SOME FACTORS WHICH MODIFY THE RATE AND TOTAL AMOUNT OF INFILTRATION OF FIELD SOILS

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It has been shown that the relative amount of surface run-off which occurs following precipitation is dominantly affected by the amount of infiltration into the soil profile. Many different factors affect both the infiltration rate and the total amount of infiltration.

The purpose of the study reported herein has been to determine quantitatively the effects of several of the more important of these factors. Particular interest centered in the porosity of the profile, the effect of soil moisture, and the effect of vegetative cover, since these factors are subjected to wide variation in practice, and also since the indicated effects are of large magnitude.

DISCUSSION OF LITERATURE

Bennett (2) presented data obtained from plats at some of the soil erosion experiment stations which proved that close vegetation is very effective in reducing erosion and run-off.

Duley and Miller (4) reported that run-off losses from an uncultivated plat, a plat plowed 4 inches deep, and a plat plowed 8 inches deep over a 6-year period were 49%, 31%, and 28%, respectively of total rainfall.

Slater and Byers (13) showed marked differences in the percolation rates of short open end columns of different soil series. They stated that large numbers of cores should be obtained in attempting to fix field-percolation rates by this method alone because of the wide variation obtained from cores of the same soil.

Auten (1) compared forest and prairie soils from the standpoint of water absorption and reported a much greater capacity for the former soil together with a lower volume weight.

Lowdermilk (7) showed that the effect of forest litter in increasing absorption of water was largely caused by the filtering action of this cover.

Powers (12) found that air pressure or suction applied to a cylinder of oils produced a marked effect on percolation. He also gave the percolation rates for samples of Chehalis loam and Williamette silty clay loam, that of the latter soil being decidedly lower than that of the former. Volume weights were not given.

Buehrer (3) investigated soil structure using equipment to measure the rate of flow of air through soil columns. He reported that the relation of the "structure constant" and porosity was not linear. He also gave the volume rate of air flow for various mixtures of coarse sand and clay, coarse sand and silt, and coarse sand and very fine sand. In all cases the rate was lower for a mixture than for the coarse sand alone, a small amount of the finer material decreasing the rate by a large amount.

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3Figures in parenthesis refer to "Literature Cited", p. 739.

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