PERSISTENCE OF SOIL DIFFERENCES WITH RESPECT TO PRODUCTIVITY

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In recent years there has been a tendency among agronomists to inquire more carefully into soil heterogeneity in connection with laying out more or less permanent experiment plats. In most crop rotation or fertilizer studies carried out on field plats the treatment and cropping plan for each plat are determined at the beginning of the experiment and remain the same for a period of years, hence the only opportunity for taking care of natural differences in soil productivity is at the time the plats are located.

In some instances this has been done by more or less systematically repeating the same crop and treatments, i.e., by plat replication. Another device which has been used frequently is the check plat. The checks have been distributed in various ways and several methods have been suggested for making corrections for soil heterogeneity based on the checks. Few field experiments have been planned on areas previously analyzed for soil heterogeneity by determining crop yields. An attempt to do this was reported from the West Virginia Agricultural Experiment Station a few years ago.

In this study two uniformity crops, oats and wheat, were harvested from each of 270 plats of approximately 1/51 of an acre net, and the yields determined. These plats are located on Wheeling fine sandy loam. The correlations between the yields of contiguous plats showed plainly that considerable soil heterogeneity existed on this tract. Moreover, the inter-annual correlation between the yield of oats in 1923 and the yield of wheat in 1924 showed a persistence of differences in productivity between plats.

The persistence of differences in productivity between plats was pointed out by Harris and Scofield in 1920. In this study all the plats were occupied by the same crop and given the same treatment. A question of importance is, will the natural variation in soil productivity among plats as revealed by a crop uniformity test persist...