used successfully both for bench holders of separatory funnels and for mounting separatory funnels in an inverted position on a vertical type shaker.
L. C. BOAWN, ARS, USDA, Proser, Wash.
SOIL SCI. SOC. AM. PROC. 26:208. 1962.

Effect of Organic Additions on the Changes in Exchangeable Potassium Observed on Drying Soils
A Marshall subsoil that released 183 ppm K and allowed 99 ppm K to revert while using vice soil from a field-moist state and rewet, respectively, was treated with organic materials and oven-dried. By this treatment the release of K was precluded and the reversion of K was increased to 165 ppm.
A. D. SCOTT and T. E. BATES, Iowa State University, Ames.