DEGENERATION WITHIN COTTON VARIETIES

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THAT seed supplies of improved cotton varieties distributed by breeders are not pure lines is generally known. That such seed stocks degenerate, that is, in some way undergo undesirable changes as they are grown year after year, is generally claimed by practical cotton producers. Much of this degeneration has been justly attributed to cross pollination at flowering time and mechanical mixing with other seed stocks at gins, in places of storage, and in other ways.

It is not generally agreed among cotton research workers that improved cotton seed stocks will degenerate materially if cross pollination and mechanical mixing are prevented. It appears obvious that if a cotton variety were a pure line and if harmful mutations did not occur, there would be no degeneration of this kind. It is almost equally obvious that degeneration of this kind must be relatively slight since the combined degeneration from all sources is sometimes difficult to measure from year to year in field trials. This project was undertaken to determine if such degeneration does occur, the nature and rapidity of such degeneration, and to compare two methods of maintenance. That portion of the data covering changes which affect the production, yield, and harvesting of the crop are presented in this report.

PLAN OF THE EXPERIMENT

Five varieties were selected for this study and were continued until the last year (1940) when one was dropped and only four were tested. These varieties, under average conditions, covered a range in staple length from a short \( \frac{3}{8} \) inch to a full \( \frac{11}{8} \) inch. Because of the problems of isolation and acreage necessary for increase, it was not possible to include varieties representing all of the most widely grown types. The varieties were chosen, therefore, on the basis of origin. The group included two varieties of recent hybrid origin. A third variety had been developed from a cross made 15 years previously and had been thrown back repeatedly to a single plant until the type was reasonably uniform. The other two varieties had not had any known hybridization for more than 25 years.

Since the beginning of this work, three of these varieties have been discontinued by the originators. The other two are still being maintained and are being used by farmers to some extent. It is not believed that these results would receive added value by disclosing the identity of the varieties used. They will, therefore, be referred to by number and are briefly described in Table 1. The word "selection" as used in this tabulation indicates that there had been no known hybridization for more than 10 years.

In this report the terms "breeder" generation and "farmer" generation are used. The first, second, and third breeder generations imply that seed of the second has had one more year of attention from the breeder than the third and, likewise, that seed of the first has had one more year of attention from the breeder than the