Infiltration of water into soil is related to irrigation methods, to erosion control, and to water-spraying.

In recent studies of infiltration of water into soils of Northwestern United States, attention has been given to the various factors involved. Major use has been made of the ring or cylinder method of study. Lysimeter studies and measurements of losses from small erosion plots and irrigation basins have been found useful. At this time an attempt will be made to group and chart the factors previously reported in an orderly concise way and then to discuss briefly some factors encountered and studied which do not seem to have been previously reported or investigated. As is true in any rapidly expanding field of study there is some confusion as to causes and effects and their relative sequence. Rate of entrance of water at the soil surface or infiltration should be distinguished from ultimate rate of movement through a wet soil mass, which may be designated as percolation.

In the following chart it has seemed logical to make the major distinction between, (a) those factors influencing the infiltration capacity at a given time and point and (b) those influencing the average infiltration capacity over a considerable area and period of time. The present discussion will be devoted chiefly to the first group.

The flow of any fluid is governed by three elements. These are (1) the cross-sectional area and character of the channel through which the flow takes place; (2) the energy gradient under which flow takes place, and, (3) the viscosity of the fluid. Translated into terms of soil and water, these three elements are the soil pores, the hydraulic gradient, and the viscosity of water, and these are influenced by many factors, some of which have been studied in considerable detail and others only indirectly. The numbers under the different factors in the outline indicate the items in the list of references in which studies of those factors have been reported. The chart was proposed by M. R. Lewis.

It would be difficult to list factors affecting rate of infiltration in the order of their importance. Almost any one factor may be of controlling importance in a given case. The list of factors is incomplete. Aside from conditions at the soil surface, the soil depth, substrata, and under-drainage conditions become increasingly important with duration of tests.

Some factors which have been recognized at the Oregon Agricultural Experiment Station as of importance in their effect on infiltration have been studied using six-inch rings and results will now be briefly reviewed; Table 1: Depth of penetration of water was noted after tests by taking soil moisture samples.

### Soil Cover vs. Soil Type

In our studies a dozen different soil types have been included. While soils of open structure and coarser texture have been more absorptive, the effect of cover may be more important. This is based on infiltration tests with over a dozen kinds of crops upon silt loams and similar textured soils. Infiltration in native sod has been found to be more than twice the rate of that in old eroded, tilled land nearby.

### Effect of Soil Temperature

Ice water, tap water, and hot water having temperatures of approximately 33, 66, and 99 degrees F. were used in parallel series of rings to learn the effect of water temperature on infiltration into Willamette silt loam. Hot water was found to be absorbed most rapidly until the first four inches had entered the soil. Swelling of colloids and perhaps dispersion was promoted by the hot

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1. Contribution from the Bureau of Agricultural Engineering, U. S. Dept. of Agriculture, and the Department of Soils, Oregon Agricultural Experiment Station, Corvallis, Ore. Published as Technical Paper No. 302, with the approval of the Director of the Oregon Agricultural Experiment Station.
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