The Effects of Certain Mechanical Mixtures on the Spinning Quality of Lint Cotton

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During the past two decades the development and use of instruments for measuring cotton fiber properties which affect spinning performance have served to establish varietal differences much more clearly than was possible by the old methods. The variety has thus emerged, more fully than ever before, as a factor to be considered when mill purchases are made.

If mill buyers are to express a preference for the lint of some particular variety, they must be provided with some assurance as to the identity of the variety. This is relatively easy where only one variety is grown on a farm and ginned on a gin. The problem is much more complex where several varieties are ginned on the same gin. Mechanical mixing of lint and seed must be reckoned with.

It is a fact, however, that in the processing of lint cotton, mills often practice "blending." This may be done to improve the uniformity of the lots being processed or it may be done to reduce cost as, for example, mixing a low-grade cotton with a higher grade. If then, the processor can mix two or more different varieties or lots of cotton with a resulting satisfactory product, how much mixing of a particular variety with others, at the gin and in the field, can occur without affecting the processing characteristics of the variety? The answer, obviously, will vary with the dissimilarity in the processing characteristics of the varieties being mixed and with the exactness required by the processor.

Opinions concerning the spinning performance of varietal and other mixtures vary a great deal. Ramiah and Panse (1) reported that the commercial "Malwa" cotton was a stable mixture of old and new world species and that certain of the mixtures produced lint of superior spinning quality. Richmond and Lewis (3) studied the yield and some of the fiber properties of varietal mixtures and their pure stock components. They reported that some mixtures gave increases in lint strength which were significant at the P 0.05 level over their pure stock components. They did not report spinning data.

Regnery (2) obtained more than 3000 bales of cotton, mostly Deltapine 14 with some Stoneville 2B, from the Mississippi Delta for making window-shade cloth. He found that the fiber of the individual bales of this lot of cotton varied so much in fineness that day to day mill operations could be greatly improved by sorting into fineness groups and blending these different lots so that the lint from day to day was of about the same average fineness. This reduced variations in spinning and in the spinning and card room operations. It is evident from the work of Ramiah and Panse referred to above, this is in some indication that the standard of operational precision required here was greater than might have been found in the work of Ramiah and Panse referred to above.

Regnery (2) concluded further that the advantage in buying cotton either by variety or locality may not, however, indicate how the varietal identity of the cotton he purchased was verified.

The trials reported here were undertaken with the object of determining at least partially what is the result of the planting of mechanically mixed lint mixtures due to seed roll residues.

METHODS AND MATERIALS

There were two groups of tests in the mechanical mixtures, and in these, the seed of two varieties was mixed in known and varying proportions before planting. The first group of trials (1947) and in the study of seed used in the trials. Cleveland and Wilds were used. The lint produced by these varieties differs greatly. Cleveland produces a weak, short, and fine fiber while the fiber produced by Wilds is quite long, and fine. In the second group (1950 and 1951) Deltapine 15 and Empire were used. While the fiber of these two varieties usually does not differ greatly, it differs as much as that produced by any two other varieties adapted to and widely grown in the central part of Mississippi. The lint of Empire is a little shorter and coarser in appearance than the lint of Deltapine.

The production of lint from these seed mixtures was handled in much the same way as a test comparing varieties. Single-row plots about 100 feet in length and six randomized replications. After the yield weights were recorded, seed cotton from each individual plot was placed in a burlap bag and properly identified as to plot, mixture, and replication. This material was stored and later ginned to provide material for the spinning laboratory.

The lint samples were prepared on a 20-saw gin by number, packed in a small bale, and shipped to the laboratory at College Station, Tex. There they were spun by the long draft process. The yarn numbers were 36S, 40S, 56S, and 60S.

When seed of two varieties is mixed in certain proportions before planting, it is not reasonable to expect that the proportion of fiber retained for production, after cultivating and thinning, will be exactly in that proportion. If the varieties produce unequally, the proportion of lint in the mixture may be changed further and, with different varieties, it is obvious that the proportion of lint in the mixture may not be the same as the proportion of seed in the mixture. Blending the lint of the two varieties at the gin in the field in those proportions wanted was not done because of process