SOIL variation in the irrigated sections of New Mexico creates a great problem in the production of cotton with fiber of uniformly high quality. It is commonly known by farmers that land of poor fertility produces cotton of poor quality. Reynolds and Killough (3) reported that the application of potash tended to reduce the length of fiber and that rainfall was positively correlated with length of lint at College Station, Texas. Vilbrandt and Murphy (6) state that fibers of cotton grown on light land or badly washed land were $\frac{1}{16}$ inch to $\frac{5}{8}$ inch shorter than those of cotton grown on stiff land. Work by Bartholomew and Janssen (1) indicated that fertilizers may increase the size of the boll as well as the number of bolls.

From this report it will be noted that, along with yield, the length and uniformity of the fiber are affected by variation of soil, as shown by different placements of plats.

**MATERIALS AND METHODS**

In the regular progeny test block at the New Mexico Experiment Station each tenth row is planted to College Acala, the variety commonly grown in New Mexico. Only 8 of these rows in 1933, 7 in 1934, and 10 in 1935 were used to obtain the character percentage of $\frac{1}{4}$-plus fibers; therefore, the data herein reported are on these checks only. The characters used in addition to percentage $\frac{1}{4}$-plus fibers are calculated yield and the classer's length.

The calculated yield was obtained by multiplying the number of bolls per plant by the weight per boll and is recorded in grams of lint per plant. The classer's length is the length after ginning, as classed by the El Paso office of the Bureau of Agricultural Economics, U. S. Dept. of Agriculture. The percentage of $\frac{1}{4}$-plus fibers is the percentage by weight of the fibers that are $\frac{1}{4}$ inches or longer, according to the fiber sorter data. These characters have been described in detail in a previous publication (5).

The check rows used in 1933 and 1934 were random rows located at various places within the field, but in 1935, while they were random rows, they covered the field from one side to the other. They were planted to the same seed and given the same treatments as to irrigations, cultivations, and spacing. The spacing was one plant per hill with 20 inches between hills.

The analysis of variance and covariance is according to Fisher (2) and Snedecor (4). The first 10 plants in regular order of each check row were used in computing these data.

**THE DATA**

The sum of squares and the mean squares for total, between means of rows, and within rows are shown for 1933 in Table 1; for 1934, in Table 2; and for 1935, in Table 3; where A is yield in grams per plant,

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