THE EFFECT OF CALCIUM ARSENATE UPON THE YIELD OF COTTON ON DIFFERENT SOIL TYPES

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In recent years the demand for insect control has made it necessary to apply relatively large amounts of arsenates to certain crops. This is particularly true in the South where dusting cotton with calcium arsenate for boll weevil control has become an important practice. Most of the applied arsenic reaches the soil, and some recent investigations have indicated that accumulated arsenic greatly reduces the productivity of certain soils.

In South Carolina, Cooper, et al (3) found that coarse-textured soils, such as Norfolk and Durham, were seriously affected. Applications of only 50 pounds of calcium arsenate per acre greatly reduced the yield of cotton on Durham coarse sandy loam. The fine-textured dark-colored soils, such as Greenville, Cecil, and Davidson, were not seriously affected by arsenate applications commonly used to combat boll weevil. In Louisiana, Reed and Sturgis (8) found no detrimental effect upon cotton production but obtained a toxic effect upon rice following cotton dusted with calcium arsenate. The toxicity was greater in Crawley very fine sandy loam than in Crawley silty clay loam. Craft (4), investigating the use of trivalent arsenic for soil sterilization, found soil toxicity greatest in Fresno, a sandy loam, and least in Yolo, a clay loam.

As commonly practiced in the cotton-growing area, there is no regularity in the application of calcium arsenate, either in quantity applied or frequency of applications. The quantity applied per acre at each application may vary from 3 to 10 pounds, depending upon the size of the cotton, and the number of applications in a given season may vary from one to six.

However, the quantity of calcium arsenate which finds its way into the soil is not as great as might be expected. It probably will not exceed 30 pounds per acre annually over a period of years, even on well-managed farms in areas of intense cotton production.

The increasing use of arsenical compounds for insect control, the possibility of conditions necessitating larger applications, and the likelihood of an accumulative effect from calcium arsenate seem to require more exact knowledge. It is the purpose of this paper to show the effect of calcium arsenate treatments upon the cotton yields from several important soil types.

EXPERIMENTAL

SOILS

Used in this study were three upland soils, Memphis silt loam at Holly Springs, Mississippi, Houston clay loam at West Point, Mississippi, and Ruston sandy