

**GINNING AND FIBER CHARACTERISTICS
OF COTTON VARIETIES PLANTED IN
ULTRA NARROW ROW AND
CONVENTIONAL PATTERNS**

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Abstract

This research, the first year of a 3-year study, determined the ginning and fiber response of 11 varieties of cotton grown with the best available conventional and ultra narrow row (UNR) production practices. After harvesting, the cotton was ginned with the standard gin sequences recommended for spindle-and stripper-harvested cotton. For the analysis across production methods, the total foreign matter ranged from 10.3% for Fibermax 963 to 16.9% for Stoneville 373. With the exception of Stoneville 474, Suregrow 501, and Fibermax 819, HVI color grade indexes were about 94 (Strict Low Middling). Leaf grade ranged from a low of 2.3 for Deltapine 50 and Deltapine 5415 to a high of 4.1 for Stoneville 474. Neps per gram, short fiber content by weight and by number, and immature fiber content averaged 252.5, 7.4%, 19.9%, and 5.2%, respectively. Neps per gram ranged from 197 for DP 5111 to 333 for DP 50. Short fiber content (weight) ranged from 5.8% for Fibermax 819 to 9.7% for DP 50. Immature fiber content ranged from 3.9 for DP 5111 to 6.0 for SG 125. For conventional cotton, turnout averaged 35.2% and ranged from 32.5% for Deltapine 50 to 36.8% for Stoneville 373. For the stripper harvested cotton, foreign matter ranged from 16.1% for Stoneville 474 to 28.5% for Stoneville 373. Lint turnout averaged 30.5% and ranged from 28.7% for Deltapine 50 to 32.0% for Mycogen 556. All stripper-harvested samples were reduced for barkiness except Deltapine 5415, Suregrow 501, Stoneville 373, and Stoneville 474. Fibermax 819, DP 5111, and Suregrow 501 have the more desirable AFIS-quality related characteristics for both stripper and conventional harvest methods.

Introduction

Considerable interest in UNR cotton has stimulated numerous studies and reports illustrating the many advantages and disadvantages of UNR and conventional production systems. Anthony et al., (1999), evaluated the fiber quality characteristics of cotton produced in 10 locations using conventional and UNR production systems. They reported that similar market grades could be achieved from the more trashy UNR cotton by using additional cleaners at the gin.

However, some degradation in fiber quality from a mill perspective occurred. No effort was made to determine the impact of different varieties.

The purpose of this study was to determine the ginning response and fiber properties of different varieties of cotton grown with conventional and UNR production methods, and to determine varieties suited for UNR production. Ginning results of the first year of a 3-year study are presented.

Methodology

Eleven varieties of cotton were planted in one field at Stoneville, MS, in six replications with paired comparisons between conventional and UNR production methods. The best available management technology was used for both production practices. The six replications ensured that differences between soil types were accounted for during the study. The six reps were combined into two reps for ginning in order to get good lint turnout data and to provide an adequate sample for further analysis at the Cotton Quality Research Station, Clemson, SC. The 11 varieties were paired for UNR and conventional cottons. The 11 varieties were: Deltapine 2379, Deltapine 50, Deltapine 5111, Deltapine 5415, Fibermax 819, Fibermax 963, Mycogen 556, Suregrow 125, Suregrow 501, Stoneville 373, and Stoneville 474.

Field experiments were conducted on the Southern Weed Science Research Unit farm at Stoneville, MS. Fields were chiseled, disked and allowed to settle three months before planting. Varieties were planted in 40 and 7.5 inch rows as main plots with John Deere 7300 MaxEmerge II and 1730 planters. There were four replications and plots were 14' x 80'. Ultra narrow rows were achieved by making two passes with the 1730 planter. Stand counts were approximately 41,000 plants/acre for the wide-row cotton and 168,000 for the ultra narrow-row. The wide row cotton was harvested with a John Deere 699 spindle picker and the ultra narrow row with a John Deere 7455 stripper equipped with an S & H (Lubbock, TX) finger header. Both the wide row and ultra narrow row were treated similarly throughout the season with regard to insecticides. Multiple Pix applications were made totalling 24 oz. /acre. The harvest aids, tribufos and ethephon, were used to achieve defoliation and boll opening. The desiccant paraquat was used to kill the top of the stalk. Entire plots were harvested. Complete agronomic details will be reported later and will include all three years of the study.

The cotton was ginned in the microgin at the U.S. Cotton Ginning Laboratory using a standard sequence of gin machinery for the conventional cotton which included dryer, cylinder cleaner, stick machine, trashmaster, extractor-feeder/gin stand, and one stage of saw-type lint cleaning. For the stripper harvested, UNR cotton, an additional stick

machine was used after the trashmaster and a second stage of saw-type lint cleaning was used. A materials balance was conducted during the ginning phase of the process so that the true lint turnout could be determined. The samples were ginned in a completely random pattern. Foreign matter and moisture determinations were made at the Cotton Testing Lab at Stoneville, marketing classification was done by USDA at Dumas, AR, and Advanced Fiber Information System (AFIS) data was done by Cotton Incorporated.

Results and Discussion

Combined Results

Analyses of variance are presented in Table 1. The following variables were significant for harvest method: wagon fractionation (total and components of hulls, sticks and stems, motes, small leaf, which are not shown), feeder fractionation (total and components of motes, small leaf, pin trash, and sticks and stems, which are not shown), HVI classification (length, micronaire, strength, bark, reflectance, plusb, length, uniformity, color grade index), manual color grade index, length, and turnout. Note that color grade index is a statistical transformation of the non linear color grade to a linear index with color 31=100, color 41=94, color 51=85, etc. (Anthony, 1974) The following variables were significant for variety: wagon fractionation (sticks and stems, motes, small leaf, pin trash, but not their total) feeder fractionation (sticks and stem, motes, small leaf, but not their total), HVI classification (length, leaf, strength, reflectance, plusb, percent area, uniformity, color grade index), manual color grade index, manual leaf, and turnout. The interaction between treatment and variety was significant for the following variables: wagon fractionation (sticks and stems, motes, small leaf and pintrash), and HVI reflectance and HVI color index.

Means for the dependent variables for varieties and harvest methods are given in Table 2. The total foreign matter in the initial samples as denoted by wagon fractionation total indicates that foreign matter ranged from 10.34% for Fibermax 963 to 16.87% for Stoneville 373. Differences in wagon fractionation were likely due to the fact that the UNR cotton was harvested with a stripper that removes large quantities of plant parts along with the fiber as the "fingers" engage the plant and more from bottom to top. The spindles of the picker-type harvester used to harvest the conventional cotton rotate at high speeds in a horizontal plane and tend to grasp fiber, not plant parts. Based on its operating techniques, the amount of plant parts removed by the stripper should be a function of size of the cotton plant as well as level of defoliation. This fact is normalized (camouflaged) somewhat by the cleaner on the harvester because cleaning efficiency is directly related to trash level. Comparisons across both harvest methods suggest gross differences between varieties. With the exception of Stoneville 474,

Suregrow 501, and Fibermax 819, HVI color grade indexes were about 94 (Strict Low Middling). Similar values were reported for manual color grade index. Leaf grade ranged from a low of 2.3 for Deltapine 50 and Deltapine 5415 to a high of 4.1 for Stoneville 474 (not different from DP 5111, Fibermax 819). Leaf grades ranged from being much too clean to being the best leaf grade for the varieties for market purposes. HVI trash percent area, ranged from 0.13 for Deltapine 5415 to 0.38 for Stoneville 474 and Deltapine 5111. All varieties except Deltapine 5415, Suregrow 501, Stoneville 373, and Stoneville 474 had classing office calls for barkiness.

Based on the AFIS, neps per gram, short fiber content by weight and by number, and immature fiber content were all significant at the 1% level of probability for harvest method and variety; they averaged 252.5, 7.4%, 19.9%, and 5.2%, respectively. The means by harvest method were as follows:

Variable	Harvest method	
	Stripper	Conventional
Neps per gram	311	194
Short fiber content by weight, %	7.8	7.0
Immature fiber content, %	5.5	4.8

Neps per gram ranged from 197 for DP 5111 to 333 for DP 50. Short fiber content (weight) ranged from 5.8% for Fibermax 819 to 9.69% for DP 50. Immature fiber content ranged from 3.9 for DP 5111 to 6.0 for SG 125.

Conventional Harvest

Analyses of variance for the conventional method are presented in Table 3 with most variables being significant. Turnout averaged 35.2% and ranged from 32.5% for Deltapine 50 to 36.8% for Stoneville 373 (Table 4). With the exception of Stoneville 474 at 4.2, leaf grades were generally less than 4. Manual color grade index averaged 92.2 but ranged from 88.0 for Suregrow 501 to 94.0 for Deltapine 50, Deltapine 2379, Suregrow 125, and Stoneville 373. No samples were classed as barky.

The AFIS data for conventional harvest was significant for neps per gram, short fiber content (weight and number) and immature fiber; means were 194.3, 7.0%, 19.1% and 4.8%, respectively. Neps per gram ranged from 167.3 for SG 501 to 254.0 for DP 50. Immature fiber ranged from 4.2% for Fibermax 819 to 5.8% for SG 125.

For the conventional cotton, the following varieties had the lowest values for neps and short fiber content:

Variety	Neps/gram	Short fiber content by weight, %
DP 5111	149	5.8
DP 2379	177	6.3
Fibermax 819	175	5.9
SG 501	167	6.1

Acknowledgement

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References

Anthony, W.S., W.D. Mayfield, and T.D. Valco. 1999. Results of 1998 ginning studies of ultra narrow cotton. Proceedings Beltwide Cotton Conferences. 1484-1488.

Anthony, W.S. 1974. Development and evaluation of a small scale cotton ginning system. U.S. Department of Agriculture, ARS-S-36, 9 pp.

Stripper Harvested

Analyses of variance for the stripper harvested cotton is given in Table 5 with staple length, strength, Rd, plusb, length, uniformity, all being significant at the 5% or lower level of probability. Lint turnout averaged 30.5% and ranged from 28.7% for Deltapine 50 to 32.0% for Mycogen 556 (Table 6). Foreign matter (wagon fractionation total) averaged 19.6% and was reduced to 5.2% by the precleaning equipment. The lint cleaning equipment reduced the visible waste to 1.2% based on the Shirley Analyzer, which ranged from 1.1 to 1.5. Wagon fractionation ranged from 16.1% for Stoneville 474 and Fibermax 963 to 28.5% for Stoneville 373. Total foreign matter at the extractor-feeder apron ranged from 4.4% for Suregrow 501 to 6% for Fibermax 819. Classers leaf grade ranged from 2.3 for Deltapine 5415 to 4.0 for Stoneville 474. The HVI trash, percent area, ranged from 0.12 for Deltapine 5415 to 0.40 for Deltapine 5111 and Fibermax 819. All stripper-harvested samples were classed as "barky" except Deltapine 5415, Suregrow 501, Stoneville 373, and Stoneville 474. In summary, although there was a great deal of variability (16 to 29%) in the initial foreign matter harvested with the cotton, the final leaf grade was satisfactory; however, several varieties were classed as "barky" as noted above.

The AFIS data, except IFC, for stripper-harvested cotton was significant for all varieties. Means for neps per gram and short fiber content by weight were 311 and 7.8%, respectively. Neps ranged from 245 for DP 5111 to 412 for DP 50; short fiber content by weight ranged from 5.8 for Fibermax 819 to 10.4 for DP 50.

For the stripper-harvested cottons, the following varieties had the lowest values for neps and short fiber content by weight:

Variety	Neps/gram	Short fiber content by weight, %
Fibermax 819	287	5.8
Suregrow 501	256	6.1
DP 5111	245	7.1
STV 474	300	7.3
Suregrow 125	304	7.5

Conclusion

Additional cleaning machinery can be used on the stripper harvester and at the gin to achieve the same leaf grades for stripper-harvested cotton as for spindle-harvested cotton. Discounts for bark, however, will still exist. This additional cleaning will create more neps and short fibers, and thus lower mill quality. Some varieties respond more favorably than others. Fiber quality characteristics differ after ginning for varieties harvested with spindle pickers and strippers, and Fibermax 819, DP 5111, and Suregrow 501 have the more desirable short fiber content and nep characteristics for both UNR and conventional production methods.

Table 1. Analyses of variance (mean square) for comparison of UNR and conventional cottons.

Source	Manual Class			High Volume Instrument		
	DF	Leaf	Bark	Mike	Strength	RD
TREATMENT ¹	1	0.20	60.67**	0.52**	4.67**	188.20**
VARIETY	10	1.49**	5.38	0.13**	7.07**	9.36**
TREATMENT*						
VARIETY	10	0.10	13.98	0.03	0.39	1.29**
ERROR	22	0.18	8.45	0.03	0.21	0.36
MEAN		3.10	1.83	4.64	29.88	74.36
R-SQUARE		0.80	0.58	0.79	0.94	0.97
CV		13.67	159.19	3.45	1.54	0.80
ROOT MSE		0.42	2.91	0.16	0.46	0.60

Table 1. Analyses of variance (mean square) for comparison of UNR and conventional cottons - continued.

Source	High Volume Instrument					
	Plus b	Trash, percent area	Length	Uniform	Color grade index	
					Manual	HVI
TREATMENT ¹	0.35**	0.0009	0.003**	5.11**	236.45**	225.7**
VARIETY	1.40*	0.024**	0.003**	1.28**	10.79*	15.38**
TREATMENT*						
VARIETY	0.03	0.002	0.0002	0.24	7.58	10.04**
ERROR	0.03	0.004	0.0003	0.13	3.54	3.29
MEAN	7.92	0.27	1.11	81.87	94.50	94.10
R-SQUARE	0.96	0.75	0.87	0.88	0.84	0.87
CV	2.10	23.57	1.45	0.44	1.99	1.93
ROOT MSE	0.17	0.01	0.02	0.36	1.88	1.81

Table 1. Mean squares from the Analyses of Variance for comparison of UNR and conventional cottons - continued.

Source	Turnout [†]	Moisture, %		Fractionation, %		Shirley Analyzer	
		Wagon	Lint	Wagon	Feeder	Visible	Total
TREATMENT ¹	242.23**	0.002	0.04	2242.17**	56.78**	0.08	0.00
VARIETY	4.76**	0.37**	0.06	13.48	0.59	0.24	0.19**
TREATMENT*							
VARIETY	0.99	0.06	0.05	11.86	0.19	0.02	0.01
ERROR	0.99	0.12	0.35	6.07	0.28	0.13	0.04
MEAN	32.83	7.69	4.79	12.49	4.03	1.86	1.21
R-SQUARE	0.93	0.62	0.13	0.95	0.91	0.47	0.71
CV	3.03	4.47	12.36	19.72	13.14	19.56	16.1
ROOT MSE	0.99	0.34	0.59	2.46	0.53	0.36	0.20

Table 1. Mean squares from the Analyses of Variance for comparison of UNR and conventional cottons - continued.

Source	Advanced Fiber Information			
	Neps per gram	Short fiber content by weight, %		Immature fiber
TREATMENT ¹	149217.09**		7.67**	5.92**
VARIETY	6187.40**		6.33**	1.55**
TREATMENT*				
VARIETY	903.09		0.44	0.17
ERROR	10482.00		0.36	0.27
MEAN	252.51		7.44	5.15
R-SQUARE	0.90		0.90	0.80
CV	13.16		8.07	10.03
ROOT MSE	33.23		0.60	0.52

¹Treatment = ultra narrow row stripper harvested cotton and conventional row spacing spindle harvested cotton.

Turnout = lint divided by seed cotton without regard to foreign matter.

*Indicates significance at the 5% probability level.

**Indicates significance at the 1% probability level.

Table 2. Means for dependent variables for varieties across harvest methods.

Variety	Color grade index				High Volume Instrument			Trash, percent area	Length, in.	Uniform
	Manual	HVI	Leaf	Mike	Strength, g/tex	RD	PLUSB			
DP 50	96.5a	96.00ab	2.33f	4.50cde	27.74g	76.25a	7.47fg	0.20cd	1.12cd	81.00e
DP 2379	95.00ab	95.00abc	3.42bcd	4.72abc	29.31de	75.00b	7.72de	0.34ab	1.08ef	82.25ab
DP 5111	93.75ab	93.25bcd	3.83ab	4.94a	30.12c	73.42d	7.91cd	0.38a	1.07f	82.00bcd
DP 5415	96.25a	96.25a	2.25f	4.69bcd	29.81cd	76.00a	7.58ef	0.13d	1.11cd	80.83e
Fibermax 819	92.50b	92.50cde	3.75abc	4.56cde	32.08a	74.33bc	7.29gh	0.36ab	1.15a	82.67a
Fibermax 963	96.58a	96.00ab	2.67ef	4.55cde	29.69cde	76.75a	7.21h	0.22cd	1.07f	81.83bcd
Mycogen 556	94.42ab	94.00abcd	3.00de	4.35e	31.81a	72.58e	9.30a	0.28bc	1.15a	81.67cd
Suregrow 125	95.00ab	95.00abc	2.75ef	4.63bcd	28.48f	74.17cd	8.27b	0.22cd	1.12bc	82.17abc
Suregrow 501	92.00b	90.00e	2.83def	4.80ab	31.06b	72.58e	8.00c	0.27bc	1.12cd	82.33ab
Stoneville 373	95.00ab	95.00abc	3.17cde	4.46de	29.09ef	74.42bc	8.10bc	0.23c	1.14ab	81.58d
Stoneville 474	92.50b	92.08de	4.08a	4.84ab	29.48de	72.42e	8.32b	0.35ab	1.10de	82.25ab

Table 2. Means for dependent variables for varieties across harvest methods - continued.

Variety	Moisture, %		Wagon fractionation, %	Turnout, %
	Wagon	Lint	Total	
DP 50	7.47bc	4.90	11.21b	30.62e
DP 2379	7.60bc	4.77	11.68b	31.59de
DP 5111	7.73bc	4.88	12.06b	31.80cde
DP 5415	7.34c	4.80	11.52b	33.21abc
Fibermax 819	7.38c	5.00	13.21ab	33.17abc
Fibermax 963	7.68bc	4.70	10.34b	33.02abcd
Mycogen 556	7.57bc	4.92	13.77ab	34.14a
Suregrow 125	7.61bc	4.60	12.05b	33.28abc
Suregrow 501	7.97ab	4.83	13.78ab	32.58bcd
Stoneville 373	8.41a	4.70	16.87a	33.67ab
Stoneville 474	7.87abc	4.70	10.93b	34.04ab

Table 2. Means for dependent variables for varieties and harvest methods - continued.

Variety	Feeder fractionation, % Total	Shirley Analyzer, %		Advanced Fiber Information System		
		Visible	Total	Neps	SFCW	IFC
DP 50	3.85abc	1.62a	0.98d	333a	9.7a	5.4abcd
DP 2379	4.01abc	2.20a	1.48ab	256cd	7.2bcd	5.6abc
DP 5111	3.79abc	2.14a	1.37abc	197e	6.4def	3.9f
DP 5415	4.39abc	1.71a	1.06d	308ab	9.6a	4.6ef
Fibermax 819	4.74a	2.06a	1.53a	231cde	5.8f	4.8de
Fibermax 963	3.53abc	1.62a	1.04d	264bc	7.6bc	5.8ab
Mycogen 556	3.77abc	2.05a	1.21bcd	253cd	8.0b	5.2bcde
Suregrow 125	4.0abc	1.59a	1.05d	246cd	7.2bcd	6.0a
Suregrow 501	3.64bc	1.75a	1.08cd	212de	6.1ef	5.0cde
Stoneville 373	4.05abc	1.65a	1.03d	230cde	7.5bc	5.6abc
Stoneville 474	4.55ab	2.09a	1.52a	248cd	6.8cde	4.7de

Table 3. Analysis of variance for conventional harvest.

Variable	Mean squares		Mean	R-square	Coefficient of variability	Root mean square error
	Variety	Error				
Leaf	0.86*	0.16	3.03	0.83	13.27	0.40
Mike	0.88**	0.01	4.75	0.85	2.50	0.12
Strength	2.88**	0.20	30.20	0.93	1.47	0.44
RD	6.82**	0.39	72.29	0.94	0.86	0.62
PLUSB	0.66**	0.01	8.01	0.98	1.39	0.11
Percent, trash area	0.01*	0.002	0.26	0.83	16.74	0.044
Length	0.001*	0.0003	1.12	0.80	1.63	0.02
Uniform	0.43*	0.14	82.21	0.74	0.46	0.38
Color grade index	8.04	4.34	92.18	0.63	2.26	2.08
HVI color grade index	16.51**	2.58	91.83	0.85	1.75	1.61
Turnout	3.54**	0.08	35.18	0.98	0.79	0.28
Wagon fractionation total	1.13	0.46	5.36	0.69	12.73	0.68

Table 3. Analysis of variance for conventional harvest - continued.

Variable	Mean squares		Mean	R-square	Coefficient of Variability	Root mean square error
	Variety	Error				
Feeder fractionation total	0.18	0.13	2.89	0.57	12.33	0.36
Shirley Analyzer, total	0.12	0.11	1.90	0.48	17.69	0.34
Shirley Analyzer, visible	0.10*	0.03	1.21	0.76	14.37	0.17
Wagon moisture	0.23	0.18	7.68	0.54	5.54	0.43
Lint moisture	0.04	0.39	4.82	0.08	12.99	0.63
AFIS						
Neps per gram	1767.70**	265.07	194.27	0.86	8.38	16.28
Short fiber content, %, weight	2.54**	0.11	7.02	0.95	4.82	0.34
Short fiber content, %, number	12.41**	0.53	19.13	0.96	3.81	0.73
Immature fiber content, %	0.92*	0.22	4.78	0.78	9.89	0.47

*Indicates significance at the 5% probability level.

**Indicates significance at the 1% probability level.

Table 4. Means for dependent variables for conventional harvest.

Variety	Color grade index			High Volume Instrument				Percent, trash area
	Manual	HVI	Leaf	Mike	Strength	RD	PLUSB	
DP 50	94.00a	94.00a	2.17e	4.68cd	28.13d	74.67a	7.52d	0.18de
DP 2379	94.00a	94.00a	3.00bcde	5.05ab	30.00b	72.83bc	7.72de	0.32ab
DP 5111	92.50ab	92.50ab	3.83ab	5.07a	30.98a	70.67d	8.13c	0.35a
DP 5415	92.50ab	92.50ab	2.17e	4.78bc	29.82bc	73.67ab	7.58ef	0.15e
Fibermax 819	91.00ab	91.00ab	3.67abc	4.65cde	31.90a	72.33c	7.43de	0.32ab
Fibermax 963	93.17ab	94.00a	2.67de	4.68cd	29.98b	74.83a	7.25e	0.20cde
Mycogen 556	89.83ab	89.00b	3.17bcd	4.35e	31.75a	69.83d	9.28a	0.30abc
Suregrow 125	94.00a	94.00a	2.50de	4.72cd	28.92cd	73.00bc	8.37b	0.23bcde
Suregrow 501	88.00b	85.00c	2.83cde	4.83abc	31.45a	69.83d	8.05c	0.28abcd
Stoneville 373	94.00a	94.00a	3.17bcd	4.47de	29.37bc	73.17bc	8.13c	0.22bcde
Stoneville 474	91.00ab	90.17b	4.17a	4.90abc	29.95b	70.33d	8.43b	0.37a

Table 4. Means for dependent variables for conventional harvest – continued.

Variety	High Volume Instrument		Wagon fractionation, %			Turnout, %
	Length	Uniform	Wagon moisture, %		Total	
DP 50	1.13abc	81.50bc	7.31a		4.63c	32.52e
DP 2379	1.09bcd	82.25ab	7.70a		4.95abc	33.48d
DP 5111	1.08cd	82.50a	7.81a		5.60abc	33.84d
DP 5415	1.12abcd	81.33c	7.39a		4.75c	35.34c
Fibermax 819	1.15a	82.33ab	7.26a		6.74a	35.89bc
Fibermax 963	1.08d	82.00abc	7.53a		4.61c	35.42c
Mycogen 556	1.16a	82.17abc	7.75a		6.63ab	36.24b
Suregrow 125	1.13abc	82.50a	7.46a		4.83bc	35.34c
Suregrow 501	1.13ab	82.67a	8.02a		5.26abc	35.90bc
Stoneville 373	1.16a	82.00abc	8.38a		5.21abc	36.83a
Stoneville 474	1.12abcd	82.67a	7.94a		5.72abc	36.14b

Table 4. Means for dependent variables for conventional harvest - continued.

Variety	Feeder fractionation, % Total	Shirley Analyzer, %			Advanced Fiber Information System	
		Total	Visible	Neps	Short fiber content by weight, %	Immature fiber content, %
DP 50	2.76a	1.60a	0.88d	254a	9.0a	5.1ab
DP 2379	2.86a	2.27a	1.45abc	177cde	6.3de	4.8ab
DP 5111	2.71a	2.13a	1.30abcd	149e	5.8e	3.4c
DP 5415	3.08a	1.77a	1.03cd	234ab	8.8a	4.3bc
Fibermax 819	3.50a	1.99a	1.52ab	175cde	5.9e	4.3bc
Fibermax 963	2.54a	1.68a	1.05cd	194cd	7.3bc	5.4ab
Mycogen 556	2.90a	2.11a	1.26abcd	210bc	7.9b	5.1ab
Suregrow 125	2.70a	1.73a	1.09bcd	189cd	6.8cd	5.8a
Suregrow 501	2.91a	1.85a	1.15abcd	167de	6.1e	4.7ab
Stoneville 373	2.56a	1.63a	0.98d	192cd	7.1c	5.5a
Stoneville 474	3.32a	2.19a	1.56a	197bcd	6.3de	4.3bc

Table 5. Analysis of variance for stripper-harvested cottons.

Variable	Mean squares		Mean	R-square	Coefficient of variability	Root mean square error
	Variety	Error				
Leaf	0.73	0.20	3.17	0.77	14.02	0.44
Mike	0.07	0.04	4.53	0.63	4.26	0.19
Strength	45.93**	0.23	29.55	0.95	1.61	0.47
RD	38.26*	3.56	76.42	0.91	0.74	0.57
PLUSB	7.63**	0.04	7.83	0.94	2.64	0.21
Trash percent area	0.016	0.006	0.27	0.71	28.51	0.078
Length	0.002**	0.0002	1.10	0.91	1.25	0.01
Uniform	10.87*	0.12	81.53	0.89	0.42	0.34
Color grade index	103.27	2.73	96.82	0.77	1.71	1.65
HVI color grade index	8.91	4.00	96.36	0.67	2.08	2.00
Bark	16.50	33.00	3.00	0.53	122.22	3.67
Turnout	2.23	1.90	30.48	0.52	4.52	1.38
Wagon fractionation total	24.20	11.68	19.63	0.65	17.41	3.42
Feeder fractionation total	0.59	0.43	5.17	0.55	12.75	0.66
Shirley Analyzer Total	0.13	0.15	1.82	0.45	21.41	0.39
Shirley Analyzer Visible	0.10	0.05	1.22	0.66	17.70	0.22
Wagon Moisture	0.19*	0.05	7.70	0.76	3.04	0.23
Lint Moisture	0.08	0.31	4.76	0.18	11.69	0.56
AFIS						
Neps per gram	5322.53	1943.92	310.74	0.71	14.19	44.09
Short fiber content, %, weight	4.22**	0.61	7.85	0.86	9.91	0.78
Immature fiber content, %	0.81	0.31	5.52	0.70	10.08	0.56

*Indicates significance at the 5% probability level.

**Indicates significance at the 1% probability level.

Table 6. Means for dependent variables for stripper-harvested cotton.

Variety	Color grade index			High Volume Instrument				Trash, percent area
	Manual	HVI	Leaf	Mike	Strength	RD	PLUSB	
DP 50	99.00ab	98.00ab	2.50c	4.32a	27.35f	77.83ab	7.42ef	0.22ab
DP 2379	96.00abc	96.00ab	3.83ab	4.38a	28.62de	77.17bc	7.48ef	0.37a
DP 5111	95.00bc	94.00b	3.83ab	4.82a	29.23cd	76.17cd	7.68cde	0.40a
DP 5415	100.00a	100.00a	2.33c	4.60a	29.80bc	78.33ab	7.57def	0.12b
Fibermax 819	94.00c	94.00b	3.83ab	4.47a	32.27a	76.33cd	7.15f	0.40a
Fibermax 963	100.00a	98.00ab	2.67c	4.42a	29.40cd	78.67a	7.17f	0.23ab
Mycogen 556	99.00ab	99.00ab	2.83bc	4.30a	31.87a	75.33de	9.32a	0.25ab
Suregrow 125	96.00abc	96.00ab	3.00abc	4.55a	28.05ef	75.33de	8.17b	0.20ab
Suregrow 501	96.00abc	95.00ab	2.83bc	4.77a	30.67b	75.33de	7.95bcd	0.25ab
Stoneville 373	96.00abc	96.00ab	3.17abc	4.45a	28.82cde	75.67de	8.07bc	0.25ab
Stoneville 474	94.00c	94.00b	4.00a	4.78a	29.02cde	74.50e	8.20b	0.33a

Table 6. Means for dependent variables for stripper-harvested cotton – continued.

Variety	High Volume Instrument			Wagon		
	Length	Uniform	Bark	Moisture, %	Fractionation, %	Turnout, %
DP 50	1.11cd	80.50de	3.7a	7.63bc	17.79b	28.72a
DP 2379	1.06e	81.83bc	3.7a	7.51bc	18.42b	29.71a
DP 5111	1.07e	81.50bc	1.8a	7.65bc	18.52b	29.76a
DP 5415	1.10cd	80.33e	0.0a	7.30c	18.30b	31.07a
Fibermax 819	1.16a	83.00a	7.3a	7.49bc	19.68ab	30.45a
Fibermax 963	1.07e	81.67bc	7.3a	7.84bc	16.08b	30.63a
Mycogen 556	1.14ab	81.17cd	3.7a	7.39bc	20.91ab	32.04a
Suregrow 125	1.12bc	81.83bc	5.5a	7.76bc	19.28ab	31.23a
Suregrow 501	1.10cd	82.00b	0.0a	7.92ab	22.31ab	29.27a
Stoneville 373	1.13bc	81.17cd	0.0a	8.43a	28.54a	30.50a
Stoneville 474	1.08de	81.83bc	0.0a	7.80bc	16.13b	31.94a

Table 6. Means for dependent variables for stripper-harvested cotton - continued.

Variety	Feeder fractionation, % Total	Shirley Analyzer			Advanced Fiber Information System	
		Visible	Total	Neps	Short fiber content by weight, %	Immature fiber content
DP 50	4.95a	1.08a	1.62a	412a	10.4a	5.7ab
DP 2379	5.15a	1.51a	2.20a	335abc	8.1b	6.4a
DP 5111	4.88a	1.43a	2.14a	245c	7.1bcd	4.4b
DP 5415	5.69a	1.09a	1.71a	383ab	10.3a	5.0ab
Fibermax 819	5.98a	1.54a	2.06a	287bc	5.8d	5.4ab
Fibermax 963	4.52a	1.02a	1.62a	334abc	7.8bc	6.3a
Mycogen 556	4.64a	1.17a	2.05a	296bc	8.0b	6.2ab
Suregrow 125	5.34a	1.01a	1.59a	304abc	7.5bcd	6.3a
Suregrow 501	4.37a	1.01a	1.74a	256c	6.1cd	5.3ab
Stoneville 373	5.54a	1.08a	1.64a	268c	8.0b	5.7ab
Stoneville 474	5.78a	1.49a	2.09a	300abc	7.3bcd	5.2ab