EFFECT OF FERTILIZERS ON THE YIELD OF COTTON AND ON THE CONTROL OF THE ROOT-ROT DISEASE OF COTTON ON THE BLACKLAND PRAIRIE SOILS OF TEXAS

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The soils of the Blackland Prairie in Texas, consisting mostly of the Houston black clay and Houston clay, are the well-known "black waxy" soils of the state. These are extensive and important agricultural soils, occupying an area of about 11,000,000 acres. The Houston soils are naturally productive. When first put into cultivation about 1865, it was commonly believed that the soils were practically inexhaustible. It is generally known, however, that they are not so productive now as they were when first brought into cultivation. The average yield of cotton in the region has declined from 226 pounds per acre for the 10-year period 1866-75 to 135 pounds per acre for the 10 years 1916-25. This decline in productiveness has been ascribed to various causes, including depletion of plant food, soil erosion, and insects and diseases which are favored by the almost continuous growing of cotton in the region.

The cotton root-rot disease, caused by the fungus Phymatotrichum omnivorum (Shear) Duggar, is the most destructive disease of cotton and no doubt has been one of the factors in reducing the yield. The annual losses from this disease have been estimated at 10 to 15% of the total cotton crop in Texas.

Although the average yield of cotton in the Blackland Prairie has declined sharply since 1870, the results obtained at Texas Substation No. 5, Temple, have shown that proper rotations will help maintain the yield of cotton. Fertilizers had been tried in a small way by the Experiment Station and by farmers in the region, but in general the use of fertilizers was not profitable.

Since the yield of cotton had declined to such a low level and since the root-rot disease had become so prevalent and destructive, it became imperative to try to develop methods or practices that could be used profitably in increasing the yield of cotton under root-rot conditions. Although fertilizers had not given consistently good results, it was thought that a large number of cooperative experiments with fertilizers with farmers in the region would give some valuable information on the use of fertilizers.

Accordingly, cooperative experiments with fertilizers were begun in 1930 with the view of increasing the yield of cotton by (1) hastening maturity, (2) evading or controlling root-rot, or (3) by a combination

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