GINNING U.S. COTTON FOR DOMESTIC AND EXPORT MARKETS

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Abstract

The U.S. cotton crop is produced by a highly mechanized production system that seeks to minimize manual labor while maximizing fiber quality. It is estimated that a bale of U.S. cotton is produced using approximately three man hours of labor while foreign producers may utilize several hundred man hours per bale. U.S. mechanization has resulted in an increase in some ginned fiber quality problems in comparison to foreign growths that utilize hand picking and significant manual labor for processing. The majority of U.S. cotton production is exported and must compete in fiber quality with hand-picked cottons for markets. U.S. cotton competes very well in low levels of bale contamination with foreign material, accurate and reliable fiber parameter classification, integrity of the individual cotton bale, and reliability of contract fulfillment. However, American cotton receives complaints from foreign customers of lower length uniformity, increased short fiber and increased neps in comparison to hand-picked cottons. These particular quality factors are affected by the level of mechanical processing that cotton fiber receives during the harvesting and ginning process. As a result, a significant proportion of current ginning research is aimed at improving the mechanical processing of cotton to decrease the impact on baled fiber quality and making U.S. cotton more competitive in all raw fiber quality areas. This paper looks at the impact that various current U.S. ginning practices have on the quality of U.S. cottons.

Introduction

At the beginning of the 21st century about 30% of the world's cotton production was harvested by machines with only Australia, Israel, and the U.S. machine harvesting 100% of their cotton (ICAC a, 2010). Machine harvesting is increasing in some countries, such as Argentina and Brazil that are using U.S. harvesting technology, while other cotton producing countries are only just beginning to use machine harvesting or are not using it at all. Generally for cottons of identical genetic quality, there will be some cotton fiber quality factors that will be superior for that cotton that is processed through a manual harvesting and ginning system versus a completely mechanized system. Those differences will primarily occur in length properties and nep levels. Mechanized cotton harvesting and processing systems tend to do more fiber damage than do manual systems. The fiber quality goal of any mechanized cotton processing system is to maintain quality at the same levels as those in the boll. Continued and sustained research, in the U.S. in particular, has enabled mechanized cotton systems to make very good progress in achieving the fiber quality of manual systems.

All cotton fiber, whether produced by a mechanized or manual harvesting and ginning system or a combination, is marketed based on a number of quality factors. For U.S. cottons and a growing number of foreign cottons, those quality factors are based on High Volume Instrument (HVI) classing. The HVI gives a measure of fiber length, length uniformity, strength, micronaire, color reflectance (Rd), color yellowness (+b), and trash area. The human classer identifies leaf grade and any extraneous matter such as bark, grass, oil etc. These are not all the quality factors that affect the textile process, but they are the quality factors that currently govern the market price of U.S. raw cotton fiber (ICAC b, 2010). The HVI classification standards are used almost exclusively within the U.S. and are broadly accepted in the foreign marketing of upland-type cotton, especially that grown in the U.S. The standards provide a sound base for establishing market values that gain more acceptance with each year's crop. International trading disputes are settled by utilizing U.S. standards (USDA-AMS, 2010).

Historically, the majority of the cotton fiber produced in the U.S. was consumed by the U.S. textile industry with the remainder entering the world market and exported overseas. As recently as the marketing year 1999/2000, approximately 60% of the cotton produced in the U.S. was utilized by the U.S. textile industry (NCC, 2010). The U.S. textile industry has suffered a rapid decline during the past decade and for the marketing year 2009/2010, only 28% of the 12.19 million bales of cotton grown in the U.S. (3.46 million bales) was actually consumed domestically, while the rest was marketed overseas (NCC, 2010).

Establishing the value and marketing of U.S. cotton is a complex topic and is the subject of many variables other than the HVI classification of a given bale. For the purposes of this paper we will refer to "base" qualities of cotton, that is, those cottons whose quality meet the minimum demand for a particular market and not discounted in price due to being deficient in a particular fiber quality parameter. For example, the 2010 USDA-Farm Service Agency (FSA) cotton loan rates of premiums and discounts (USDA-FSA, 2010) for American upland cotton is based on grade, staple length, and leaf content. The base rate for American upland is a strict low middling (SLM) color grade 41, leaf grade 4, and staple 34. American cotton sold for domestic use would be traded on this basis and subject to market conditions, cottons of higher grade and staple would demand price premiums and those of lower grade and staple would be subject to price discounts. However, the international basis for cotton trading as indicated by the Cotlook A Index (Cotton Outlook, 2010) is a middling color grade 31, leaf grade 3, and staple 35. This means that American cotton that graded at our domestic basis would not be subject to price discount for U.S. textile mills, but would be subject to some level of price discount internationally.

For a given cotton variety, fiber length and color parameters are at their highest quality when the boll first opens, but are then subject to degradation due to weather, harvesting, and ginning conditions. Other fiber parameters such as micronaire and strength remain essentially unchanged for all practical purposes through the cotton harvesting and ginning process, while leaf grade (trash content) is affected by environmental, harvesting and ginning conditions. Cotton ginning is primarily a mechanical process whose primary impact on fiber quality as measured by the HVI is related to all of the length parameters, trash content, and apparent color. Other fiber quality parameters, such as nep content, are also affected by ginning, but are not currently measured by the HVI. According to the USDA, Agricultural Marketing Service (AMS) (USDA-AMS, 2009,) the predominant color grade, leaf grade and staple for the 2009 U.S. cotton crop was SLM 41, 3, and 35 respectively. In looking at staple length specifically, the length distribution for the 2009 crop was 6% staple length 33 or shorter, 16% staple 34, 30% staple length 35, and 48% staple length 36 or higher. This means that 94% of the U.S. cotton crop would sell on our domestic market without any discount due to staple and 78% could receive a premium for length according to the loan chart basis of 34 staple. Internationally, only 78% would sell without a discount for staple and only 48% could be subject to a premium according to the Cotlook A Index of staple 35 basis. Cotton staple lengths vary from year to year but similar statements could be made for each growing season. Premiums and discounts for staple length also vary from year to year, but since the majority of U.S. cotton is sold internationally, a difference of one staple length can significantly impact the price that U.S. cotton producers receive on the international markets.

Cotton gin plants are custom built and generally contain similar types of equipment, but the arrangement and number of those machines vary. Differences in gin design are due to the growing area and types of cotton varieties grown (irrigated or rain grown), whether stripper or picker harvested, and type of gin stand used (saw- or roller-gin). The purpose of this paper is to look at some of the effects that ginning practices across the cotton belt have on cotton quality relative to domestic and international markets and how those fiber quality effects might be changed.

Discussion

Tables 1 through 5 present fiber quality data from a survey that was done during the 2005 and 2006 crop years to assess the changes in saw ginned upland cotton quality during the ginning process and throughout the ginning season across the entire cotton belt (Whitelock et al., 2010). Table 1 shows that for these crop years there were some cottons sampled in all regions, except for the Far West, that did not meet the U.S. base 34 staple length after at least one lint cleaner. There were also cottons in all regions that exceeded both the U.S. and international basis of 34 and 35 staple, respectively, after both one and two lint cleaners.

Table 1. Staple Length Range

Region	*Before Lint Cleaning 32nds (inch)*	*One Stage Lint Cleaning 32nds (inch)*	*Two Stages Lint Cleaning 32nds (inch)*
Southeastern	34 – 37 (1.06 – 1.17)	33 – 36 (1.04 – 1.12)	
Mid-South	33 – 37 (1.03 – 1.16)	33 – 37 (1.02 – 1.15)	
Southwest	34 – 36 (1.06 – 1.12)	33 – 36 (1.04 – 1.13)	
Southwest	33 – 39 (1.04 – 1.22)		33 – 38 (1.02 – 1.19)
Far West	36 – 38 (1.12 – 1.19)	35 – 37 (1.10 – 1.16)	
Far West	37 – 41 (1.17 – 1.29)		37 – 41 (1.15 – 1.28)

Table 2 shows the average color grade of the survey cottons as percentages. Approximately 50% of all cottons sampled across the cotton belt by Whitelock, et al. (2010) met the international base color of 31 and this percentage greatly increased after either one or two lint cleaners. Color grade can be significantly affected by growing and harvest conditions and is variable due to year and location.

The cotton survey results shown in Tables 1 and 2 were not meant to define the entire U.S. crop, but to investigate how current ginning practices influence cotton staple and color parameters. The USDA, AMS publishes U.S. cotton quality data each year for the entire U.S. crop. In 2005, approximately 33% of the U.S. crop met the Cotlook A index of staple 35, 31 color, and leaf grade 3, while approximately 75% met the U.S. basis of staple 34, 41 color, and leaf grade 4 (USDA-AMS, 2005). In 2006, approximately 33% again met the Cotlook A index, while approximately 79% met the U.S. basis (USDA-AMS, 2006). In the same reports, AMS gave the average staple length for 2005 and 2006 U.S. cotton crops as 34.8 and 35.2 respectively. While AMS does not report an average color grade for the U.S. crop, Tables 1 and 2 give some indication how lint cleaning affects these two cotton quality parameters. While color and trash vary from year to year, it would appear that average U.S. cotton staple lengths do reasonably well in meeting both the U.S. and international demand as indicated by the respective basis for trade. Similarly, average U.S. staple lengths reported by AMS for 2007, 2008, and 2009, are 35.3, 35.7, and 35.5 respectively.

Table 2. Average Color Grade

Measurement	*Before Lint Cleaning*	*One Stage Lint Cleaning*	*Two Stages Lint Cleaning*
31 or better, %	49.0	71.4	
41 or better, %	88.1	93.5	
31 or better, %	50.0		75.3
41 or better, %	84.0		98.9

Uniformity Index is not specified in any marketing basis, but is determined by HVI and is specified in cotton sales contracts. Table 3 shows the cotton quality survey results for uniformity across the cotton belt and how lint cleaning almost always significantly decreased uniformity. The uniformity levels shown in Table 3 were not greatly different across the belt and were not greatly reduced due to lint cleaning, but in all cases either trended lower or were significantly lower due to the action of one or two saw-type lint cleaners. Short fiber content affects the uniformity index and also is not currently measured by HVI or part of current cotton trading, Table 4 shows Advanced Fiber Information System (AFIS) short fiber percentages and how those percentages trended higher or significantly increased due to lint cleaning, while uniformity trended lower with increased lint cleaning. Table 4 also shows there was a great deal of variability in short fiber content across the cotton belt immediately after the gin stand and after one or two lint cleaners. These differences in short fiber were probably due in part to varietal differences such as fiber strength and micronaire levels.

Table 3. Average Uniformity Index

Region	*Before Lint Cleaning*	*One Stage Lint Cleaning*	*Two Stages Lint Cleaning*
Southeastern[z]	82.0 a	81.0 b	
Mid-South[z]	82.1 a	81.5 b	
Southwest[z]	80.5 a	80.0 b	
Southwest[z]	81.7 a		80.8 b
Far West[z]	81.8	81.2	
Far West[z]	83.1 a		82.2 b

[z]Means in a row followed by different letters are significantly different at the 5% level (Whitelock et al., 2010)

Table 4. Average Percentage AFIS Short Fiber by Weight

Region	*Before Lint Cleaning*	*One Stage Lint Cleaning*	*Two Stages Lint Cleaning*
Southeastern[z]	9.9 b	11.2 a	
Mid-South[z]	8.8 b	9.1 a	
Southwest[z]	12.3	13.2	
Southwest[z]	11.7 b		12.4 a
Far West[z]	10.4 b	11.2 a	
Far West[z]	7.9 b		8.5 a

[z] Means in a row followed by different letters are significantly different at the 5% level (Whitelock et al., 2010)

It is common knowledge that there is a strong relationship between short fibers and neps (Textile Topics, 2004). Table 5 shows nep counts before and after lint cleaning and across regions as determined by (Whitelock et al., 2010). As would be expected there were significant differences in average nep counts before and after lint cleaning. Whitelock et al. (2010) did not analyze nep levels across regions or correlate nep levels with short fiber content but there were almost twice as many neps on average in the Southwest cottons before lint cleaning as there were in the Southeastern cottons. After one lint cleaner these large differences in nep levels still persisted. Also, the lower average nep contents in Table 5 seem to be associated with the lower short fiber contents before and after lint cleaning in Table 4. Acceptable nep count levels in raw cotton are not part of current world cotton marketing but generally nep levels of 150 neps per gram or lower are considered good by foreign textile mills. The Southeastern and Mid-South cotton samples before and after lint cleaning in Table 5 were the only ones that come close to the 150 neps per gram level.

Table 5. Average AFIS Nep Count, g^{-1}

Region	*Before Lint Cleaning*	*One Stage Lint Cleaning*	*Two Stages Lint Cleaning*
Southeastern[z]	176 b	212 a	
Mid-South[z]	172 b	192 a	
Southwest[z]	329 b	417 a	
Southwest[z]	342 b		474 a
Far West[z]	243 b	280 a	
Far West[z]	276 b		350 a

[z] Means in a row followed by different letters are significantly different at the 5% level (Whitelock et al., 2010)

Tables 6, 7, and 8 show data taken from a replicated test using a uniform module of DP455 BG/RR that was grown in the Mesilla Valley of New Mexico and ginned at the USDA-ARS, Southwestern Cotton Ginning Research Laboratory, Mesilla Park, NM (Hughs and Armijo, 2007). The roller ginning was conducted on a Continental Phoenix Roto-bar at conventional (not high speed) ginning rates. All of the roller ginned treatments were processed through two mill-type lint cleaners followed by super-jets before ginned fiber samples were taken for analysis. The saw ginned treatments were done on a cut down 41 Continental Double Eagle operated at 75% motor load. Saw ginned fiber samples were then taken for analysis after zero (no lint cleaning), one, two, or three saw-type lint cleaners. Table 6 shows the effects of the different ginning treatments on fiber length as determined by HVI classing. As expected, the roller ginned fiber was longer and average fiber length decreased as the severity of the ginning treatment increased. According to Speed et al. (2006) DP 455 BG/RR should have an average staple length of 36.2 which Table 6 shows that it does through two saw-type lint cleaners. However, roller ginning this particular cotton resulted in an average fiber length that is two to three staple lengths longer. This cotton would be expected to normally meet the Cotlook A fiber index of staple 35, but roller ginning would result in a more premium fiber.

Table 6. HVI Staple Length Range

Measurement	*Roller Gin*	*Saw Gin* 0 LC*	*Saw Gin 1 LC*	*Saw Gin 2 LC*	*Saw Gin 3 LC*
Staple length, 32nds	38 – 39	36 – 37	36 – 37	36	35
Upper Half Mean Length, in.	1.195 – 1.21	1.135 – 1.168	1.123 – 1.153	1.123 – 1.138	1.085 – 1.098

* 0 LC: no lint cleaning, 1 LC: after one lint cleaner, 2 LC: after two lint cleaners, 3 LC: after three lint cleaners

Table 7 shows the color grade for the respective ginning treatments. As expected color grade tended to improve with saw ginning and continued to improve with more cleaning even for initially clean white cottons, while roller ginning resulted in slightly lower color grades for comparable cottons. This tendency seen in Table 7 is attributed to a rougher cotton sample surface with less fiber blending from roller ginning and mill-type lint cleaners than is obtained from saw ginning and saw-type lint cleaners.

Table 7. Average HVI Color Grade Range

Roller Gin	*Saw Gin* 0 LC*	*Saw Gin 1 LC*	*Saw Gin 2 LC*	*Saw Gin 3 LC*
21-1 to 31-1	31-1 to 31-2	21-2	21-1 to 21-2	21-1

* 0 LC: no lint cleaning, 1 LC: after one lint cleaner, 2 LC: after two lint cleaners, 3 LC: after three lint cleaners

Table 8 shows other fiber quality measurements related to length and processing. Roller ginned and mill-type lint cleaner cleaned cotton samples had a definite quality advantage over saw ginned and saw lint cleaned samples. The roller ginned DP 455 average nep level approached the 150 nep per gram level that would be highly desirable on the world market.

Table 8. Selected Average Fiber Properties

Fiber Property	*Roller Gin*	*Saw Gin* 0 LC*	*Saw Gin 1 LC*	*Saw Gin 2 LC*	*Saw Gin 3 LC*
HVI Uniformity Index, %	84.0	82.0	81.2	80.9	79.4
AFIS Short Fiber, %	8.94	11.96	13.76	15.28	16.44
AFIS Nep Count, #/g	180	263	288	395	538

* 0 LC: no lint cleaning, 1 LC: after one lint cleaner, 2 LC: after two lint cleaners, 3 LC: after three lint cleaners

Table 9 is from a study reported by Byler and Delhom (2010) conducted at the USDA-ARS, Cotton Ginning Research Unit, Stoneville, MS. The Stoneville Lab researchers installed a high-speed Lummus roller gin and are conducting a series of comparative ginning tests against saw ginning of selected Mid-South cottons. The staple length in 32nds and the color grade were interpolated from Byler and Delhom's (2010) report and added to Table 9 for reference. Byler and Delhom (2010) stated that the average differences in upper half mean length, uniformity, and short fiber were significant between the roller- and saw-ginning treatments. These differences were not large but would probably result in a price advantage for the roller ginned fiber. All of the roller ginned cultivars would have met the Cotlook A index length of staple 35, but not the 31 color. Byler and Delhom (2010) did not break down the cultivars by saw ginning treatment, but on average they met the Cotlook A index staple length and not the 31 color. Table 9 gives some indication that there may be an economic advantage to roller ginning selected varieties grown in the Mid-South, but further research remains to be done to establish what those advantages might be. Color grade of Mid-South cottons may be a continuing issue with roller ginning because of relatively higher moister levels in the Mid-South causing more fiber color degradation than in the relatively drier parts of the cotton belt where cottons are normally roller ginned.

Table 9. Average HVI Measurements After Lint Cleaning

			High-Speed Roller Gin by Cultivar			
	Saw Gin	High-Speed Roller Gin	Deltapine 164	FiberMax 960	Phytogen 485	Stoneville 4554
Staple Length, 32nds	36	38	38	38	38	36
Upper Half Mean, inch	1.14	1.17	1.18	1.19	1.18	1.13
Uniformity, %	80.9	82.2	81.2	82.4	83.6	81.6
Short Fiber, %	11.3	9.0	9.6	8.6	7.4	10.3
Color Grade	41-4	41-4	41-2	41-1	41-3	52-1

Tables 10, 11, and 12 are data taken from weekly reports that are issued by the USDA-AMS, Visalia Classing Office, Visalia, CA, on cottons grown and ginned in California during the 2010 production season and classed through January 7, 2011 (USDA-AMS, 2011). Although the Visalia Classing Office processes cotton samples from Arizona and New Mexico, the data in Tables 10, 11, and 12 reflect only California upland cottons that were saw- and roller-ginned. While these tables are not paired comparisons of identical cottons, the same upland varieties grown in California are both saw- and roller-ginned and many growers split their crops with some being saw-ginned and some roller-ginned. Table 10 shows the trend of roller-ginned uplands averaging about two staple lengths longer than saw-ginned uplands. This is consistent with the past several years of data showing that roller-ginned California uplands average about two staple lengths longer than saw-ginned.

Table 10. California Upland Staple Length Distribution Averages through January 7, 2011

Staple Length, 32nds	*Saw Ginned Upland, %*	*Roller Ginned Upland*
33	0.1	-
34	0.7	-
35	5.7	0.1
36	15.8	0.1
37	34.2	2.0
38	18.2	4.4
39	16.4	16.9
40	7.4	32.5
41	1.5	30.6
42	0.1	11.4
44	-	0.1
Average Staple Length	37.50	39.45

Table 11 shows the average color grades in California to date and illustrate that roller-ginned uplands tend towards somewhat lower color grades than do the same uplands that are saw-ginned and saw lint cleaned. Roller-ginned uplands from the 2010 crop had white color grades, particularly 21 and 31's, but there was a tendency as shown in Table 11, to have more of the light spot (22, 32, 42, and 52) and 31and 41 color grades rather than the 21 and 11 color grades relative to comparable saw-ginned uplands. These color grade differences are likely a result of the surface texture of the cotton sample and a tendency to have slightly higher leaf content in roller-ginned samples compared to saw-ginned.

Table 11. California Upland Color Grade Distribution Averages through January 7, 2011

Grade	*Saw Ginned Upland, %*	*Roller Ginned Upland, %*
11	6.5	0.9
12	0.0	-
21	38.4	20.8
22	0.3	0.9
23	0.0	-
31	47.3	52.2
32	0.7	4.4
41	5.7	17.4
42	-	2.0
52	-	0.2

As would be expected, the season average uniformity index of roller-ginned uplands to date in California for 2010 was higher than for saw-ginned uplands by about 2% as shown in Table 12. This uniformity difference should result in a higher price premium for the roller-ginned upland cotton.

Table 12. California Upland Uniformity Index Distribution Averages through January 7, 2011

Uniformity Range	*Saw Ginned Upland, %*	*Roller Ginned Upland, %*
76.5 – 79.4	1.3	0.0
79.5 – 82.4	82.9	3.6
82.5 – 85.4	15.8	95.8
Over 85.4	-	0.5
Season Average	81.64	83.77

Table 13 shows some of the spinning test results from the cotton whose raw fiber quality was shown in Tables 6, 7, and 8. These data illustrate, that for paired upland samples, there was less mill waste from the roller-ginned upland cotton processed through two mill-type/Superjet cleaners than there was for the saw-ginned upland cleaned by one saw-type lint cleaner. Also, the improved length and nep properties of the roller ginned cotton resulted in more even yarn. While it is difficult to determine what sort of premiums that roller-ginned California uplands are getting over saw-ginned uplands, anecdotally the authors have heard anywhere from 4 to 15 cents per pound premium, Table 13 shows that there are real textile quality improvements resulting from uplands being roller-ginned.

Table 13. Average Ring Spinning Data from Laboratory Test at Mesilla Park, NM

Spinning Property	*Roller Gin*	*Saw Gin* 0 LC*	*Saw Gin 1 LC*	*Saw Gin 2 LC*	*Saw Gin 3 LC*
Opening &Cleaning Waste, %	1.2	4.1	2.3	1.2	1.2
USTER Thick Places, #/1000yds	1482	1571	1752	1857	2271
USTER Thin Places, #/1000yds	280	401	506	595	931

* 0 LC: no lint cleaning, 1 LC: after one lint cleaner, 2 LC: after two lint cleaners, 3 LC: after three lint cleaners

Summary

All cotton is sold at a price depending on its fiber quality. The 2010 USDA-FSA cotton loan schedule of premiums and discounts (USDA-FSA, 2010) for American upland cotton set a base rate for American upland at a strict low middling (SLM) color grade 41, leaf grade 4, and staple 34. American cotton sold for domestic use would be traded on this basis and subject to market conditions, cottons of higher grade and staple would demand price premiums and those of lower grade and staple would be subject to price discounts. The international basis for cotton trading as indicated by the Cotlook A Index (Cotton Outlook, 2010) is a middling color grade 31, leaf grade 3, and staple 35.

American cotton that graded at our domestic basis would not be subject to price discount for U.S. textile mills but would be subject to some level of price discount internationally. The goal of every cotton producer is to market cotton that would garner a premium in the market place and not cotton that would be subject to a discount.

A review of recent information on U.S. cotton ginning practices and related ginned fiber quality information shows that there is a range of cotton qualities available across the U.S. cotton belt. It has long been known that the quality of baled raw fiber is affected by the type of gin stand used to separate the fiber and seed as well as the type and number of lint cleaners that are used to clean the ginned fiber. Recent data has shown that some U.S. cotton does not meet even the U.S. basis for staple length right after the saw gin stand and could be expected to be further reduced in length after saw-type lint cleaning. These cottons would probably be subject to discounts regardless of the markets they were sold in. Other U.S. cotton easily meet and exceed both the U.S. and Cotlook A Index bases for length after saw ginning and two saw-type lint cleaners and would be expected to garner a premium on the open market based on length.

Color grade of ginned fiber is also affected by ginning, but responds generally in the reverse of staple length. Fiber color grade, as determined by the HVI, tends to be the lowest right after the saw gin stand and improves with the amount of lint cleaning. Fiber color that would be subject to discount right after the gin stand may meet or exceed either basis after one or two saw-type lint cleaners. Other fiber properties such as uniformity, short fiber, or nep count tend to be adversely affected by additional processing after ginning as would be expected from past experience.

Recent experience with high speed roller-ginning of upland cottons, both in the laboratory and commercially, has shown that this relatively new ginning practice offers the ability to improve the marketability of U.S. upland cottons based on both the U.S. and Cotlook A Index bases. Long term roller ginning research and current commercial high-speed roller ginning experience on western upland cottons shows a marked advantage for roller ginning over saw ginning in all upland fiber properties except for possibly color and trash level. The disadvantage in color and trash levels for roller ginning is not large and reportedly has been more than offset by premiums paid for the improved length related properties. Recent research documenting the comparisons in quality of roller- and saw-ginned Mid-South cottons has shown some of the same fiber quality responses that have been shown for western cottons.

The implication of the range of ginning technology that is available to the U.S. cotton producer is that the U.S. is certainly competitive in all cotton markets and can even increase its ability to compete with knowledgeable selection of cotton varieties and ginning practices. It does mean that producers are going to have to be continually aware of both the quality of the cotton varieties they are producing and how those varieties are being processed at the cotton gin. Some currently grown U.S. varieties that do not meet the international length standard with saw ginning would often meet it if roller ginned, but roller ginning is now only available in the western part of the cotton belt.

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