

**CROP QUALITY -
A DECADE OF IMPROVEMENT**
Preston E. Sasser & Jennifer L. Shane
Cotton Incorporated
Raleigh, NC

Abstract

Over the last decade, the average strength of U.S. upland cotton has increased 3.4 grams/tex, the average staple length has increased about three-fourths of 1/32 inch, the average length uniformity index has increased nearly one index unit and the percent of white grades in the crop has increased over 20 percent.

Introduction

The quality of U.S. upland cotton has significantly improved during the last decade. The improvements are the result of growers planting varieties that produce higher quality fiber, and using better production, harvesting and ginning practices. Quality improvement can also be attributed to the use of instruments to measure the quality of each crop.

This paper will examine the trends in the quality of U.S. upland cotton during the last decade (Crop Years 1985 through 1995). All data used in this report are from published USDA, AMS, Cotton Division reports. Quality data on the 1995 crops are for cotton classed through 22 December 1995.

Strength

The story of how fiber strength has increased in the U.S. upland is an outstanding demonstration of cotton producers improving the quality of their product. This improvement in fiber strength has allowed textile manufacturers to make stronger yarns at higher production rates. It is supporting the strong consumer move to wrinkle resistant apparel.

Figure 1 shows the increase in the average strength of each U.S. upland crop since 1985. The 1995 crop average of 29.1 grams/tex (although not yet a final number) is likely to set a record for high strength for a U.S. upland crop. Since 1985, the average strength has been increasing at the rate of 0.34 grams/tex per year.

Figure 2 gives the average HVI fiber strength for each cotton growing state. You will note from the graph that every state but California and Texas has increased strength in 1995 compared to 1994. (No state averages were available for Virginia and Florida.)

Staple Length

If we look at only the slopes of the regression lines for the length and strength crop data over the last decade, we might conclude that both of these quality factors have been steadily increasing that time period. However, while fiber strength has been consistently increasing year-by-year, the length has a different growth pattern. During crop years 1985 through 1990, the crop had an average staple length of 34.6/32 inch (1.08 inch). Then in the 1990's the staple length moved to a higher plateau (See Figure 3). In the period 1991 through the current crop the average staple length has an overall average of 35.1/32 inch (1.10 inch). During each of these time periods (1985-1990 and 1991-1996) the average staple length actually decreased slightly. What happened between the 1990 crop and the 1991 crop to set staple length on a different level? The only apparent thing is that the USDA went to 100% instrument testing of length in 1991. During the late 1980's, testing of the crop by instruments was on a voluntary basis for producers and about half of the crop was instrument tested with the other half of the crop was stapled by human classers. Could this be the difference?

Figure 3 gives the average staple length of each crop since 1985. The 1991 and 1992 crops have the longest staple length on record. The 1995 crop will average 35/32 inch (1.09 inch) in length. No cotton growing state has a higher average staple length in its 1995 crop than it had in 1994.

Length Uniformity Index

Figure 4 gives the average U.S. upland crop length uniformity index (LUI) for each crop since 1987. That is the year that the USDA began reporting these data. Over that time period the LUI has increased nearly one index unit. However, as we have observed with the staple length data, the crop average for LUI has not increased since 1991. The 1993 crop has the highest LUI on record.

Micronaire

Figure 5 shows the average micronaire for each crop since 1985. The eleven-year (including the 1995 crop data) trend has been for the average micronaire of our crop to increase slightly. The graph shows that the micronaire decreased steadily during the late 1980's but since 1989, when we had an average 4.0 micronaire crop, the average micronaire has been increasing. The 1995 crop will have an average micronaire of 4.37. This will be the highest average micronaire for any crop since 1977 (when the crop average was 4.4).

The graphic in Figure 6 shows an interesting pattern for the micronaire of U.S. upland cotton. All the western states had equal or lower average micronaire values in 1995 than in 1994. However, every state east of Texas and Oklahoma

have higher micronaire averages in 1995 than in 1994. This pattern is most likely weather related.

Color Grade

The pattern of grade quality of the U.S. crop is shown in Figure 7. The graph shows the percent of the bales in the crop classed into white grades, light spotted grades and all other grades. The data show that in the late 1980's, there was a significant increase in the percentage of bales classed into white grade and a corresponding decrease in the bales classed light spotted. Since 1988, about 78% of the bales in each crop have been classed into white grades. The 1995 crop has about 77% of the bales classed into white grades. Note also that for the last three crops only a total of about 1% of U.S. upland cotton is classed into spotted, tinged, yellow stained and below grades. In figure 7, the pre-1993 data are for composite grade. Since 1993, the data are for color grade only.

Leaf Grade

Figure 8 gives the national averages for HVI Trash percent for each crop since 1990. The year-to-year changes may be due to weather patterns during the harvest time. However, it is interesting to note that the average HVI trash reading for the crop has increased each year since 1993 when the USDA separated color and trash in its classer's grade determination.

Summary

During the last decade, the quality of U.S. upland cotton has significantly improved. The average HVI strength of the crop has increased 3.4 grams/tex, the average staple length of the crop has increased about three-fourths of 1/32 inch, the average length uniformity index has increased nearly one index unit and the percent of white grades in the crop has held at a level of about 78% of the bales for most of the decade.

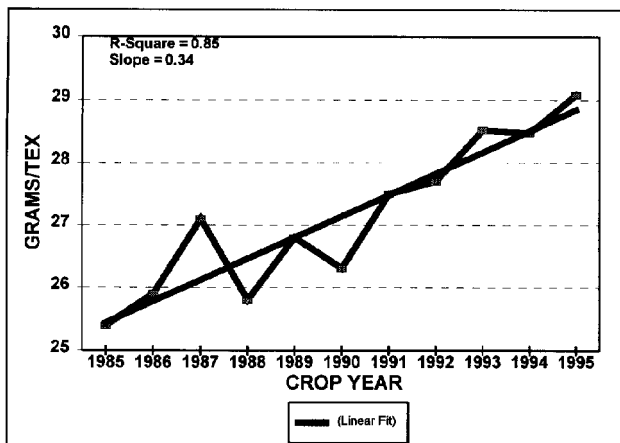


Figure 1. HVI Strength Trend, U.S. Upland Cotton, National Averages

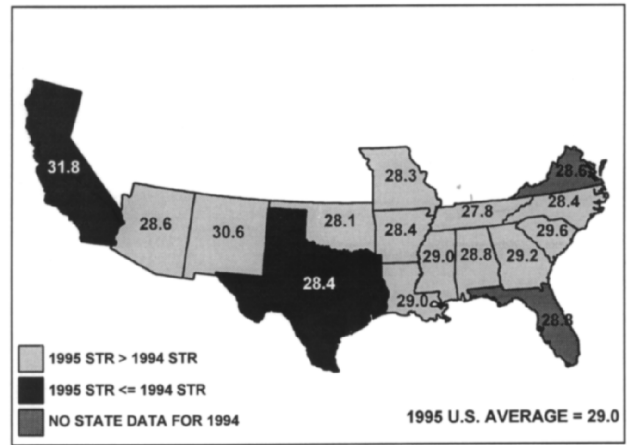


Figure 2. 1995 vs 1994 U.S. Upland Cotton, Strength In g/tex By State

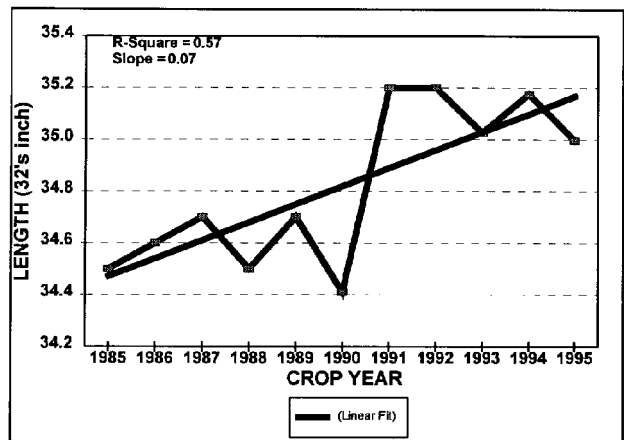


Figure 3. Staple Length Trend, U.S. Upland Cotton, National Averages

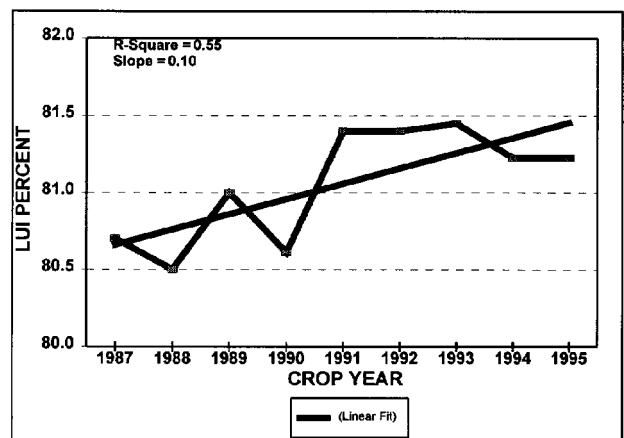


Figure 4. Length Uniformity Index Trend, U.S. Upland Cotton, National Averages

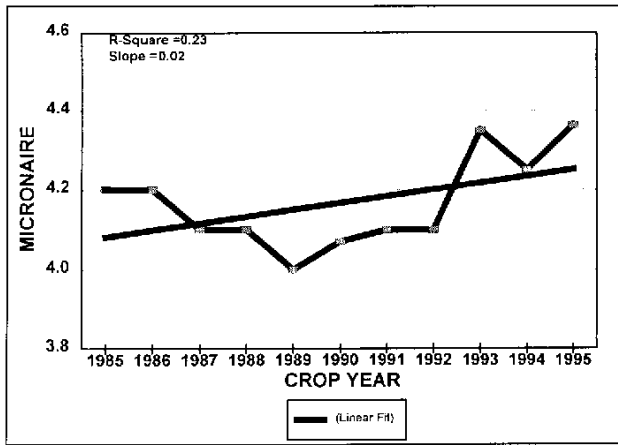


Figure 5. Micronaire Trend, U.S. Upland Cotton, National Averages

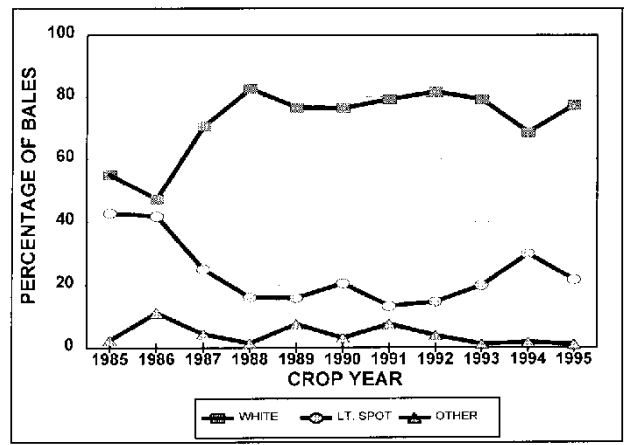


Figure 7. Color Grade Trend, U.S. Upland Cotton, National Averages

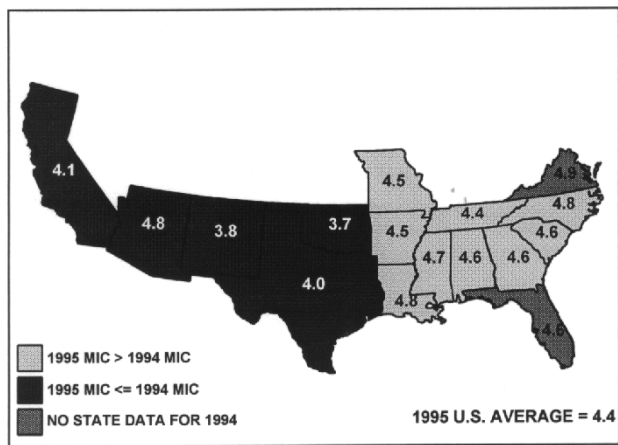


Figure 6. 1995 vs 1994 U.S. Upland Cotton, Micronaire By State