The U.S. cotton industry is known for producing some of the highest quality cotton in the world. To maintain the high standard of quality and to avoid discounts, certain practices can be implemented throughout the growing season to help deliver quality cotton to the gin.

Variety Selection and In-season Management

The most critical component for producing high quality cotton is variety selection. The genetic makeup of a variety can play a large role in fiber quality. When selecting a variety, producers should look at all fiber quality characteristics to help make a decision for their fields. Once a variety is planted the crop must be maintained throughout the growing season. Crops under less stress will produce higher quality fiber. Fiber quality is built throughout the entire growing season, and certain factors can be controlled by the producer. Production practices that should be monitored to improve cotton quality include: varietal selection, field fertility, harvest aid application, pest control, and moisture (if irrigated).

Development of Fiber Quality Characteristics

Length

To maximize fiber length, proper management and good growing conditions must be available during the elongation phase of fiber development. Fiber elongation takes place in the first 16 to 25 days after boll development. During this time, high temperatures, water stress and potassium deficiency can result in shorter fibers. Fiber length can also be affected by the ginning process. If cotton moisture is low during ginning, fiber length can be compromised due to breakage. The ideal ginning moisture range is 6 to 8%. When lint moisture is below 5%, each percentage point lower is equivalent to 1/100 of an inch reduction in length.

Strength

Fiber strength is primarily determined by the variety; however, environment can have some affect on strength. Certain cultural practices can increase or decrease the lint strength. Severe potassium deficiency can decrease lint strength and extreme weather conditions may cause physical or microbial damage to fiber, resulting in reduced strength.

Micronaire

Micronaire is defined as the size of an individual cotton fiber taken in cross-section. Fiber with micronaire ratings that are too high or too low can affect cotton quality by limiting how the fiber can be used within the textile industry. Fibers with low micronaire are typically caused by inadequate carbohydrates. Cotton fibers with low micronaire are immature or more fine (small diameter) and can easily form nep (small knots of tangled fiber) during the ginning process. Fibers with high micronaire are more coarse, which limits their textile use. High micronaire is a result of excessive carbohydrate availability during development.
Managing Cotton for Fiber Quality (continued)

In certain situations, management decisions may help producers avoid too low or too high micronaire fiber. Early termination of fiber development during the growing season can result in immature fiber with low micronaire. Consequently, variety selection and proper application timing of harvest aids are important. Defoliants and boll openers should not be applied too early to avoid reducing micronaire. Similar to fiber strength, a potassium deficiency can cause low micronaire since deficient plants will still set bolls normally and then supply an insufficient amount of carbohydrate resulting in reduced micronaire. In addition, excessive irrigation, fertilizer and high plant populations can contribute to low micronaire. Finally, moderate weather conditions may cause high boll production and retention, limiting the carbohydrates available for each boll which can also result in lower micronaire. Conversely, high micronaire can occur when extremely warm weather conditions cause severe boll shed. When only a few bolls are retained on the plant, high amounts of carbohydrates are available, which can cause higher micronaire.

Maintaining Fiber Quality During and After Harvest

Applications that aid in harvest timing can have an effect on cotton quality. Applications that delay harvest can increase the potential for poor late-season weather, which may also affect cotton quality.

Once cotton is harvested it is stored in modules placed on the edge of fields until transported to a ginning facility. To maintain fiber quality during storage, cotton must be properly defoliated prior to harvest. Vegetative material or green trash left in the cotton module can result in excess moisture content, high trash count, and stained cotton lint.

To help protect cotton during storage, modules should be covered with a module cover. Module covers should be checked for any tears or pin holes before use. Any excess moisture in the cotton can cause condensation under the cover, so modules should be monitored. When elevated moisture levels occur, temperatures increase within the module compromising lint grade and seed germination. Extreme cases can result in spontaneous combustion. Ideally, cotton harvested at correct moisture levels should only increase 10° to 15° F in the first 5 to 7 days of module storage, then level off or decrease in temperature. A 15° to 20° F temperature increase during the first 5 to 7 days can indicate a problem with high moisture and the module should be ginned as soon as possible. After the initial daily temperature check, modules should continue to be checked every 3 to 4 days. At any time during storage if a module reaches a temperature of 120° F the cotton should be ginned immediately.

Sources:

Individual results may vary, and performance may vary from location to location and from year to year. This result may not be an indicator of results you may obtain as local growing, soil and weather conditions may vary. Growers should evaluate data from multiple locations and years whenever possible.

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