THE MOISTURE-SAVING EFFICIENCY OF LEVEL TERRACES UNDER SEMI-ARID CONDITIONS

H. H. FINNELL

Studies (3) of the disposition of water on silty clay loam soil under an average annual rainfall of 17.28 inches at Goodwell, Oklahoma, show a small average runoff of 2.33 inches. This may result partly as uneven field distribution and partly as loss from the field into adjacent drainage basins, but there is liability of occasional heavy losses depending mainly on the character of the rainfall.

The relatively low efficiency of the rainfall as a whole, due to slow absorption by heavy soils and to a high rate of evaporation from heat, high winds, and low humidity, places agricultural production very often in an uncertain state. It has been frequently observed that the liberation of plant food in fertile soils outdistanced the moisture supply so that only small or no yields resulted in spite of a fertility condition capable of high production. In such cases apparently small differences in moisture supply have meant comparatively large differences in yields.

Chilcott’s (1) conclusion that, “the limitation of crop yield (in the Great Plains area) is most frequently due to the operation of one or of several inhibiting factors other than shortage of rainfall,” is perfectly founded, but excites some curiosity as to just what these inhibiting factors may be. It is hard for the Plains farmer to see repeatedly what is manifestly drouth injury to the crops and not send up a cry for more rainfall. Since better use of the same rainfall would have the same effect as an increased amount, it is a pertinent fact that under some conditions as much as four-fifths of the rainfall never reaches the subsurface and subsoils where it may be drawn upon by crops. In such cases additional rainfall is much less needed than agricultural practices which make more efficient use of that which falls.

DISPOSITION OF RAINFALL WATER

The normal disposition of rainfall as calculated from recent experiments (3) on the basis of a 17-year record is shown in the first part of Table 1. A profitable agriculture has been developed under these conditions, but it is generally conceded that a more rapid use

1Contribution from the Panhandle Agricultural Experiment Station, Goodwell, Oklahoma. Paper read at the annual meeting of the Society held in Chicago, Ill., November 15, 1929.

2Director and Agronomist.

3Reference by number is to “Literature Cited,” p. 529.