

## FIBER CHARACTERISTICS - VALUE/VARIETIES

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Assessment of cotton fiber quality has undergone a significant change during the past several years. The older, traditional practice of assessing quality by color, trash and preparation has been progressively replaced by reliance on instruments that measure various physical properties of ginned lint that are not readily obtainable with hand classing. Today, cotton quality evaluation is widely based on the use of high volume instrumentation, or HVI, which is being increasingly adopted all the way from producers to textile manufacturers. In my opinion, high volume instrumentation is one of the most significant developments of recent decades in the technology of cotton development, production, marketing and utilization. HVI technology still is evolving, with expectations that components now being perfected will greatly strengthen the capabilities of HVI to precisely measure the physical properties of cotton that are important to textile processing. These are indicated in Table 1, which summarizes the past, present and future features of cotton fiber assessment.

A major impetus for the development and application of HVI testing was the need for textile mills to improve processing efficiencies, enhance the quality of their yarns and fabric products and to meet the increasingly more discriminating needs of the textile-consuming public. The advantages of HVI testing have extended to shippers, merchants, ginner and to growers. Today a

substantial portion of the world's cotton is marketed and processed with reference to HVI specifications. Hunter (1990) reported that more than 600 HVI systems were in operation in 47 countries, and he suggested that "in the not too distant future, cottons will be classed worldwide by HVI."

Although the impact of this new generation of quality evaluation may be more apparent in the case of marketing and textile processing, HVI also should be appreciated at the grower level. After all, you cotton farmers are producing a raw material for sale and for profit, and you need to be aware of your customers' needs and of what you can do to accommodate to them. This means knowing what HVI means and how to best utilize the information in making your respective crop management decisions.

So, let us consider the importance of HVI to growers ... here in Australia or elsewhere. It is generally conceded that the relative importance of fiber properties differs markedly between growers and textile interests. This situation is demonstrated in Table 2 that compares a priority list of fiber properties as perceived by textile manufacturers and cotton growers. Obviously, producers should consider educating themselves about the importance of quality characteristics needed by their customers. If you, as a grower, know the properties that are in demand in the textile trade, then you should recognize the production variables that will influence the marketability and value of your crop. I would suggest that the following few factors merit your general consideration:

1. Be discriminating in your choice of variety ... select those that have a genetic potential for acceptable yield under your environmental and

management situation.

2. Be knowledgeable of the genetic potential for quality of the varieties under consideration, and of the production variables that will promote realization of those qualities.
3. Once you have grown a crop with good yield and quality, utilize defoliation and harvesting practices that will help to retain the favorable characteristics of the crop.
4. Monitor the modeling and ginning of your crop, keeping adequate records that will enable you to associate final crop quality characteristics with crop management practices and environmental variables.
5. Develop a better understanding of why certain fiber characteristics are important in mill processing and why these properties may vary among mill customers. This point is illustrated in Table 3 which shows that quality priorities may differ, depending on spinning technology. Ring and rotor spinning presently are the dominant methods of yarn formation in the world today, with rotor spinning growing rapidly in importance. The growth of rotor yarn formation is a major reason for the increasing emphasis on fiber strength.

Now, let me speak more specifically to the matter of variety. I remind you that potential performance of a variety, be it in respect to yield, pest resistance, earliness, fiber quality, etc., is established by the genetic makeup of that variety. How fully this potential is achieved is influenced by the environment under which the variety is grown. Cotton producers in Australia are fortunate

in having at their disposal a number of varieties that fit into various production schemes and that provide a diversity of fiber quality. Your breeders have been very successful in developing varieties that possess greater potential for yield, fiber quality, pest resistance, earliness and other economic characteristics. I was especially impressed by a paper delivered by Dr. Greg Constable in Nashville, Tennessee in January 1992. I have borrowed one of his figures (Figure 1) to illustrate the progress that has been made in improvement of yield level and fiber strength in Australia-bred varieties. The relative improvement of lint yield is impressive in itself, especially because it has been achieved in only ten or twelve years. Additionally impressive is the fact that fiber strength has shown a concomitant increase over the same period of time. In cotton breeding circles, we usually consider that significant improvement of fiber strength (and certain other fiber properties) without sacrifice of yield is very difficult to achieve over a short span of time.

While the varieties presently at the disposal of Australian growers are impressive, even better varieties are in various stages of development and evaluation. Certainly, lint yield will continue to be the dominant feature, but fiber quality enhancement will play a major role in selection and release of future varieties. HVI is a valuable tool for breeders to use in their continuing research program ... without it, the objective of continued quality improvement would be very difficult to satisfy.

I expect the cotton producers will find HVI to be increasingly more important in the years ahead. HVI will provide a grower with more adequate

guidelines for making management adjustments, for establishing a realistic market value for his crop and allowing for delivery of a superior raw material to customers in the highly competitive textile industry.

#### REFERENCES

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Table 1. Assessment of cotton fiber properties (Deussen 1990).

PAST	PRESENT	FUTURE
Manual Classing	HVI	HVI
Length Micronaire Grade (color and trash)	Strength Elongation Length Length uniformity Micronaire Color Trash	Strength Elongation Length Length uniformity or distribution Short fiber content Fineness Maturity Color

Table 2. Priority ranking of cotton fiber properties by textile manufacturers and growers (Meredith 1991).

Fiber Property	ITMF*	Growers
Strength	1	6
Length	2	5
Short fiber	3	7
Fineness	4	4
Maturity	5	3
Color	6	2
Trash	7	1

\*International Textile Manufacturer Federation.

Table 3. Ranking of cotton fiber properties for use in three major spinning technologies (Deussen 1989).

Ring Spinning	Rotor Spinning	Air Jet Spinning
Fiber length and length uniformity	Fiber strength	Fiber length and length uniformity
Fiber strength	Fiber fineness	Fiber fineness
Fiber fineness	Fiber length and length uniformity	Fiber strength
	Cleanliness	Fiber friction
		Cleanliness

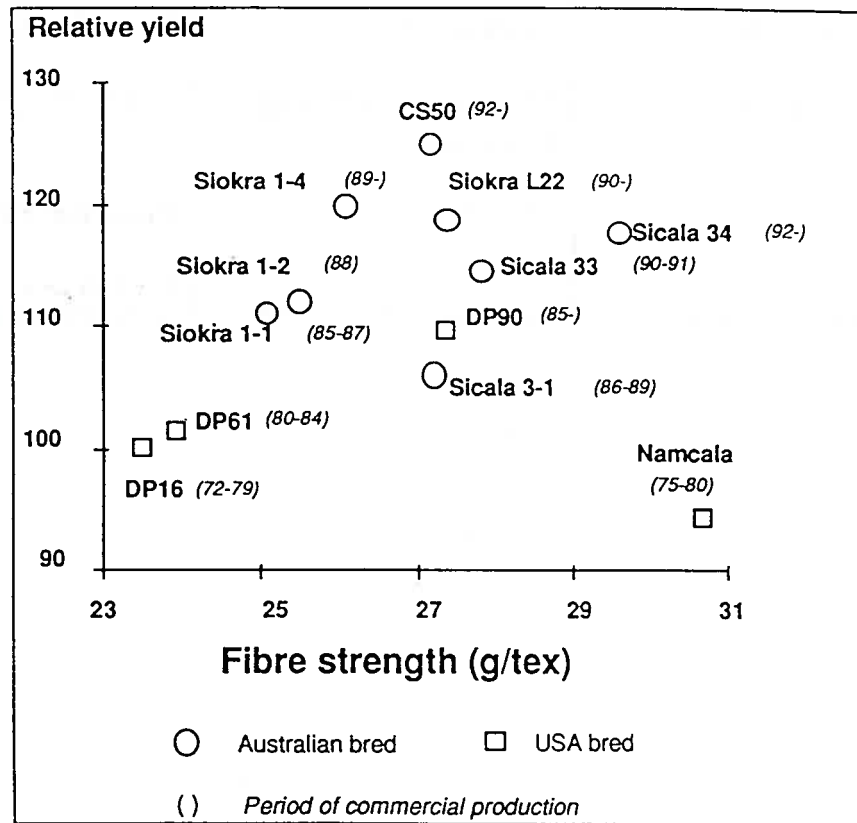


Figure 1. Improvement of lint yield and fiber strength in Australian cotton breeding program since 1984 (Constable 1992).