PERMEABILITY of soil is its capacity to transmit water and air. For a program of soil and water conservation, no soil factor is of greater importance. Realizing this importance, as well as the lack of specific information in Virginia, the Virginia Experiment Station and the Soil Conservation Service, U. S. Dept. of Agriculture, in 1945 started cooperative studies of soil permeability as part of a drainage project with certain objectives in mind:

A. To determine the relative permeabilities of certain soils in Virginia upon which water relationships are important.
B. To study and evaluate the relative success of existing drainage installations.
C. To compare and correlate the permeability data with effectiveness of drainage found in the existent systems.
D. To design new drainage systems on the basis of information secured in the study outlined above.

In the beginning, work was done in areas needing drainage, but it was soon realized that a full knowledge of soil permeability had an application in other phases of the conservation program. The growth of plants is affected, for permeability to a large extent determines depth of root penetration, time required for the soil to warm up in the spring, biological activity, and nitrate formation. Water behavior in the soil must be considered in planning all types of structures for soil and water conservation.

To date approximately 275 sites, including about 750 horizons, have been sampled and studied. This is a progress report in the use and application of the information from laboratory results and field observations, with extension to conservation survey mapping throughout the State.

LAND CLASSIFICATION

The classification of land for conservation is based on the characteristics that are significant in defining its use and treatment. Soil mapping units are rated on the bases of effective depth, surface texture, permeability of subsoil and substratum. Other characteristics such as slope, erosion, overflow, wetness, materials, moisture capacity, and reaction, are described wherever they are significant in the treatment of the land.

The functional classification of soils described requires information about the permeability. Each conservation surveyor needs to recognize, within limits, the permeabilities he finds in the field.

Practical application of permeability information to field operations of soil and water conservation requires:

1. an appreciation of its importance,
2. uniform understanding of the terms in which it is defined,
3. a means by which it can be recognized and evaluated in the field.

It was originally believed that the results of determinations could be correlated with soil types, but it was soon found that wide variations occurred within previously recognized types. It was, therefore, necessary for full understanding and practical application of permeability information to specific problems. In 1947, A. M. O’Neal discovered a correlation between permeability and readily observable characteristics. He observed that structure, including the ratio between vertical and horizontal axis length, direction and amount of overlap, was generally the most significant clue. Texture and mottling, while less reliable, are significant in some soils durability of...