



THIS IS THE USDA lysimeter as seen from the top. The same crop rotation and soil management practices are used on this 1/500 acre plot as on the surrounding field. The scales and other measuring devices are all underground. (U.S.D.A. Photo)

65 Ton Block of Earth Weighed Each 10 Minutes by Soil Scientists

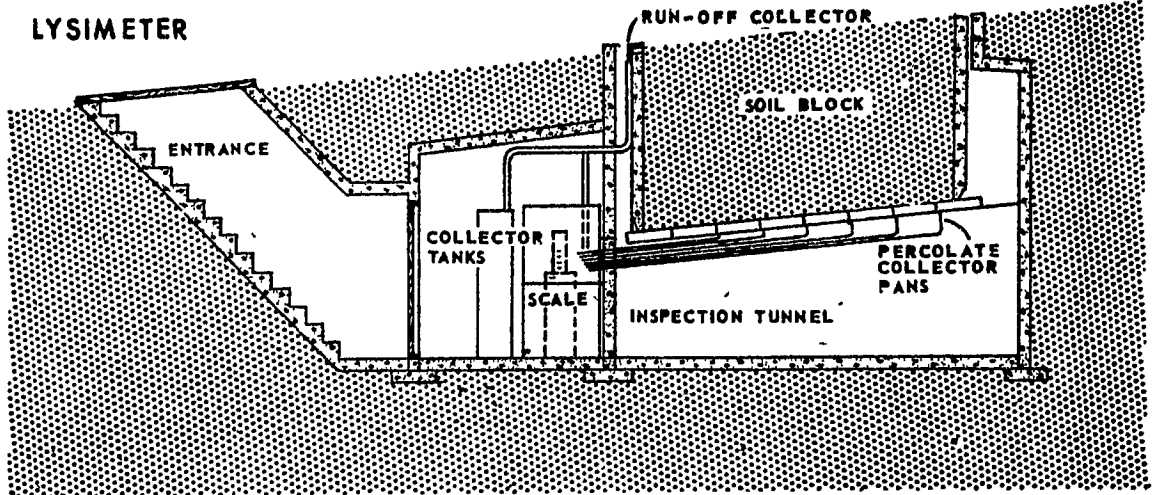
A 65-ton test plot, resting on its own giant scales, is telling U. S. Department of Agriculture scientists a great deal about what happens to water after it falls to earth.

This 1/500-acre block of earth, known as a lysimeter, is used at the Watershed Hydrology Station near Coshocton, Ohio, operated by USDA's Agricultural Research Service. It is yielding valuable information on where water goes,

what it does to soils, and how crops use it.

To the casual observer the lysimeter appears to be just a plot of earth about six feet wide and 14 feet long bordered on all sides by narrow, ground-level concrete walls. But a closer look reveals that the walls go 8 feet into the ground. Earth beneath the block has been cut away to make room for highly sensitive scales and other measuring equipment, with

LYSIMETER



CONSTRUCTION OF the 65-ton block of earth, called a lysimeter, used in soil-water studies at USDA'S Watershed Hydrology Station, Coshocton, Ohio, is shown in this drawing. The underground

scales and other measuring devices measure water runoff, infiltration, and percolation, as well as loss of water by evaporation and transpiration.

(U.S.D.A. Photo.)

plenty of space for technicians to take readings.

The soil in the block is undisturbed except for the cutting around and beneath it. Its surface is level with the surrounding field. Information from this lysimeter is representative of the entire field, on which crops are grown in a typical four-year rotation.

Year in and year out the weight of the huge chunk of earth is automatically recorded every 10 minutes, accurately measuring the lightest dew or the heaviest rainfall.

The scales and the collecting containers measure water runoff and infiltration (water absorbed into the soil), as well as percolation (drainage of water below the root zone). Also measured by subtraction, is the loss of water from the ground and plants by evapora-

tion and transpiration (release of water from the plant leaf pores). Tests of water drained into the collecting tanks underground tell how much of various nutrients percolate through.

Among other things, the lysimeter has shown the importance of moisture condensed from the air — about 2.5 tons per acre on an average summer evening — which totals over six inches in a year. Tests showed that in August 1951 at the Station, dew supplied three times as much moisture as rainfall.

With the lysimeter it is possible to relate land-management practices to moisture conservation and use. USDA scientists at the station found, on a small watershed planted to corn, that contour farming slows down the runoff from a rain, so that the soil can take in more water. In another

test on a watershed they found that applying a manure mulch to a cornfield following the first cultivation resulted in a three-fold increase in the water stored in the topsoil. The lysimeter studies, used with field studies on watersheds, show how and why these treatments effect the disposal of water.

The Coshocton records show that of Ohio's average 38 inches of rainfall, 13 inches ordinarily go by surface runoff or by soil percolation into the stream flow, and 25 inches go into the air by evapo-transpiration from soil and plants.

USDA scientists continue to analyze information obtained from the lysimeter in order to widen the application of test results. Their studies are aimed at developing ways of helping the soil make better use of water.

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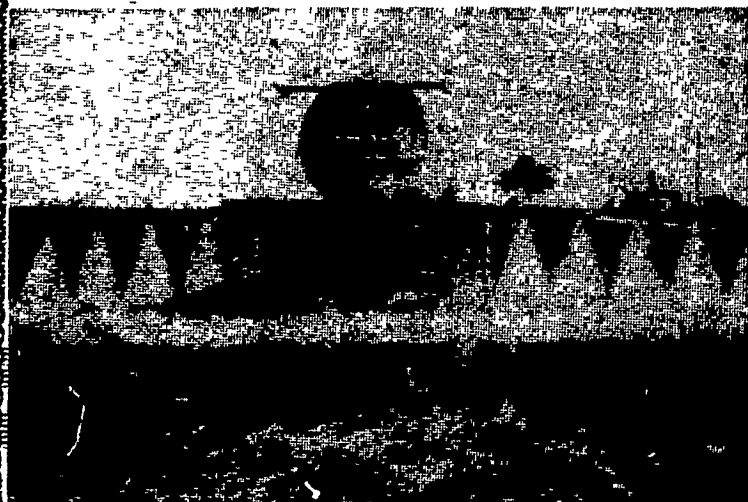
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