THE EFFECT OF ALFALFA ON SOIL MOISTURE

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In the sub-humid section of the United States reseeding old alfalfa fields immediately to the same crop often results in failure. Some have thought that these failures were due primarily to a depletion of the soil moisture by the previous alfalfa crop, and that if the land be used for other crops for a few years enough moisture will be accumulated to support again a normal growth of alfalfa. Studies relating to this question are being conducted at the Kansas Experiment Station, and it seems desirable to present at this time a preliminary report covering the results of three seasons' work.

EXPERIMENTAL METHODS

The studies reported here were pursued as a part of the rotation and fertility experiments that have been in progress since 1910 on the agronomy farm of the Kansas Agricultural College. The soil is gently rolling upland. One series of plats (Series X) has been in alfalfa continuously since 1910, except that it was reseeded in 1923 and again in 1928. Plats 2, 11, and 12 of this series have been used for moisture determinations. These particular plats were chosen because they are located at slightly different elevations on the slope, but since the moisture contents proved to be very similar average results only are presented. Plats 2 and 11 have received no soil treatment, but plat 12 has had applications of manure and lime.

Four other plats (plat 1 of series I, II, III, and IV) which are in a 16-year rotation including alfalfa, corn, and wheat two years have also been used. In this rotation the plats are in alfalfa four years after which there is grown one crop of corn and two of wheat successively for a period of 12 years, and then reseeded to alfalfa. Series I was in alfalfa from 1922 to 1925, inclusive; series II from 1910 to 1913 and from 1926 to 1928; series III from 1918 to 1921; and series IV from 1914 to 1917. These plats have had annual applications of superphosphate. All of the rotation plats used in this study are near together, being separated only by a cross roadway. Also they are in the same field as are those continuously in alfalfa, but separated by about 600 feet and are at a slightly greater elevation.

Samples of soil for moisture determinations were taken in foot sections with a soil sampling tube to a depth of 10 feet. Duplicate samples were taken from each plat. The sampling was begun on the

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