Fiber Quality and Ginning Performance of Machine Picked and Stripped Cotton, Southeastern Area, 1964–66

Marketing Research Report No. 852

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SUMMARY AND CONCLUSIONS

A 3-year study was conducted at the Southeastern Cotton Ginning Research Laboratory, Clemson, S.C., to compare the ginning performance, fiber quality, and spinning performance of cotton harvested with a spindle picker and with a brush-type stripper and to evaluate cotton conditioning and cleaning treatments for ginning cotton harvested by the two methods. The study was made on Auburn 56 variety cotton in the 1964, 1965, and 1966 crop seasons, in cooperation with the Agricultural Research Service Pilot Spinning Laboratory, also at Clemson, S.C.

Based on Commodity Credit Corporation (CCC) loan prices at Greenville, S.C., for grades and staples obtained, the 1964 gross value of lint and seed per acre was about $43 less for the picker-harvested cotton than for stripper-harvested cotton at Clemson. Yields per acre were 1.76 bales with the picker and 2.13 bales with the stripper. A large part of this yield difference resulted from differences in harvesting efficiency. In 1965 the difference was $23 per acre in favor of the stripper at Clemson and $3 per acre in favor of the picker at Auburn. Yields were about 1.90 bales per acre with the picker and 2.25 bales with the stripper at Clemson. In 1966, with a rainy harvest season, the difference was about $27 per acre in favor of the picker at Auburn, based on a yield of about 1.5 bales per acre for each method of harvest.

Thus, averaging over the 3 years and between the two locations, the gross return with the stripper was $9 per acre greater than with the picker. However, this average is subject to a wide margin of error due to the variations in field conditions, yields, harvester efficiencies, and other uncontrolled factors over the 3 years and between the two locations. Also, the average gross return, to be meaningful, must be adjusted for differences in harvesting and ginning costs, which were not measured in this study. Harvesting costs would be lower for the stripper, but ginning costs would be higher. In this study, machine-picked cotton ginned about 24 percent faster than stripped cotton.

Another qualification of this result is that under today's market situation, the CCC loan is considerably below market prices received for most cotton. If the cotton is known to be stripped and actually is forced to sell at loan prices because of inferior processing performance, then that cotton would lose the small economic advantage indicated because of the large difference between market prices and loan values.

Stripping consistently tended to produce cotton that was slightly shorter, weaker, and finer than picked cotton. In every case, foreign matter was greater in the stripped cotton. Averaged over the 3 years and between the two locations, picked cotton had greater 2.5-percent span length, length uniformity, ⅛-inch-gage Pressley fiber strength, and micronaire reading and less foreign matter as measured by the Shirley Analyzer.

The processing results followed the pattern of fiber data—picked cotton processed significantly better than stripped cotton. Averaged over the 2 years and between the two locations, picked cotton had less total manufacturing waste, greater break factor and yarn appearance index, lower yarn irregularity coefficient of variation, and fewer ends down per 1,000 spindle hours.

Although results from ginning treatments were different over the 3 years, they can be summarized briefly. The treatments produced only a few substantial differences in results in any of the 3 years. In the 1964 Clemson test, placing the stick and green leaf machine last in the sequence of ginning equipment produced cotton of slightly

lower grade, valued at 43 points per pound less than cotton from the other treatments. No differences were apparent whether the stick and green leaf machine was placed before or after the first cleaner. At both Clemson and Auburn in 1965, placing the stick and green leaf machine before the first cleaner produced cotton with the lowest foreign matter content and with a slightly higher grade than other treatments, but with a somewhat lower spinning performance. This result on foreign matter content and grade was the same at Auburn in 1966.

Responses to cleaning treatments by the stripped and the picked cotton were similar.

In conclusion, the results indicate quite clearly that the performance of stripped cotton is lower than that of picked cotton when both are handled in the conventional manner. The lower performance of stripped cotton indicates that stripping would not be advantageous to producers in the long run or to manufacturers until improvements in handling stripped cotton can be made, despite the small advantage to the producer indicated by gross returns per acre. The chance of a gain for the producer in the short run is small in comparison with the indicated differences in the use value of picked and stripped cottons.

BACKGROUND AND OBJECTIVES

The cost of producing cotton in the Southeast could be reduced by the use of once-over stripper harvesting and other low-cost harvesting methods, but the widespread introduction of strippers would impose new problems to the ginners. Stripper-type cotton varieties are not now available and the gins are not generally equipped to handle stripped cotton. Also, we would be faced with the question of what effects the introduction of stripping would have on the quality of the lint and the processing of the fiber. Then, too, the relatively high rainfall in the Southeast may result in microbial damage to the lint and insect damage to the boll far greater than that found in areas where stripping is now successful.

The stripper that seems to have potential is a two-row machine with rolls having alternating rows of brushes and rubber flaps. It is also called a brush harvester. Field demonstrations have indicated that this machine can harvest cotton for approximately $5 per acre in fields yielding one bale per acre. Some cotton was stripped in the Southeast on a small scale in the 1962 and 1963 crop seasons. In 1963 a limited analysis of this cotton was made by the Southeastern Cotton Ginning Research Laboratory, and field observations were made of harvesting and ginning operations.

The actual number of strippers operating in the Southeast at any one time during the past few years is not known. In most cases they operated on a trial basis, and their actual use depended on weather conditions, plant and field conditions, and availability of cooperating ginners. However, the Cooperative Extension Service and other groups indicated that perhaps as many as 50 strippers operated in some years.

Stripping was experimentally investigated at the Sandhill Experiment Station at Columbia, S.C., in the late 1940's and early 1950's and was found to be impractical for that area. At the time these early tests were conducted, the primary problems associated with stripping were: (1) Lack of an acceptable variety; (2) inadequate weed control; and (3) lack of dependable defoliation methods.[1] Weed control and defoliation methods have been improved during the past 15 years, and machines for stripping cotton have also been improved.

Based on this history of events, the Southeastern Cotton Ginning Research Laboratory conducted tests on cottons harvested by spindle pickers and by brush strippers from the Piedmont area of South Carolina in 1964 and 1965 and from the Coastal Plain area of Alabama in 1965 and 1966. This research was to determine the ginning requirements of stripped cotton, and tests were made on the type, amount, and sequence of ginning machinery needed to produce acceptable grades and staples for the farmer and acceptable fiber quality for the spinner. Comparisons between stripping and conventional picking were also a part of this research.

Some results of research directly relating to this study have recently been published by Corley and Kirk.[2]

Objectives of the present study were as follows:

(1) To compare the ginning performance, fiber qualities, and spinning performance of picked versus stripped cotton.

(2) To determine the effect of certain gin conditioning and cleaning treatments on cotton harvested by mechanical pickers and strippers.

(3) To determine relative bale values (based on classification and bale weights) and returns per acre (based on yields and bale values).

[1] NUTT, G. B., EVANS, J. S., and BALK, W. A. HARVESTING COTTON WITH SPINDLE PICKERS AND STRIPPERS. S.C. Expt. Sta. of Clemson Agr. Col. 62d Ann Rpt., pp. 13-16. 1950.

[2] CORLEY, T. E., and KIRK, I. W. PICKER VERSUS STRIPPER HARVESTING OF COTTON. Agr. Expt. Sta., Auburn Univ. Highlights of Agricultural Research 14(3): 9. 1967.

SOURCES OF COTTON

Auburn 56 variety cotton was used throughout the 3-year study. It is an open-boll variety, as are all others normally grown in the Southeast. However, it was selected because of its storm-resistant characteristics, which would make it more suitable for stripper harvesting than some of the other varieties.

In 1964 and 1965, 27 bales were harvested each year by the Clemson Station of the South Carolina Experiment Station for the test. The fields were on the Simpson Farm near Pendleton, S.C., in the Piedmont. Soil type was Cecil Sandy Loam, 2- to 6-percent slope. In 1965 and 1966, 27 bales were harvested each year by the Alabama Experiment Station. The fields were on the Agricultural Engineering Research Unit Farm near Auburn, Ala., in the Coastal Plain. Soil type was Norfolk and Ruston Sandy Loam.

PROCEDURE

Production and Harvesting

Clemson 1964 crop

Cottonseed were hill dropped in 40-inch rows for both methods of harvest. The hills were 9 inches apart, with approximately three plants per hill, giving a plant population of about 52,000 per acre. Trifluralin, a herbicide, was broadcast and incorporated with a disc harrow. Grass control was excellent.

Weather conditions encouraged vegetative development of the cotton plants. The average height of full-grown cotton was about 40 inches, but the height of plants in some of the more fertile contoured intervals was as much as 5 feet.

Seed cotton samples were sufficiently large to supply approximately 1,000 pounds of cleaned seed cotton. A total of 27 of these seed cotton lots were harvested, nine for each of the following: (1) First machine picking; (2) second machine picking; and (3) machine stripping. Approximately 25 to 30 acres were required for the overall study. The largest acreage required was for the second picking since it was necessary to cover more area in harvesting the 1,000-pound lots.

The harvesters used were a high-drum John Deere 22H picker with tapered spindles and a two-row Hesston V–22B stripper with brushes.

On September 25, 18 days before the first picking, the defoliant, Def, was applied at the rate of 1 pint per acre to cotton to be picked. The first picking was begun on October 12, one week after a period of wet weather. Fortunately, under these conditions the temperatures were cool enough and cotton plants were sufficiently mature, so no serious regrowth problem developed. At this time the crop was approximately 60- to 70-percent open. The first picking was finished on October 14. The second picking was begun on November 2 and finished on November 6. The period between the first and second picking was ideal for opening of green bolls, and the appearance of this second crop was better than the first.

On October 19 a defoliant was applied to the cotton to be stripped and on October 30 Desiccant L–10 (Pennsalt Chemicals Corp.) was applied to kill the plants. Mild frost occurred during this defoliation period. Good defoliation of the plants was obtained but not good kill, perhaps because of the cool weather. Stripping was begun on November 9 and finished on November 12.

Clemson 1965 crop

The production and harvesting procedures at Clemson in 1965 were similar to those in 1964. A new, low-drum spindle picker, John Deere 22, was used, but the same stripper, Hesston V–22B.

In 1964, the required samples were obtained without undue difficulty. However, the crop opened much more rapidly in 1965, thus lowering the yield from the second picking and necessitating reduced sample sizes.

The first picking was made on September 28 and 29 and October 4; the second picking on October 25, 26, and 29; and stripping on October 28 and 29.

Auburn 1965 crop

Approximately 60 acres were planted in three fields at Auburn during the week of April 19 to 24. All preharvest production practices, except desiccation, were the same for each field.

The harvesters used were a two-row International Harvester 416 picker and a two-row Hesston V–22B stripper.

We planned to defoliate the cotton to be picked when about 60 percent of the bolls were open and begin picking when about 75 percent of the bolls were open. Boll counts made on August 25 showed that only about 40 to 50 percent of the bolls were open. However, hot weather prevailed for the next few days and a boll count on August 30 showed that about 75 percent of the bolls were open. A defoliant consisting of 1 pint of Def and 1½ pints of Accelerate in 25 gallons of water per acre was applied on August 31. We originally planned to defoliate only the cotton to be picked at this time but since such a large percentage of the cotton was open, we defoliated the cotton to be stripped also. Good leaf drop was obtained

and the first picking was made on September 8 when approximately 90 percent of the bolls were open.

The second picking was begun on September 22 and approximately seven bales were harvested before rain fell on September 23. These seven bales were delivered to the ginning laboratory on September 24. The rest of the cotton was picked on September 25 and 26 and delivered on September 27.

Some new growth developed on the cotton to be stripped and a desiccant consisting of 3 pints of Desiccant L–10 arsenic acid in 10 gallons of water per acre was applied on October 2. Good kill was obtained but the scheduled stripping on October 6 was delayed because of 1.15 inches of rain. The cotton was stripped on October 12. Although stripping was later than planned, the cotton was apparently still in good condition at stripping time.

Auburn 1966 crop

Production and harvesting procedures in 1966 were similar to those in 1965. The cotton was planted in three fields during the week of April 11 to 16.

The harvesters used were a one-row International Harvester 501 picker, a one-row John Deere 122 picker, and a two-row Hesston V–22B stripper. No attempt was made to compare the two pickers, and the cotton from these machines was dumped together for the picker bales.

On September 6 a defoliant consisting of 1½ pints of Def in 25 gallons of water per acre was applied to the cotton to be picked. Based on a count of open and green bolls, the defoliant was applied when the cotton was about 65-percent open. However, many of the green bolls either were insect damaged, or were slow in opening, or were destroyed by a hard freeze on November 3. Therefore, about 92 percent instead of the desired 75 percent of the picked cotton was obtained on the first picking.

Fair leaf drop was obtained and the first picking was scheduled for September 12. Part of one field was picked but 4¾ inches of rain, plus occasional showers, delayed the first picking until September 22. The plants were beginning to show considerable new growth at this time.

On October 8 the same defoliant applied on the cotton to be picked was applied on the cotton to be stripped. Good leaf drop was obtained but wet weather and failure of the top bolls to open delayed stripping. On October 29 a desiccant consisting of 3 pints of Desiccant L–10 arsenic acid in 7½ gallons of water per acre was applied. Good leaf kill was obtained and the cotton was stripped on November 1. There was a considerable number of green bolls but most were insect damaged. The green-boll separator on the stripper did a good job of removing most of the bolls. A hard freeze on November 3 destroyed all green bolls.

The second picking was made from November 17 to 21. For reasons already stated, cotton was very thin and the second picking samples for ginning were smaller than the first picking samples.

Ginning

Cotton from each harvesting method was subjected to three ginning treatments in three replications (table 1). For clarity, we have divided the sequence of the order in which the equipment was used into three stages. Note that the first and third stages were the same for all three ginning treatments. Ginning treatments were randomized within replications. In 1964 variations in ginning treatments consisted primarily of placing the stick and green leaf machine at different locations in the machinery sequence. All test lots were processed through a 90-saw gin and two saw-type lint cleaners. Lot sizes were designed to provide at least 350 pounds of lint for spinning tests.

Analysis of ginning performance data from the 1964 study indicated few significant differences between ginning treatments No. 2 and No. 3, which were variations in seed cotton cleaning and extracting equipment. Consequently, treatment No. 3 was modified in 1965 and 1966 to make it similar to No. 1, but with only one lint cleaner. This modification was to provide a difference in foreign matter levels and permit further evaluation of the effectiveness of card crusher rolls used in spinning. Otherwise, ginning procedures were the same in 1965 and 1966 as in 1964.

Drier inlet temperatures and ambient relative humidity during ginning were recorded for each test lot (appendix tables 25, 26, and 27).

Drier inlet temperatures were selected to produce a fiber moisture content of 6 to 8 percent at time of ginning.

During ginning of each lot, samples of seed cotton (wagon and feeder), cottonseed, and ginned lint were drawn to determine moisture and foreign matter contents and various other qualities.

Fiber Tests

Some fiber tests were made by the Southeastern Cotton Ginning Research Laboratory and by the Consumer and Marketing Service's Clemson Laboratory on five samples per bale drawn at intervals during ginning. The samples were mechanically blended and tested by standard procedures.

The bulk of the fiber was tested in the Pilot Spinning Laboratory. There, samples for fiber testing were drawn from each bale when the bale was opened. These samples were tested under standard atmospheric conditions (70° F., 65 percent relative humidity) and by standard fiber-testing procedures.

TABLE 1.—*Sequence of ginning machinery used for picker- and stripper-harvested cotton, 1964 crop* [1]

Ginning treatment—		
No. 1	No. 2 [2]	No. 3 [3]
st stage:		
Wagon	Wagon	Wagon.
eparator No. 1	Separator No. 1	Separator No. 1.
utomatic feed control	Automatic feed control	Automatic feed control.
ower drier No. 1 (TD)	Tower drier No. 1 (TD)	Tower drier No. 1 (TD).
ond stage:		
-cylinder cleaner No. 1 (7C)	Separator No. 2	7-cylinder cleaner No. 1 (7C).
tick and green leaf machine (SM)	Stick and green leaf machine (SM) (burner No. 2 off).	Tower drier No. 2 (TD).
ower drier No. 2 (TD).		7-cylinder cleaner No. 2 (7C).
-cylinder cleaner No. 2 (7C)	7-cylinder cleaner No. 2 (7C)	Separator No. 3.
	Separator No. 3	Distributor.
	Distributor	Overflow (basket).
	Overflow (basket)	Air pickup.
	Air pickup	Separator No. 1.
	Separator No. 1	Automatic feed control (both burners off).
	Automatic feed control.	
	Tower drier No. 1 (TD)	Separator No. 2.
	7-cylinder cleaner No. 1 (7C)	Stick and green leaf machine (SM).
rd stage:		
eparator No. 3	Separator No. 3	Separator No. 3.
istributor	Distributor	Distributor.
eeder	Feeder	Feeder.
0-saw gin	90-saw gin	90-saw gin.
st lint cleaner (1LC)	1st lint cleaner (1LC)	1st lint cleaner (1LC).
d lint cleaner (2LC)	2d lint cleaner (2LC)	2d lint cleaner (2LC).
ondenser	Condenser	Condenser.
int slide	Lint slide	Lint slide.
ale press	Bale press	Bale press.

Ginning treatment No. 3 was modified in 1965 and 6 to include the same seed cotton cleaning and extracting ipment as for No. 1, but with only one lint cleaner.

Burner No. 2 must be off when seed cotton routed from stick and green leaf machine to 7-cylinder cleaner No. 2; therefore, only tower drier No. 1 was used.

[3] Both burners off on 2d pass (1964 only).

Spinning Tests

Each bale was processed individually into a ounce-per-yard picker lap and was carded into 50-grain sliver at 9½ pounds per hour, using d crusher rolls. After the card sliver was proced through breaker and finisher drawing, it s made into a 1.25-hank roving, using a 1.30-st multiplier.

Eight-hour spinning tests were made on each For the 1964 cotton, 40s yarn was spun with .71-twist multiplier at a spindle speed of 11,000 olutions per minute (r.p.m.); and for the 1965 ton, 39s yarn was spun with a 3.71-twist multier at a spindle speed of 12,000 r.p.m. Yarn ts were made for size, skein strength, appearce, and imperfections.

Cotton from the 1966 test was not processed ough pilot plant spinning.

Statistical Analysis

Data for the comparison of harvesting methods d ginning treatments were obtained by the procedure illustrated in figure 1. Samples from each harvesting method were subjected to three ginning treatments, and numerous sampling determinations were made.

Comparisons of the harvesting methods (first machine picking, second machine picking, and stripping) and ginning treatments were made through an analysis of variance for a split-plot experimental design. Each property was analyzed and results from each of the three harvesting methods were kept separate. The main plot factor was harvesting methods. Subplots were the three ginning treatments. Duncan's Multiple Range Test was used to determine which differences were significant among a set of treatment means. This procedure may be used, regardless of the significance of the F-ratio in an analysis of variance.[3] It sometimes shows differences to be significant at a given protection level although the F-ratio in the analysis of variance does not.

[3] STEEL, R. G., and TORRIE, J. H. PRINCIPLES AND PROCEDURES OF STATISTICS. 481 pp., illus. McGraw-Hill Book Co., Inc., New York and Toronto. 1960.

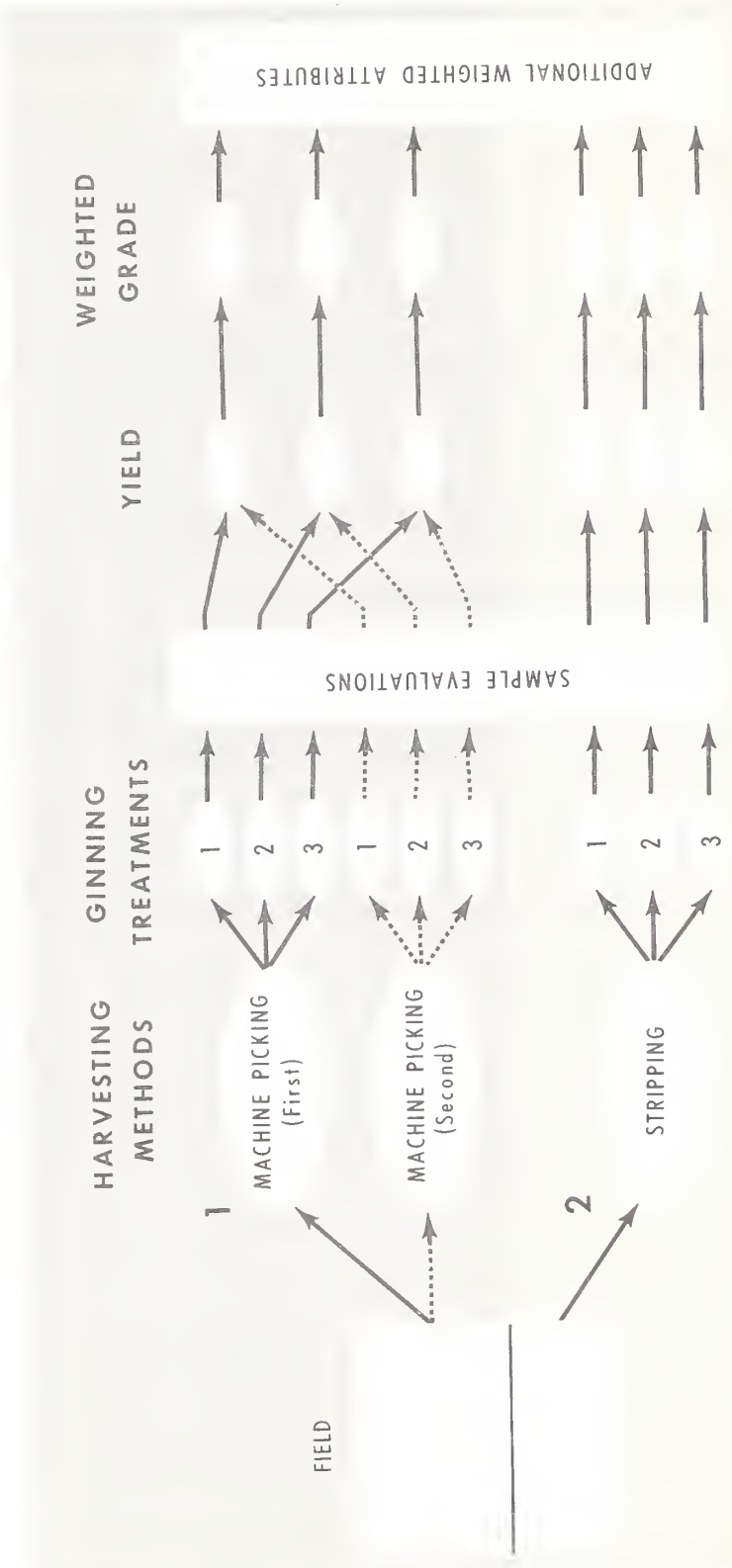

FIGURE 1.—Procedure for obtaining data to evaluate machine picking versus machine stripping.

Comparisons based on two methods of harvest (machine picking and stripping) for such factors as yield of seed cotton per acre were made in a straightforward manner. However, special procedures were necessary for comparisons of the two methods on the basis of fiber and spinning performance data. Quality factors for the first machine picking and the second machine picking were weighted by yield, and a new analysis of variance was completed. This comparison was made in those cases in which first machine picking and second machine picking were significantly different or differed in their relationship to the stripping.

As an example of the weighting procedure, the break factor values for first and second pickings were multiplied by the respective yields of lint cotton per acre. The two resulting values were added and the result was divided by the total lint yield per acre. This weighted break factor was obtained for each of the three ginning treatments. These values were then compared with those obtained from the stripping.

Analyses were investigated further when the interaction between ginning treatments and harvesting methods was significant. In some instances, a covariance analysis was made, involving a separate variable that might affect the comparisons.

It was necessary to be selective in presenting results of statistical analyses. Generally, only the statistically significant results and those of special interest in a ginning-spinning study are shown. Most of the significant results discussed in the report are shown in tables.

RESULTS AND DISCUSSION

Yield and Returns

The 1964–65 averages for wagon sample foreign matter content at Clemson for first machine picked, second machine picked, and stripper-harvested seed cotton were 3.13 percent, 4.98 percent, and 25.50 percent, respectively (table 2). The 1965–66 averages at Auburn for these three harvesting methods were 4.72 percent, 13.32 percent, and 25.70 percent, respectively (table 2). Total foreign matter content for the stripped cotton for both years at both locations was approximately 25.5 percent.

The 18.64-percent foreign matter content of the second lot of picked cotton at Auburn in 1966 was unusually high, partly because of an early freeze on November 3. However, this picking accounted for only 9 percent of the total picked cotton.

Data on returns based on yield and value per acre are shown in tables 3, 4, and 5 with comparisons available for the 3-year study.

The stripper returned $42.78 more per acre than the picker at Clemson in 1964, and $22.91 more per acre in 1965, for an average return of $32.85 per acre in favor of the stripper (table 3).

TABLE 2.—*Foreign matter content of wagon samples of Auburn 56 variety cotton as determined by the fractionation method from Clemson, S.C., 1964 and 1965, and from Auburn, Ala., 1965 and 1966*

Operation	Burs	Sticks	Grass	Large leaf	Small leaf	Motes	Total trash
1st machine picking:	*Percent*	*Percent*	*Percent*	*Percent*	*Percent*	*Percent*	*Percent*
Clemson 1964	1. 11	0. 27	0. 17	0. 59	0. 73	0. 71	3. 58
Clemson 1965	. 70	. 22	. 03	. 25	. 64	. 84	2. 68
Auburn 1965	1. 69	. 40	. 10	. 53	1. 48	. 82	5. 04
Auburn 1966	1. 17	. 26	. 05	. 88	1. 43	. 60	4. 39
2d machine picking:							
Clemson 1964	1. 69	. 42	. 10	. 24	. 47	. 83	3. 69
Clemson 1965	1. 85	. 86	. 56	. 44	. 98	1. 57	6. 27
Auburn 1965	2. 60	. 51	. 41	1. 58	1. 78	1. 12	8. 00
Auburn 1966	4. 88	1. 48	. 09	3. 43	4. 15	4. 61	18. 64
Stripping:							
Clemson 1964	17. 46	4. 11	. 27	1. 70	. 65	1. 36	25. 54
Clemson 1965	17. 04	3. 60	. 41	1. 03	1. 03	2. 34	25. 45
Auburn 1965	16. 20	3. 24	. 25	1. 88	2. 49	1. 18	25. 25
Auburn 1966	16. 92	2. 53	. 17	3. 10	1. 98	1. 44	26. 15

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TABLE 3.—*Returns per acre, based on yields and values, of Auburn 56 variety cotton from Clemson, S.C., 1964 and 1965*

Operation	Yield per acre			Value per acre		
	Seed cotton [1]	Lint	Bales [2]	Seed [3]	Lint [4]	Total
	Pounds	*Pounds*	*Number*	*Dollars*	*Dollars*	*Dollars*
1st machine picking:						
Clemson 1964	1, 687	573. 6	1. 20	23. 69	179. 39	203. 08
Clemson 1965	2, 321	775. 2	1. 62	33. 02	223. 72	256. 74
Average	2, 004	674. 4	1. 41	28. 36	201. 56	229. 91
2d machine picking:						
Clemson 1964	787	266. 8	. 56	11. 54	80. 66	92. 20
Clemson 1965	539	176. 3	. 37	6. 92	49. 99	56. 91
Average	663	221. 6	. 46	9. 23	65. 32	74. 56
Total machine picking:						
Clemson 1964	2, 474	840. 4	1. 76	35. 23	260. 05	295. 28
Clemson 1965	2, 860	951. 5	1. 99	39. 94	273. 71	313. 65
Average	2, 667	896. 0	1. 87	37. 59	266. 88	304. 47
Stripping:						
Clemson 1964	4, 021	1, 016. 1	2. 13	43. 54	294. 52	338. 06
Clemson 1965	4, 164	1, 074. 3	2. 25	43. 72	292. 84	336. 56
Average	4, 092	1, 045. 2	2. 19	43. 63	293. 68	337. 31

[1] Seed cotton yields include trash.

[2] Gross weight of one bale is 500 pounds, including 22 pounds of tare for bagging and ties.

[3] Seed values computed by multiplying weight by $50 per ton.

[4] Lint values computed by multiplying gross bale weight by CCC price per pound, based on Smith-Doxey Classification. CCC loan price for Middling 1-inch was 30.84 cents per pound in 1964 and 29.52 cents per pound in 1965.

The picker returned $2.87 more per acre than the stripper at Auburn in 1965, and $27.09 more per acre in 1966, for an average return of $14.98 in favor of the picker (table 4). Although some data were recorded regarding harvesting and ginning costs, evaluation of these data was not attempted because of field conditions and other limitations. However, an indication of increased ginning cost for the stripper can be obtained from its 3-year average ginning rate of 7.66 pounds per saw per hour compared with 9.51 pounds for the picker. Ginning rate of the picked cotton was about 24 percent greater than the stripped cotton.

Table 5 summarizes tables 3 and 4 and indicates that the stripper returned $8.93 more per acre than the picker when 2 years' data from each of the two locations were averaged. However, this figure is subject to a wide margin of error because of the differences in field conditions, yields, harvester efficiencies, and other uncontrolled factors over the 3 years and between the two locations. Yield data in tables 3 and 4 indicate that much of the variation in gross returns was the result of differences in overall picker and stripper efficiencies. As reported by Corley and Kirk,[4] gross value comparison of the two machines does not take into consideration differences in initial cost and operational expense. They reported that this may be 2 to 3 cents per pound of lint lower for the stripper than the picker, but that additional trash of the stripped cotton will increase ginning and handling costs and desiccation will increase production costs for the stripper, totaling as much as 1 to 1½ cents per pound. Also the result needs some qualification because CCC loan prices were used for all cottons. This assumes that the stripped cotton would sell in the same market as picked cotton. In today's market, spot prices for most picked cotton are considerably above CCC loan levels. Thus, the apparent advantage to stripped cotton would disappear if, because of inferior processing qualities, it did not sell in the open market.

Appendix tables 28, 29, 30, and 31 show bale weights, grades, and staple lengths of individual test bales. Appendix table 32 shows grades and staple lengths by harvesting methods each year for the two locations, with grade comparisons both before and after reductions by the classer. Grades and staples in these tables were obtained from cut samples sent to the Consumer and Marketing Service's Columbia Classing Office, Columbia, S.C. For statistical analysis of grade and staple length, five subsamples were drawn from inside each bale, and classification was by a committee at the Columbia Classing Office.

[4] See footnote 2, page 2.

TABLE 4.—*Returns per acre, based on yields and values, of Auburn 56 variety cotton from Auburn, Ala., 1965 and 1966*

Operation	Yield per acre			Value per acre		
	Seed cotton [1]	Lint	Bales [2]	Seed [3]	Lint [4]	Total
	Pounds	*Pounds*	*Number*	*Dollars*	*Dollars*	*Dollars*
1st machine picking:						
Auburn 1965	2, 294	839. 6	1. 76	31. 08	246. 14	277. 22
Auburn 1966	1, 687	563. 5	1. 18	23. 95	114. 34	138. 29
Average	1, 990	701. 6	1. 47	27. 52	180. 24	207. 76
2d machine picking:						
Auburn 1965	216	73. 0	. 15	2. 78	20. 58	23. 36
Auburn 1966	166	49. 5	. 10	1. 85	8. 12	9. 97
Average	191	61. 2	. 12	2. 32	14. 35	16. 67
Total machine picking:						
Auburn 1965	2, 510	912. 6	1. 91	33. 86	266. 72	300. 58
Auburn 1966	1, 853	613. 0	1. 28	25. 80	122. 46	148. 26
Average	2, 181	762. 8	1. 59	29. 84	194. 59	224. 43
Stripping:						
Auburn 1965	3, 338	921. 3	1. 93	34. 55	263. 16	297. 71
Auburn 1966	2, 408	556. 3	1. 16	24. 02	97. 15	121. 17
Average	2, 873	738. 8	1. 54	29. 28	180. 16	209. 44

[1] Seed cotton yields include trash.

[2] Gross weight of one bale is 500 pounds, including 22 pounds of tare for bagging and ties.

[3] Seed values computed by multiplying weight by $50 per ton.

[4] Lint values computed by multiplying gross bale weight by CCC price per pound, based on Smith-Doxey Classification. CCC loan price for Middling 1-inch was 29.52 cents per pound in 1965 and 21.50 cents per pound in 1966.

TABLE 5.—*Average returns per acre, based on yields and values, of Auburn 56 variety cotton from Clemson, S.C., 1964 and 1965; from Auburn, Ala., 1965 and 1966; and averages for the two locations, 1964–66*

Operation	Yield per acre			Value per acre		
	Seed cotton [1]	Lint	Bales [2]	Seed [3]	Lint [4]	Total
	Pounds	*Pounds*	*Number*	*Dollars*	*Dollars*	*Dollars*
1st machine picking:						
Clemson 1964–65	2, 004	674. 4	1. 41	28. 36	201. 56	229. 91
Auburn 1965–66	1, 990	701. 6	1. 47	27. 52	180. 24	207. 76
Average	1, 997	688. 0	1. 44	27. 94	190. 90	218. 84
2d machine picking:						
Clemson 1964–65	663	221. 6	. 46	9. 23	65. 32	74. 56
Auburn 1965–66	191	61. 2	. 12	2. 32	14. 35	16. 67
Average	427	141. 4	. 29	5. 78	39. 84	45. 62
Total machine picking:						
Clemson 1964–66	2, 667	896. 0	1. 87	37. 59	266. 88	304. 47
Auburn 1965–66	2, 181	762. 8	1. 59	29. 84	194. 59	224. 43
Average	2, 424	829. 4	1. 73	33. 72	230. 74	264. 45
Stripping:						
Clemson 1964–65	4, 092	1, 045. 2	2. 19	43. 63	293. 68	337. 31
Auburn 1965–66	2, 873	738. 8	1. 54	29. 28	180. 16	209. 44
Average	3, 482	892. 0	1. 86	36. 46	236. 92	273. 38

[1] Seed cotton yields include trash.

[2] Gross weight of one bale is 500 pounds, including 22 pounds of tare for bagging and ties.

[3] Seed values computed by multiplying weight by $50 per ton.

[4] Lint values computed by multiplying gross bale weight by CCC price per pound, based on Smith-Doxey Classification. CCC loan price for Middling 1-inch was 30.84 cents per pound in 1964, 29.52 cents per pound in 1965, and 21.50 cents per pound in 1966.

Harvesting and Ginning

Clemson 1964 crop

The effects of harvesting methods and ginning treatments on mositure and foreign matter content (table 6 and appendix table 33); on classification (grade and staple length), CCC price per pound (unit lint value), total waste (lint foreign matter), linters content, and Colorimeter determinations (reflectance, R_d, and yellowness, +b) (table 7); and on ginning rate, trash removal, bale weight, and bale value (table 8), all were determined for cotton from Clemson, S.C., in 1964. Statistically significant differences were obtained from analysis of variance procedures explained previously.

Lint moisture contents were very close to the range desired, averaging 6.14 percent for the first picking, 5.55 percent for the second, and 5.93 for the stripping (table 6). These lint moistures were obtained from wagon moisture contents of 14.39 percent, 9.77 percent, and 11.52 percent, respectively (appendix table 33).

Seed moisture contents averaged 11.13 percent for the first picking, 10.03 percent for the second, and 10.92 for the stripping. All seed moisture contents indicated firm seed at time of ginning.

Of the 45 subsamples from the 9 bales of Clemson 1964 stripper-harvested cotton, 34 were reduced in grade because of bark or grass content, and 8 others showed a trace of grass or bark, but were not reduced.

The composite grade index of the machine-picked cotton was 94.0 or Strict Low Middling (table 7). Before reductions, the composite grade index of the stripped cotton averaged 91.0 for ginning treatment No. 1; 92.2 for No. 2; and 88.0 for No. 3. After reduction, these indices were 84.4, 84.4, and 80.2, respectively. Staple lengths were practically the same for all picked and stripped cotton, averaging 33.6 for the first picking, 34.1 for the second, and 34.0 for the stripping.

Typical grade designations and abbreviations, and the corresponding grade indices are as follows:

Grade designation	*Index*
Middling (M)	100
Strict Low Middling Plus (SLM+)	97
Strict Low Middling (SLM)	94
Low Middling Plus (LM+)	90
Low Middling (LM)	85
Strict Good Ordinary Plus (SGO+)	81
Strict Good Ordinary (SGO)	76
Good Ordinary Plus (GO+)	73
Good Ordinary (GO)	70
Below Grade (BG)	60

TABLE 6.—*Effect of harvesting methods and ginning treatments on moisture content of fiber and seed and on foreign matter content of Auburn 56 variety seed cotton from Clemson, S.C., 1964 ginning tests*

Operation	Fiber moisture content			Seed moisture content	Foreign matter content	
	Initial	Feeder apron	Lint slide		Wagon	Feeder apron
	Percent	*Percent*	*Percent*	*Percent*	*Percent*	*Percent*
Harvesting:						
1st machine picking (No. 1)	8. 60	5. 82	6. 14	11. 13	3. 58	0. 83
2d machine picking (No. 2)	6. 76	5. 48	5. 55	10. 03	3. 69	1. 04
Stripping (No. 3)	7. 46	5. 49	5. 93	10. 92	25. 54	4. 11
Significance level [1]	n.s.	n.s.	n.s.	n.s.	. 01	. 01
Duncan's Range, 0.10 [2]	2<1			2<1	1, 2<3	1, 2<8
Duncan's Range, 0.05 [2]	2<1				1, 2<3	1, 2<7
Machine picking, weighted average	8. 02	5. 72	5. 95	10. 78	3. 61	0. 91
Stripping	7. 46	5. 49	5. 93	10. 92	25. 54	4. 11
Significance level [1]	n.s.	n.s.	n.s.	n.s.	. 01	. 03
Ginning: [3]						
Treatment No. 1	7. 63	5. 41	5. 81	10. 78	10. 69	2. 01
Treatment No. 2	7. 73	5. 53	5. 85	10. 69	11. 04	2. 12
Treatment No. 3	7. 46	5. 85	5. 96	10. 60	11. 08	1. 93
Significance level [1]	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.
Duncan's Range, 0.10 [2]						
Duncan's Range, 0.05 [2]						

[1] n.s. means not significant, 0.05 means significant at the 5-percent level of probability, and 0.01 means significant at the 1-percent level of probability, based on analysis of variance.

[2] The means are arrayed in ascending order by treatment number, based on significance by Duncan's Multiple Range Tests at the probability level indicated. The symbol < means less than.

[3] No. 1=TD-7C-SM-TD-7C-Gin-1LC-2LC. No. 2=TD-SM-7C-TD-7C-Gin-1LC-2LC. No. 3=TD-7C-TD-7C-SM-Gin-1LC-2LC.

TABLE 7.—*Effect of harvesting methods and ginning treatments on classification, CCC price per pound, Shirley Analyzer waste, linters content, and Colorimeter determinations of Auburn 56 variety cotton from Clemson, S.C., 1964 ginning tests*

Operation	Classification		CCC price per pound	Shirley Analyzer total waste	Linters content	Colorimeter determinations	
	Grade [1]	Staple length				Reflectance (R_d)	Yellowness (+b)
	Index	*32d inch*	*Cents*	*Percent*	*Percent*	*Units*	*Units*
Harvesting:							
1st machine picking (No. 1)	94. 0	33. 6	30. 19	3. 09	10. 5	72. 9	8. 7
2d machnie picking (No. 2)	94. 0	34. 1	30. 51	3. 42	10. 9	75. 9	7. 8
Stripping (No. 3)	83. 0	34. 0	27. 92	4. 87	10. 7	74. 5	7. 7
Significance level [2]	. 01	n.s.	. 01	. 05	n.s.	. 05	. 01
Duncan's Range, 0.10 [3]	3<2, 1	----------	3<1, 2	1, 2<3	1<2	1<3<2	3, 2<1
Duncan's Range, 0.05 [3]	3<2, 1	----------	3<1, 2	1, 2<3	1<2	1<3<2	3, 2<1
Machine picking, weighted average	94. 0	33. 7	30. 29	3. 19	10. 6	73. 8	8. 4
Stripping	83. 0	34. 0	27. 92	4. 87	10. 7	74. 5	7. 7
Significance level [2]	. 05	n.s.	. 05	. 05	n.s.	n.s.	. 01
Ginning: [4]							
Treatment No. 1	90. 8	33. 9	29. 67	3. 86	10. 8	74. 5	8. 1
Treatment No. 2	90. 8	34. 0	29. 69	3. 67	10. 6	74. 4	8. 0
Treatment No. 3	89. 4	33. 8	29. 25	3. 85	10. 7	74. 4	8. 1
Significance level [2]	n.s.	n.s.	. 05	n.s.	n.s.	n.s.	n.s.
Duncan's Range, 0.10 [3]	3<2, 1	----------	3<1, 2	----------	----------	----------	----------
Duncan's Range, 0.05 [3]	3<2, 1	----------	3<1, 2	----------	----------	----------	----------

[1] See leaderwork, page 10, for names and values for various grade indices.

[2] n.s. means not significant, 0.05 means significant at the 5-percent level of probability, and 0.01 means significant at the 1-percent level of probability, based on analysis of variance.

[3] The means are arrayed in ascending order by treatment number, based on significance by Duncan's Multiple Range Tests at the probability level indicated. The symbol < means less than.

[4] No. 1=TD-7C-SM-TD-7C-Gin-1LC-2LC. No. 2=TD-SM-7C-TD-7C-Gin-1LC-2LC. No. 3=TD-7C-TD-7C-SM-Gin-1LC-2LC.

In a comparison of the three ginning treatments, the only significant difference was in CCC price in cents per pound (unit lint value). The price per pound averaged 29.25 cents for treatment No. 3, or 43 points less than the average for treatments No. 1 and No. 2 (29.67 cents and 29.69 cents).

Ginning rate of the picked cotton was 27 percent greater than that of the stripped cotton (table 8). The ginning treatments had no effect on ginning rate, trash removal, bale weights, or bale values.

The significant interaction between harvesting and ginning for composite grade index indicated that the grade of stripped cotton was slightly higher for ginning treatments No. 1 and No. 2 than for No. 3; but the differences were small. All grades were the same among picked cottons.

Clemson and Auburn 1965 crop

The effects of harvesting methods and ginning treatments on moisture and foreign matter content (tables 9 and 12 and appendix table 33); on classification (grade and staple length), CCC price per pound (unit lint value), total waste (lint foreign matter), linters content, and Colorimeter determinations (reflectance, R_d, and yellowness, +b) (tables 10 and 13); and on ginning rate, trash removal, bale weights, and bale values (tables 11 and 14), all were determined for cotton from Clemson, S.C., and Auburn, Ala., in 1965.

CLEMSON 1965.—Lint moisture contents were close to the range desired, averaging 6.51 percent for the first picking, 4.97 percent for the second, and 4.78 percent for the stripping (table 9). These lint moistures were obtained from wagon moisture contents of 12.85 percent, 9.08 percent, and 10.56 percent, respectively (appendix table 33).

Seed moisture contents averaged 13.09 percent for the first picking, 9.76 percent for the second, and 10.62 percent for the stripping. All seed moisture contents indicated firm seed at time of ginning.

Of the 45 subsamples from the nine bales of Clemson 1965 first-picked cotton, 25 were reduced in grade because of preparation, and 11 others showed a trace of grass or bark, but were not reduced. Of the second-picked cotton, seven were reduced because of grass or bark, and 17 others showed a trace of grass or bark, but were not reduced. Of the stripped cotton, 40 were reduced in grade because of bark content, and two others showed a trace of grass, but were not reduced.

TABLE 8.—*Effect of harvesting methods and ginning treatments on ginning rate, trash removal per bale, bale weights, and bale values of Auburn 56 variety cotton from Clemson, S.C., 1964 ginning tests*

Operation	Ginning rate per saw per hour	Trash removed [1]		Total trash removed [1]	Weight [2]		Value [2]	
		By seed cotton machinery	By lint cleaners		Adjusted gross per bale	Per seed cotton unit	Adjusted gross per bale	Per seed cotton unit
	Pounds	*Percent*	*Percent*	*Percent*	*Pounds*	*Pounds*	*Pounds*	*Dollars*	*Dollars*
Harvesting:									
1st machine picking (No. 1)	8. 6	4. 1	0. 6	4. 7	70. 8	493. 7	546. 9	146. 00	161. 72
2d machine picking (No. 2)	8. 4	4. 4	. 7	5. 1	76. 1	494. 6	544. 7	141. 04	155. 33
Stripping (No. 3)	6. 7	25. 9	. 9	26. 8	534. 9	502. 7	539. 2	139. 15	149. 43
Significance level [3]	. 01	. 01	. 01	. 01	. 01	n.s.	n.s.	n.s.	. 05
Duncan's Range, 0.10 [4]	3<2,1	1,2<3	1,2<3	1<2<3	1,2<3			3,2<1	3<2<1
Duncan's Range, 0.05 [4]	3<2,1	1,2<3	1,2<3	1<2<3	1,2<3			3,2<1	3<2<1
Machine picking, weighted average	8. 5	4. 2	. 7	4. 9	72. 5	494. 0	546. 2	144. 42	159. 69
Stripping	6. 7	25. 9	. 9	26. 8	534. 9	502. 7	539. 2	139. 15	149. 43
Significance level [3]	. 01	. 01	. 01	0. 1	. 01	n.s.	n.s.	n.s.	n.s.
Ginning: [5]									
Treatment No. 1	7. 8	11. 3	. 7	12. 0	223. 9	497. 5	542. 9	141. 56	154. 64
Treatment No. 2	7. 9	11. 7	. 7	12. 4	231. 5	496. 5	544. 2	142. 00	155. 72
Treatment No. 3	8. 0	11. 4	. 8	12. 2	226. 4	497. 0	543. 7	142. 63	156. 13
Significance level [3]	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.
Duncan's Range, 0.10 [4]									
Duncan's Range, 0.05 [4]									

[1] Percentages of trash removed by seed cotton machinery and lint cleaners based on original seed cotton weight.

[2] Adjusted gross weights and bale values computed on basis of control bale at 7-percent lint moisture and 3.5-percent lint foreign matter. Bale weights and values per seed cotton unit computed on basis of 1,500 pounds of seed cotton for machine picking and 2,000 pounds for stripping.

[3] n.s. means not significant, 0.05 means significant at the 5-percent level of probability, and 0.01 means significant at the 1-percent level of probability, based on analysis of variance.

[4] The means are arrayed in ascending order by treatment number, based on significance by Duncan's Multiple Range Tests at the probability level indicated. The symbol < means less than.

[5] No. 1=TD-7C-SM-TD-7C-Gin-1LC-2LC. No. 2=TD-SM-7C-TD-7C-Gin-1LC-2LC. No. 3=TD-7C-TD-7C-SM-Gin-1LC-2LC.

The composite grade index of the picked cotton averaged 87.8 or just above Low Middling (table 10). Before reductions, the composite grade index of the stripped cotton averaged 92.0 for ginning treatment No. 1; 89.9 for No. 2; and 90.7 for No. 3. After reductions, these indices were 83.0, 83.9 and 81.7, respectively. Staple lengths were in a narrow range for all picked and stripped cotton, averaging 34.4 for the first picking, 33.2 for the second, and 34.0 for the stripping.

Although significant, the ginning treatment differences were relatively small. Samples in treatments No. 1 and No. 2 had higher bur content at the feeder apron than in treatment No. 3. Samples in No. 2 had lower small leaf and mote content at the feeder apron, lower Shirley Analyzer visible and total waste, higher Colorimeter yellowness (+b), and lower adjusted gross bale weight and bale weight per seed cotton unit than in No. 1 and No. 3. These measurements indicated more effective cleaning by No. 2, in which the stick and green leaf machine was placed first in the system. Samples in No. 3 exhibited slightly longer staple length than in No. 1 and No. 2. Trash percentage removed by lint cleaners, based on a percentage of total seed cotton weight, averaged 0.83 for No. 1; 0.74 for No. 2; and 0.51 for No. 3, with all differences being significant (table 11).

The significant interactions between harvesting and ginning for adjusted gross bale weight, Shirley Analyzer total waste, and linters content indicated inconsistent values for these items. However, the inconsistencies did not materially affect results since they either were small or reflected a small inconsistency in the magnitude of differences among sets of means.

AUBURN 1965.—Lint moisture contents were well within the desired range, averaging 6.21 percent for the first picking, 6.30 percent for the second, and 6.09 percent for the stripping (table

TABLE 9.—*Effect of harvesting methods and ginning treatments on moisture content of fiber and seed and on foreign matter content of Auburn 56 variety seed cotton from Clemson, S.C., 1965 ginning tests*

Operation	Fiber moisture content			Seed moisture content	Foreign matter content	
	Initial	Feeder apron	Lint slide		Wagon	Feeder apron
Harvesting:	*Percent*	*Percent*	*Percent*	*Percent*	*Percent*	*Percent*
1st machine picking (No. 1)	8. 72	6. 71	6. 51	13. 09	2. 68	1. 01
2d machine picking (No. 2)	6. 52	5. 50	4. 97	9. 76	6. 27	1. 40
Stripping (No. 3)	6. 56	5. 45	4. 78	10. 62	25. 45	3. 64
Significance level [1]	n.s.	n.s.	n.s.	n.s.	. 01	. 01
Duncan's Range, 0.10 [2]	2,3<1	3,2<1	3,2<1	2,3<1	1<2<3	1,2<3
Duncan's Range, 0.05 [2]	2,3<1	----------	3,2<1	2,3<1	1<2<3	1,2<3
Machine picking, weighted average	8. 31	6. 48	6. 22	12. 46	3. 35	1. 08
Stripping	6. 56	5. 45	4. 78	10. 62	25. 45	3. 64
Significance level [1]	n.s.	n.s.	n.s.	n.s.	. 01	. 05
Ginning: [3]						
Treatment No. 1	7. 36	6. 19	5. 71	11. 28	11. 35	2. 10
Treatment No. 2	7. 31	5. 55	5. 07	11. 13	11. 15	1. 90
Treatment No. 3	7. 13	5. 93	5. 48	11. 06	11. 90	2. 04
Significance level [1]	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.
Duncan's Range, 0.10 [2]	----------	2<1	2<1	----------	----------	----------
Duncan's Range, 0.05 [2]	----------	2<1	----------	----------	----------	----------

[1] n.s. means not significant, 0.05 means significant at the 5-percent level of probability, and 0.01 means significant at the 1-percent level of probability, based on analysis of variance.

[2] The means are arrayed in ascending order by treatment number, based on significance by Duncan's Multiple Range Tests at the probability level indicated. The symbol < means less than.

[3] No. 1=TD-7C-SM-TD-7C-Gin-1LC-2LC. No. 2=TD-SM-7C-TD-7C-Gin-1LC-2LC. No.3=TD-7C-SM-TD-7C-Gin-1LC.

TABLE 10.—*Effect of harvesting methods and ginning treatments on classification, CCC price per pound, Shirley Analyzer waste, linters content, and Colorimeter determinations of Auburn 56 variety cotton from Clemson, S.C., 1965 ginning tests*

Operation	Classification		CCC price per pound	Shirley Analyzer total waste	Linters content	Colorimeter determinations	
	Grade [1]	Staple length				Reflectance (R_d)	Yellowness (+b)
	Index	*32d inch*	*Cents*	*Percent*	*Percent*	*Units*	*Units*
Harvesting:							
1st machine picking (No. 1)	87. 0	34. 4	27. 64	3. 92	10. 1	74. 7	8. 4
2d machine picking (No. 2)	91. 4	33. 2	28. 22	3. 98	9. 5	74. 0	7. 7
Stripping (No. 3)	82. 8	34. 0	26. 37	5. 15	10. 1	74. 0	7. 3
Significance level [2]	. 05	. 01	n.s.	n.s.	n.s.	n.s.	. 01
Duncan's Range, 0.10 [3]	3<1<2	2<3<1	3<1, 2	1, 2<3	----------	3, 2<1	3<2<1
Duncan's Range, 0.05 [3]	3<2	2<3<1	3<1, 2	1, 2<3	----------	----------	3<2<1
Machine picking, weighted average	87. 8	34. 2	27. 76	3. 93	10. 0	74. 6	8. 3
Stripping	82. 8	34. 0	26. 37	5. 15	10. 1	74. 0	7. 3
Significance level [2]	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.	. 01
Ginning: [4]							
Treatment No. 1	86. 7	33. 8	27. 33	4. 32	10. 0	74. 4	7. 8
Treatment No. 2	88. 1	33. 8	27. 62	3. 91	9. 9	74. 4	7. 9
Treatment No. 3	86. 4	34. 0	27. 28	4. 82	9. 8	73. 9	7. 8
Significance level [2]	n.s.	. 05	n.s.	. 01	n.s.	n.s.	. 01
Duncan's Range, 0.10 [3]	----------	1, 2<3	----------	2<1<3	----------	----------	3, 1<2
Duncan's Range, 0.05 [3]	----------	----------	----------	2<1<3	----------	----------	3, 1<2

[1] See leaderwork, page 10, for names and values for various grade indices.

[2] n.s. means not significant, 0.05 means significant at the 5-percent level of probability, and 0.01 means significant at the 1-percent level of probability, based on analysis of variance.

[3] The means are arrayed in ascending order by treatment number, based on significance by Duncan's Multiple Range Tests at the probability level indicated. The symbol < means less than.

[4] No. 1=TD-7C-SM-TD-7C-Gin-1LC-2LC. No. 2=TD-SM-7C-TD-7C-Gin-1LC-2LC. No. 3=TD-7C-SM-TD-7C-Gin-1LC.

TABLE 11.—*Effect of harvesting methods and ginning treatments on ginning rate, trash removal per bale, bale weights, and bale values of Auburn 56 variety cotton from Clemson, S.C., 1965 ginning tests*

Operation	Ginning rate per saw per hour	Trash removed [1]		Weight [2]		Value [2]	
		By seed cotton machinery	By lint cleaners	Adjusted gross per bale	Per seed cotton unit	Adjusted gross per bale	Per seed cotton unit
	Pounds	*Percent*	*Percent*	*Pounds*	*Pounds*	*Dollars*	*Dollars*
Harvesting:							
1st machine picking (No. 1)	9. 35	62. 29	0. 53	500. 2	501. 4	138. 26	138. 56
2d machine picking (No. 2)	10. 20	77. 13	. 72	493. 9	540. 1	139. 37	152. 46
Stripping (No. 3)	7. 23	85. 71	. 83	499. 8	515. 6	131. 74	136. 05
Significance level [3]	. 01	. 05	. 01	n.s.	n.s.	n.s.	n.s.
Duncan's Range, 0.10 [4]	3<1<2	1<2<3	1<2<3	----------	1<2	3<1, 2	3, 1<2
Duncan's Range, 0.05 [4]	3<1<2	1<2, 3	1<2<3	----------	1<2	3<1, 2	3<2
Machine picking, weighted average	9. 51	65. 08	. 57	499. 0	508. 7	138. 46	141. 18
Stripping	7. 23	85. 71	. 83	499. 8	515. 6	131. 74	136. 05
Significance level [3]	. 05	. 05	. 05	n.s.	n.s.	n.s.	n.s.
Ginning: [5]							
Treatment No. 1	8. 89	74. 69	. 83	500. 3	523. 1	136. 75	143. 08
Treatment No. 2	8. 92	76. 54	. 74	493. 4	508. 6	136. 25	140. 60
Treatment No. 3	8. 97	73. 90	. 51	500. 2	525. 4	136. 37	143. 38
Significance level [3]	n.s.	n.s.	. 01	. 01	. 05	n.s.	n.s.
Duncan's Range, 0.10 [4]	----------	----------	3<2<1	2<3, 1	2<1, 3	----------	----------
Duncan's Range, 0.05 [4]	----------	----------	3<2<1	2<3, 1	2<1, 3	----------	----------

[1] Percentages of trash removed by seed cotton machinery based on fractionation data from wagon and feeder samples; percentages of trash removed by lint cleaners based on original seed cotton weight.

[2] Adjusted gross weights and bale values computed on basis of control bale at 7-percent lint moisture and 3.5-percent lint foreign matter. Bale weights and values per seed cotton unit computed on basis of 1,500 pounds of seed cotton for machine picking and 2,000 pounds for stripping.

[3] n.s. means not significant, 0.05 means significant at the 5-percent level of probability, and 0.01 means significant at the 1-percent level of probability, based on analysis of variance.

[4] The means are arrayed in ascending order by treatment number, based on significance by Duncan's Multiple Range Tests at the probability level indicated. The symbol < means less than.

[5] No. 1=TD-7C-SM-TD-7C-Gin-1LC-2LC. No. 2=TD-SM-7C-TD-7C-Gin-1LC-2LC. No. 3=TD-7C-SM-TD-7C-Gin-1LC.

12). These lint moistures were obtained from wagon moisture contents of 8.62 percent, 10.36 percent, and 9.42 percent, respectively (appendix table 33).

Seed moisture contents averaged 8.90 percent for the first picking, 11.01 percent for the second, and 9.60 percent for the stripping. All seed moisture contents indicated firm seed at time of ginning.

Of the 45 subsamples from the nine bales of Auburn 1965 first-picked cotton, four were reduced in grade because of grass content, and 25 others showed a trace of grass, but were not reduced. Of the second-picked cotton, 27 were reduced because of preparation, grass, or bark, and 15 others showed a trace of grass or bark, but were not reduced. Of the stripped cotton, all were reduced in grade from Low Middling to Strict Good Ordinary because of bark content.

The composite grade index of the picked cotton averaged 93.1 or Strict Low Middling (table 13). Before reductions, the composite grade index of the stripped cotton averaged 85.0, or Low Middling. After reductions, these indices averaged 76.0, or Strict Good Ordinary. Staple lengths were practically the same for all picked and stripped test lots, averaging 34.1 for the first picking, 34.2 for the second, and 33.9 for the stripping.

Although significant, the ginning treatment differences were relatively small. Samples in treatment No. 1 had lowest lint moisture content, highest ginning rate, and highest trash removed by lint cleaners. Samples in treatment No. 2 had lowest Shirley Analyzer total waste and lowest ginning rate. Samples in treatment No. 3 had highest lint moisture and Shirley Analyzer total waste, lowest Colorimeter reflectance (R_d) and trash percentage removed by lint cleaners, and highest adjusted gross bale weight (table 14). As with the Clemson 1964 and 1965 cotton, the above measurements indicated more effective cleaning when the stick and green leaf machine was placed first in the system.

TABLE 12.—*Effect of harvesting methods and ginning treatments on moisture content of fiber and seed and on foreign matter content of Auburn 56 variety seed cotton from Auburn, Ala., 1965 ginning tests*

Operation	Fiber moisture content			Seed moisture content	Foreign matter content	
	Initial	Feeder apron	Lint slide		Wagon	Feeder apron
Harvesting:	*Percent*	*Percent*	*Percent*	*Percent*	*Percent*	*Percent*
1st machine picking (No. 1)	6.78	6.48	6.21	8.90	5.04	0.88
2d machine picking (No. 2)	7.36	6.64	6.30	11.01	8.00	1.73
Stripping (No. 3)	6.75	6.34	6.09	9.60	25.25	3.25
Significance level [1]	n.s.	n.s.	n.s.	n.s.	.01	.01
Duncan's Range, 0.10 [2]	3, 1<2			1, 3<2	1<2<3	1<2<3
Duncan's Range, 0.05 [2]				1<2	1<2<3	1<2<3
Machine picking, weighted average	6.83	6.50	6.22	9.08	5.29	.95
Stripping	6.75	6.34	6.09	9.60	25.25	3.25
Significance level [1]	n.s.	n.s.	n.s.	n.s.	.01	.01
Ginning: [3]						
Treatment No. 1	6.96	6.67	6.48	9.82	12.60	2.00
Treatment No. 2	6.85	6.21	5.90	9.64	12.52	1.80
Treatment No. 3	7.09	6.59	6.22	10.05	13.17	2.07
Significance level [1]	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.
Duncan's Range, 0.10 [2]		2<1	2<1			2<1, 3
Duncan's Range, 0.05 [2]			2<1			2<3

[1] n.s. means not significant, 0.05 means significant at the 5-percent level of probability, and 0.01 means significant at the 1-percent level of probability, based on analysis of variance.

[2] The means are arrayed in ascending order by treatment number, based on significance by Duncan's Multiple Range Tests at the probability level indicated. The symbol < means less than.

[3] No. 1=TD-7C-SM-TD-7C-Gin-1LC-2LC. No. 2=TD-SM-7C-TD-7C-Gin-1LC-2LC. No. 3=TD-7C-SM-TD-7C-Gin-1LC.

TABLE 13.—*Effect of harvesting methods and ginning treatments on classification, CCC price per pound, Shirley Analyzer waste, linters content, and Colorimeter determinations of Auburn 56 variety cotton from Auburn, Ala., 1965 ginning tests*

Operation	Classification		CCC price per pound	Shirley Analyzer total waste	Linters content	Colorimeter determinations	
	Grade [1]	Staple length				Reflectance (R_d)	Yellowness (+b)
	Index	*32d inch*	*Cents*	*Percent*	*Percent*	*Units*	*Units*
Harvesting:							
1st machine picking (No. 1)	93.9	34.1	29.35	3.14	9.8	76.0	8.5
2d machine picking (No. 2)	85.0	34.2	27.14	4.81	10.8	74.2	8.2
Stripping (No. 3)	76.0	33.9	25.05	5.17	10.0	69.0	7.5
Significance level [2]	.01	n.s.	.01	.05	.01	.01	.01
Duncan's Range, 0.10 [3]	3<2<1	3<2	3<2<1	1<2, 3	1, 3<2	3<2<1	3<2<1
Duncan's Range, 0.05 [3]	3<2<1		3<2<1	1<2, 3	1, 3<2	3<2<1	3<2<1
Machine picking, weighted average	93.1	34.1	29.16	3.29	9.8	75.9	8.5
Stripping	76.0	33.9	25.05	5.17	10.0	69.0	7.5
Significance level [2]	.01	.05	.01	.05	n.s.	.01	.01
Ginning: [4]							
Treatment No. 1	85.3	34.0	27.24	4.10	10.2	73.6	8.0
Treatment No. 2	85.9	34.0	27.43	3.93	10.0	73.5	8.1
Treatment No. 3	83.6	34.2	26.88	5.09	10.2	72.2	8.1
Significance level [2]	n.s.	n.s.	n.s.	.01	n.s.	.01	n.s.
Duncan's Range, 0.10 [3]	3<1, 2	2, 1<3	3<2	2, 1<3		3<2, 1	
Duncan's Range, 0.05 [3]	3<2	2, 1<3		2, 1<3		3<2, 1	

[1] See leaderwork, page 10, for names and values for various grade indices.

[2] n.s. means not significant, 0.05 means significant at the 5-percent level of probability, and 0.01 means significant at the 1-percent level of probability, based on analysis of variance.

[3] The means are arrayed in ascending order by treatment number, based on significance by Duncan's Multiple Range Tests at the probability level indicated. The symbol < means less than.

[4] No. 1=TD-7C-SM-TD-7C-Gin-1LC-2LC. No. 2=TD-SM-7C-TD-7C-Gin-1LC-2LC. No. 3=TD-7C-SM-TD-7C-Gin-1LC.

TABLE 14.—*Effect of harvesting methods and ginning treatments on ginning rate, trash removal per bale, bale weights, and bale values of Auburn 56 variety cotton from Auburn, Ala., 1965 ginning tests*

Operation	Ginning rate per saw per hour	Trash removed [1]		Weight [2]		Value [2]	
		By seed cotton machinery	By lint cleaners	Adjusted gross per bale	Per seed cotton unit	Adjusted gross per bale	Per seed cotton unit
	Pounds	*Percent*	*Percent*	*Pounds*	*Pounds*	*Dollars*	*Dollars*
Harvesting:							
1st machine picking (No. 1)	10. 62	82. 54	0. 54	493. 2	549. 3	144. 77	161. 27
2nd machine picking (No. 2)	9. 67	77. 68	. 77	499. 4	507. 1	135. 50	137. 65
Stripping (No. 3)	8. 23	87. 12	. 78	504. 5	551. 4	126. 39	138. 15
Significance level [3]	. 01	. 01	. 01	n.s.	. 05	. 01	. 01
Duncan's range, 0. 10 [4]	3<2<1	2<1<3	1<2, 3	1<3	2<1, 3	3<2<1	2, 3<1
Duncan's range, 0. 05 [4]	3<2<1	2<1<3	1<2, 3	1<3	2<1, 3	3<2<1	2, 3<1
Machine picking, weighted average	10. 54	82. 12	. 56	493. 7	545. 8	143. 97	159. 24
Stripping	8. 23	87. 12	. 78	504. 5	551. 4	126. 39	138. 15
Significance level [3]	. 01	. 05	. 01	n.s.	n.s.	. 01	. 01
Ginning: [5]							
Treatment No. 1	9. 91	81. 92	. 83	495. 7	541. 6	134. 93	147. 58
Treatment No. 2	8. 89	83. 16	. 75	496. 7	529. 6	136. 15	145. 17
Treatment No. 3	9. 71	82. 26	. 52	504. 7	536. 7	135. 57	144. 31
Significance level [3]	. 05	n.s.	. 01	. 01	n.s.	n.s.	n.s.
Duncan's Range, 0. 10 [4]	2<3, 1	----------	3<2<1	1, 2<3	----------	----------	----------
Duncan's Range, 0. 05 [4]	2<3, 1	----------	3<2<1	1, 2<3	----------	----------	----------

[1] Percentages of trash removed by seed cotton machinery based on fractionation data from wagon and feeder samples; percentages of trash removed by lint cleaners based on original seed cotton weight.

[2] Adjusted gross weights and bale values computed on basis of control bale at 7 percent lint moisture and 3.5 percent lint foreign matter. Bale weights and values per seed cotton unit computed on basis of 1,500 pounds of seed cotton for machine picking and 2,000 pounds for stripping.

[3] n.s. means not significant, 0.05 means significant at the 5-percent level of probability, and 0.01 means significant at the 1-percent level of probability, based on analysis of variance.

[4] The means are arrayed in ascending order by treatment number, based on significance by Duncan's Multiple Range Tests at the probability level indicated. The symbol < means less than.

[5] No. 1=TD-7C-SM-TD-7C-Gin-1LC-2LC. No. 2=TD-SM-7C-TD-7C-Gin-1LC-2LC. No. 3=TD-7C-SM-TD-7C-Gin-1LC.

The significant interactions between harvesting and ginning for composite grade index and unit lint value indicated that the grade or price of picked cotton varied slightly among ginning treatments, whereas neither grade nor price varied in the stripped cotton.

Auburn 1966 crop

The effects of harvesting methods and ginning treatments on moisture and foreign matter content (table 15 and appendix table 33); on classification (grade and staple length), CCC price per pound (unit lint value), total waste (lint foreign matter), linters content, and Colorimeter determinations (reflectance, R_d, and yellowness, +b) (table 16); and on ginning rate, trash removal, bale weight, and bale value (table 17), all were determined for cotton from Auburn, Ala., in 1966.

Lint moisture contents were close to the range desired, averaging 7.51 percent for the first picking, 4.71 percent for the second, and 6.01 percent for the stripping (table 15). These lint moistures were obtained from wagon moisture contents of 12.70 percent, 10.29 percent, and 16.53 percent (appendix table 33).

Seed moisture contents averaged 13.16 percent for the first picking, 10.09 percent for the second, and 15.82 percent for the stripping. Seed moisture contents for the first and second pickings indicated firm seed at time of ginning but rather moist seed for the stripping.

Of the 90 subsamples from 18 bales of Auburn 1966 picked cotton, none were reduced in grade because of grass or bark content. However, eight of the second-picked samples were classed as Light Spot. Of the stripped cotton, eight were reduced in grade from Low Middling to Strict Good Ordinary because of grass content, 17 had a trace of bark, but were not reduced, and two had a trace of grass, but were not reduced.

The composite grade index of the picked samples averaged 91.1, or just above Low Middling Plus (table 16). Before reductions, the composite grade

TABLE 15.—*Effect of harvesting methods and ginning treatments on moisture content of fiber and seed and on foreign matter content of Auburn 56 variety seed cotton from Auburn, Ala., 1966 ginning tests*

Operation	Fiber moisture content			Seed moisture content	Foreign matter content	
	Initial	Feeder apron	Lint slide		Wagon	Feeder apron
	Percent	*Percent*	*Percent*	*Percent*	*Percent*	*Percent*
Harvesting:						
1st machine picking (No. 1)	8. 94	8. 09	7. 51	13. 16	4. 39	1. 08
2d machine picking (No. 2)	6. 28	5. 29	4. 71	10. 09	18. 64	2. 63
Stripping (No. 3)	8. 95	7. 09	6. 01	15. 82	26. 15	4. 02
Significance level [1]	. 01	. 01	. 01	. 01	. 01	. 01
Duncan's Range, 0.10 [2]	2<1, 3	2<3<1	2<3<1	2<1<3	1<2<3	1<2<3
Duncan's Range, 0.05 [2]	2<1, 3	2<3, 1	2<3<1	2<1<3	1<2<3	1<2<3
Machine picking, weighted average	8. 70	7. 84	7. 26	12. 88	5. 67	1. 20
Stripping	8. 95	7. 09	6. 01	15. 82	26. 15	4. 02
Significance level [1]	n.s.	n.s.	n.s.	. 01	. 01	. 05
Ginning: [3]						
Treatment No. 1	8. 01	6. 90	6. 06	12. 81	16. 34	2. 73
Treatment No. 2	8. 02	6. 78	6. 03	13. 17	16. 46	2. 32
Treatment No. 3	8. 13	6. 79	6. 15	13. 10	16. 37	2. 68
Significance level [1]	n.s.	n.s.	n.s.	n.s.	n.s.	. 05
Duncan's Range, 0.10 [2]						2<3, 1
Duncan's Range, 0.05 [2]						2<3, 1

[1] n.s. means not significant, 0.05 means significant at the 5-percent level of probability, and 0.01 means significant at the 1-percent level of probability, based on analysis of variance.

[2] The means are arrayed in ascending order by treatment number, based on significance by Duncan's Multiple Range Tests at the probability level indicated. The symbol < means less than.

[3] No. 1=TD-7C-SM-TD-7C-Gin-1LC-2LC. No. 2=TD-SM-7C-TD-7C-Gin-1LC-2LC. No. 3=TD-7C-SM-TD-7C-Gin-1LC.

TABLE 16.—*Effect of harvesting methods and ginning treatments on classification, CCC price per pound, Shirley Analyzer waste, linters content, and Colorimeter determinations of Auburn 56 variety cotton from Auburn, Ala., 1966 ginning tests*

Operation	Classification		CCC price per pound	Shirley Analyzer total waste	Linters content	Colorimeter determinations	
	Grade [1]	Staple length				Reflectance (R_d)	Yellowness (+b)
	Index	*32d inch*	*Cents*	*Percent*	*Percent*	*Units*	*Units*
Harvesting:							
1st machine picking (No. 1)	92. 6	34. 0	19. 38	3. 74	10. 8	71. 6	8. 6
2d machine picking (No. 2)	76. 2	33. 9	16. 47	7. 58	11. 3	63. 4	7. 7
Stripping (No. 3)	79. 9	34. 0	16. 76	5. 94	10. 4	68. 3	7. 7
Significance level [2]	. 05	n.s.	. 01	. 05	. 05	. 01	. 01
Duncan's Range, 0.10 [3]	2, 3<1		2, 3<1	1<3<2	3<1<2	2<3<1	3, 2<1
Duncan's Range, 0.05 [3]	2, 3<1		2, 3<1	1<3<2	3<2	2<3<1	3, 2<1
Machine picking, weighted average	91. 1	34. 0	18. 61	4. 08	10. 8	70. 9	8. 5
Stripping	79. 9	34. 0	16. 76	5. 94	10. 4	68. 3	7. 7
Significance level [2]	n.s.	n.s.	n.s.	n.s.	. 01	. 01	. 01
Ginning: [4]							
Treatment No. 1	82. 6	34. 0	17. 55	5. 43	10. 9	68. 0	8. 0
Treatment No. 2	84. 5	34. 0	17. 78	5. 04	10. 7	68. 2	8. 1
Treatment No. 3	81. 6	33. 9	17. 28	6. 79	10. 9	67. 1	7. 9
Significance level [2]	. 05	n.s.	n.s.	. 01	n.s.	. 01	. 01
Duncan's Range, 0.10 [3]	3, 1<2			2, 1<3		3<1, 2	3, 1<2
Duncan's Range, 0.05 [3]	3<2			2, 1<3		3<1, 2	3, 1<2

[1] See leaderwork, page 10, for names and values for various grade indices.

[2] n.s. means not significant, 0.05 means significant at the 5-percent level of probability, and 0.01 means significant at the 1-percent level of probability, based on analysis of variance.

[3] The means are arrayed in ascending order by treatment number, based on significance by Duncan's Multiple Range Tests at the probability level indicated. The symbol < means less than.

[4] No. 1=TD-7C-SM-TD-7C-Gin-1LC-2LC. No. 2=TD-SM-7C-TD-7C-Gin-1LC-2LC. No. 3=TD-7C-SM-TD-7C-Gin-1LC.

index of the stripped cotton averaged 85.0, or Low Middling. After reductions, these indices averaged 79.9 for the stripped samples, or just below Strict Good Ordinary Plus.

Although significant, the ginning treatment differences, excepting foreign matter contents, were relatively small. Samples in treatment No. 1 had highest ginning rate and highest trash percentage removed by lint cleaners. Samples in treatment No. 2 had lowest Shirley Analyzer total lint waste, highest Colorimeter reflectance (R_d) and yellowness (+b), highest composite grade index, and lowest adjusted gross bale weight. Treatment No. 3 had highest Shirley Analyzer total lint waste, lowest Colorimeter reflectance and yellowness, lowest composite grade index, lowest trash percentage removal by lint cleaners, and highest adjusted gross bale weight. (table 17). All these results would be expected since only one lint cleaner was used in No. 3. The above measurements indicated more effective cleaning and resulting higher grade when the stick and green leaf machine was placed first in the system.

The significant interaction between harvesting and ginning for ginning rate indicated inconsistent values for this item. Ginning rate of picked cotton varied slightly among ginning treatments, but ginning rate of stripped cotton was constant among ginning treatments.

TABLE 17.—*Effect of harvesting methods and ginning treatments on ginning rate, trash removal per bale, bale weights, and bale values of Auburn 56 variety cotton from Auburn, Ala., 1966 ginning tests*

Operation	Ginning rate per saw per hour	Trash removed [1]		Weight [2]		Value [2]	
		By seed cotton machinery	By lint cleaners	Adjusted gross per bale	Per seed cotton unit	Adjusted gross per bale	Per seed cotton unit
	Pounds	*Percent*	*Percent*	*Pounds*	*Pounds*	*Dollars*	*Dollars*
Harvesting:							
1st machine picking (No 1)	9. 66	75. 20	0. 64	503. 9	500. 3	97. 70	96. 97
2d machine picking (No. 2)	7. 42	85. 54	1. 32	512. 2	444. 7	84. 30	73. 81
Stripping (No. 3)	8. 21	84. 59	1. 05	509. 7	462. 0	85. 37	77. 39
Significance level [3]	. 01	. 01	. 05	n.s.	. 01	. 01	. 01
Duncan's Range, 0.10 [4]	2<3<1	1<3, 2	1<3<2	----------	2, 3<1	2, 3<1	2, 3<1
Duncan's Range, 0.05 [4]	2, 3<1	1<3, 2	1<3<2	----------	2, 3<1	2, 3<1	2, 3<1
Machine picking, weighted average	9. 46	76. 13	. 70	504. 6	495. 3	93. 88	94. 89
Stripping	8. 21	84. 59	1. 05	509. 7	462. 0	85. 37	77. 39
Significance level [3]	. 05	. 05	n.s.	n.s.	n.s.	n.s.	. 01
Ginning: [5]							
Treatment No. 1	8. 70	80. 77	1. 21	506. 8	468. 6	88. 90	83. 07
Treatment No. 2	8. 00	83. 50	1. 09	504. 5	466. 1	89. 70	83. 13
Treatment No. 3	8. 59	81. 06	. 70	514. 5	472. 4	88. 80	81. 97
Significance level [3]	. 01	n.s.	. 01	. 01	n.s.	n.s.	n.s.
Duncan's Range, 0.10 [4]	2<3, 1	----------	3<2<1	2, 1<3	----------	----------	----------
Duncan's Range, 0.05 [4]	2<3, 1	----------	3<2<1	2, 1<3	----------	----------	----------

[1] Percentages of trash removed by seed cotton machinery based on fractionation data from wagon and feeder samples; percentages of trash removed by lint cleaners based on original seed cotton weight.

[2] Adjusted gross weights and bale values computed on basis of control bale at 7 percent lint moisture and 3.5 percent lint foreign matter. Bale weights and values per seed cotton unit computed on basis of 1,500 pounds of seed cotton for machine picking and 2,000 pounds for stripping.

[3] n.s. means not significant, 0.05 means significant at the 5-percent level of probability, and 0.01 means significant at the 1-percent level of probability, based on analysis of variance.

[4] The means are arrayed in ascending order by treatment number, based on significance by Duncan's Multiple Range Tests at the probability level indicated. The symbol < means less than.

[5] No. 1=TD-7C-SM-TD-7C-Gin-1LC-2LC. No. 2=TD-SM-7C-TD-7C-Gin-1LC-2LC. No. 3=TD-7C-SM-TD-7C-Gin-1LC.

Fiber Quality

In comparisons of methods of harvest at Clemson in 1964, machine picking was associated with higher ⅛-inch-gage fiber strength and higher micronaire readings (table 18). In comparisons of ginning treatments, upper quartile length and mean length were less in samples in treatments No. 1 and No. 2 than in No. 3; and short fiber content by the array method was less in samples in No. 1 than in No. 2 and No. 3.

In comparisons of methods of harvest at Clemson in 1965, machine picking was associated with higher Digital Fibrograph 2.5-percent span length, 50-percent span length, and uniformity ratio; with higher zero-gage fiber strength; and with higher micronaire reading (table 19).

In comparisons of methods of harvest at Auburn in 1965, machine picking was associated with higher Digital Fibrograph 2.5-percent span length and higher ⅛-inch-gage fiber strength (table 20). In comparisons of ginning treatments, micronaire readings for samples in No. 3 were less than in No. 2 at the 5-percent level.

In comparisons of methods of harvest at Auburn in 1966, machine picking was associated with higher 2.5-percent span length, uniformity ratio, and zero-gage strength (table 21). Stripped cotton had significantly higher elongation, although the means differed by only 0.1 unit.

There were no significant differences in fiber quality among ginning treatments.

TABLE 18.—*Effect of harvesting methods and ginning treatments on length, length distribution, strength, and fineness of ginned lint of Auburn 56 variety cotton from Clemson, S.C., 1964 ginning tests*

Operation	Suter-Webb array				Digital Fibrograph			Pressley strength		Micronaire
	Upper quartile length	Mean length	Coefficient of variability	Fibers shorter than ½ inch	2.5% span length	50% span length	Uniformity ratio	Zero gage	⅛-inch gage	
	Inch	*Inch*	*Percent*	*Percent*	*Inch*	*Inch*	*Percent*	*1,000 P.s.i.*	*Grams per tex*	*Reading*
Harvesting:										
1st machine picking (No. 1)	1. 157	0. 949	30. 9	9. 92	1. 071	0. 489	45. 6	68. 9	20. 19	4. 24
2nd machine picking (No. 2)	1. 187	. 953	32. 8	11. 37	1. 093	. 486	44. 6	70. 7	21. 64	3. 28
Stripping (No. 3)	1. 156	. 936	32. 0	10. 91	1. 065	. 478	44. 9	68. 2	20. 03	3. 77
Significance level [1]	. 05	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.	. 01	. 01
Duncan's Range, 0.10 [2]	3,1<2		1<2		3, 1<2			3<2	3, 1<2	2<3<1
Duncan's Range, 0.05 [2]	3,1<2				3, 1<2				3, 1<2	2<3<1
Machine picking, weighted average	1. 166		31. 5		1. 078			69. 5	20. 67	3. 93
Stripping	1. 156		32. 0		1. 065			68. 2	20. 03	3. 77
Significance level [1]	n.s.		n.s.		n.s.			n.s.	. 05	. 01
Ginning: [3]										
Treatment No. 1	1. 165	. 948	31. 6	10. 36	1. 075	. 487	45. 2	69. 4	20. 58	3. 78
Treatment No. 2	1. 159	. 939	32. 2	11. 09	1. 074	. 482	44. 9	69. 0	20. 72	3. 78
Treatment No. 3	1. 174	. 951	31. 9	10. 76	1. 080	. 485	44. 9	69. 3	20. 57	3. 73
Significance level [1]	. 05	. 05	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.
Duncan's Range, 0.10 [2]	2,1<3	2<1, 3		1<2						
Duncan's Range, 0.05 [2]	2<3	2<1, 3								

[1] n.s. means not significant, 0.05 means significant at the 5-percent level of probability, and 0.01 means significant at the 1-percent level of probability, based on analysis of variance.

[2] The means are arrayed in ascending order by treatment number, based on significance by Duncan's Multiple Range Tests at the probability level indicated. The symbol < means less than.

[3] No. 1=TD-7C-SM-TD-7C-Gin-1LC-2LC. No. 2=TD-SM-7C-TD-7C-Gin-1LC-2LC. No. 3=TD-7C-TD-7C-SM-Gin-1LC-2LC.

TABLE 19.—*Effect of harvesting methods and ginning treatments on length, length distribution, strength, and fineness of ginned lint of Auburn 56 variety cotton from Clemson, S.C., 1965 ginning tests*

Operation	Digital Fibrograph			Pressley strength		Micronaire
	2.5% span length	50% span length	Uniformity ratio	Zero gage	⅛-inch gage	
	Inches	*Inches*	*Percent*	*1,000 P.s.i.*	*Grams per tex*	*Reading*
Harvesting:						
1st machine picking (No. 1)	1.083	0.486	44.9	74.7	21.89	3.87
2d machine picking (No. 2)	.998	.431	43.3	73.9	20.61	3.67
Stripping (No. 3)	1.034	.437	42.1	73.0	20.88	3.63
Significance level [1]	.01	.01	.01	n.s.	.01	.05
Duncan's Range, 0.10 [2]	2<3<1	2<3<1	3<2<1	3<1	2, 3<1	3, 2<1
Duncan's Range, 0.05 [2]	2<3<1	2, 3<1	3<2<1	3<1	2, 3<1	3, 2<1
Machine picking, weighted average	1.067	.476	44.6	74.5	21.65	3.83
Stripping	1.034	.437	42.1	73.0	20.88	3.63
Significance level [1]	.05	.01	.05	.05	n.s.	.01
Ginning: [3]						
Treatment No. 1	1.041	.449	43.1	73.8	21.09	3.69
Treatment No. 2	1.039	.457	43.9	73.9	21.24	3.73
Treatment No. 3	1.036	.448	43.3	73.9	21.04	3.74
Significance level [1]	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.
Duncan's Range, 0.10 [2]						
Duncan's Range, 0.05 [2]						

[1] n.s. means not significant, 0.05 means significant at the 5-percent level of probability, and 0.01 means significant at the 1-percent level of probability, based on analysis of variance.

[2] The means are arrayed in ascending order by treatment number, based on significance by Duncan's Multiple Range Tests at the probability level indicated. The symbol < means less than.

[3] No. 1=TD-7C-SM-TD-7C-Gin-1LC-2LC. No. 2=TD-SM-7C-TD-7C-Gin-1LC-2LC. No. 3=TD-7C-SM-TD-7C-Gin-1LC-2LC.

TABLE 20.—*Effect of harvesting methods and ginning treatments on length, length distribution, strength, and fineness of ginned lint of Auburn 56 variety cotton from Auburn, Ala., 1965 ginning tests*

Operation	Digital Fibrograph			Pressley strength		Micronaire
	2.5% span length	50% span length	Uniformity ratio	Zero gage	⅛-inch gage	
	Inches	*Inches*	*Percent*	*1,000 P.s.i.*	*Grams per tex*	*Reading*
Harvesting:						
1st machine picking (No. 1)	1.042	0.480	46.0	77.9	21.50	4.67
2d machine picking (No. 2)	1.043	.452	43.3	78.8	22.14	3.56
Stripping (No. 3)	1.022	.459	44.9	74.9	20.64	4.42
Significance level [1]	.05	.05	.01	.05	.01	.01
Duncan's Range, 0.10 [2]	3<1, 2	2, 3<1	2<3<1	3<1, 2	3<1<2	2<3, 1
Duncan's Range, 0.05 [2]	3<1, 2	2, 3<1	2<3, 1	3<1, 2	3<1<2	2<3, 1
Machine picking, weighted average	1.042	.478	45.8	78.0	21.56	4.57
Stripping	1.022	.459	44.9	74.9	20.64	4.42
Significance level [1]	.05	n.s.	n.s.	n.s.	.05	n.s.
Ginning: [3]						
Treatment No. 1	1.039	.468	45.1	77.4	21.61	4.17
Treatment No. 2	1.032	.462	44.8	77.0	21.26	4.33
Treatment No. 3	1.037	.461	44.3	77.1	21.42	4.14
Significance level [1]	n.s.	n.s.	n.s.	n.s.	n.s.	.05
Duncan's Range, 0.10 [2]					2<1	3, 1<2
Duncan's Range, 0.05 [2]						3<2

[1] n.s. means not significant, 0.05 means significant at the 5-percent level of probability, and 0.01 means significant at the 1-percent level of probability, based on analysis of variance.

[2] The means are arrayed in ascending order by treatment number, based on significance by Duncan's Multiple Range Tests at the probability level indicated. The symbol < means less than.

[3] No. 1=TD-7C-SM-TD-7C-Gin-1LC-2LC. No. 2=TD-SM-7C-TD-7C-Gin-1LC-2LC. No. 3=TD-7C-SM-TD-7C-Gin-1LC.

TABLE 21.—*Effect of harvesting methods and ginning treatments on length, length distribution, strength, and fineness of ginned lint of Auburn 56 variety cotton from Auburn, Ala., 1966 ginning tests*

Operation	Digital Fibrograph		Stelometer determinations			Micronaire
	2.5% span length	Uniformity ratio	Zero gage strength	⅛-inch gage strength	Elongation	
	Inches	*Percent*	*1,000 P.s.i.*	*Grams per tex*	*Percent*	*Reading*
Harvesting:						
1st machine picking (No. 1)	1.081	47.4	80.5	21.91	6.65	5.04
2d machine picking (No. 2)	1.016	42.2	78.3	19.58	6.00	4.06
Stripping (No. 3)	1.044	45.6	78.0	20.38	6.69	4.82
Significance level [1]	.01	.01	.05	.01	.01	.01
Duncan's Range, 0.10 [2]	2<3<1	2<3<1	3, 2<1	2, 3<1	2<1, 3	2<3, 1
Duncan's Range, 0.05 [2]	2<3<1	2<3<1	2, 3<1	2, 3<1	2<1, 3	2<3, 1
Machine picking, weighted average	1.076	47.0	80.3	21.70	6.59	4.95
Stripping	1.044	45.6	78.0	20.38	6.69	4.82
Significance level [1]	.05	.05	.01	n.s.	.05	n.s.
Ginning: [3]						
Treatment No. 1	1.049	45.0	78.8	20.82	6.44	4.64
Treatment No. 2	1.046	45.1	78.7	20.45	6.59	4.65
Treatment No. 3	1.046	45.2	79.3	20.60	6.32	4.62
Significance level [1]	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.
Duncan's Range, 0.10 [2]						
Duncan's Range, 0.05 [2]						

[1] n.s. means not significant, 0.05 means significant at the 5-percent level of probability, and 0.01 means significant at the 1-percent level of probability, based on analysis of variance.

[2] The means are arrayed in ascending order by treatment number, based on significance by Duncan's Multiple Range Tests at the probability level indicated. The symbol < means less than.

[3] No. 1=TD-7C-SM-TD-7C-Gin-1LC-2LC. No. 2=TD-SM-7C-TD-7C-Gin-1LC-2LC. No. 3=TD-7C-SM-TD-7C-Gin-1LC.

The interaction between harvesting and ginning for 2.5-percent span length was statistically significant, but the differences were too small to be of any practical significance.

Processing Performance and Yarn Quality

Clemson 1964

Effects of harvesting methods and ginning treatments on processing performance and yarn quality of cotton were determined at Clemson in 1964 (table 22).

In comparison of harvesting methods and ginning treatments on processing performance, machine picking was associated with lower picker and card waste; fewer neps per 100 square inches of card web; higher break factor; and much lower ends down per 1,000 spindle hours. Nep content for samples in ginning treatments No. 1 and No. 2 were lower than in No. 3.

In summary, the Clemson 1964 stripper-harvested cotton had 35 percent higher picker and card waste than the machine-picked cotton (6.13 percent versus 4.54 percent); 22 percent more neps (21.3 versus 17.4); lower break factor (1,736 versus 1,802); and 3.4 times as many ends down (68 versus 20).

Clemson and Auburn 1965

Effects of harvesting methods and ginning treatments on processing performance and yarn quality of cotton were determined at Clemson and Auburn in 1965 (tables 23 and 24).

CLEMSON 1965.—In comparisons of harvesting methods and ginning treatments on processing performance, machine picking was associated with lower picker and card waste and higher yarn appearance. Picker and card waste for samples in ginning treatment No. 2 were lower than in No. 1, and were lower in No. 1 than in No. 3. Break factor for samples in No. 2 was lower than in No. 1 and No. 3.

In summary, the Clemson 1965 stripped cotton had 28 percent higher picker and card waste than the picked cotton (6.51 percent versus 5.10 percent) and 10 percent lower yarn appearance index (80.3 versus 89.4).

TABLE 22.—*Effect of harvesting methods and ginning treatments on processing performance and yarn quality of Auburn 56 variety cotton from Clemson, S.C., 1964 ginning tests*

Operation	Total picker and card waste	Neps per 100 square inches of card web	Break factor	Yarn appearance	Yarn irregularity coefficient of variability	Corrected ends down (EDMSH)[1]
	Percent	*Number*	*Units*	*Index*	*Percent*	*Number*
Harvesting:						
1st machine picking (No. 1)	4. 47	13. 1	1, 749	90. 7	21. 40	23
2d machine picking (No. 2)	4. 68	26. 6	1, 917	79. 7	21. 54	14
Stripping (No. 3)	6. 13	21. 3	1, 736	82. 3	21. 68	68
Significance level [2]	. 01	. 01	. 05	. 05	n.s.	. 01
Duncan's Range, 0.10 [3]	1, 2<3	1<3<2	3, 1<2	2, 3<1		2, 1<3
Duncan's Range, 0.05 [3]	1, 2<3	1<3<2	3, 1<2	2, 3<1		2, 1<3
Machine picking, weighted average	4. 54	17. 4	1, 802	87. 2		20
Stripping	6. 13	21. 3	1, 736	82. 3		68
Significance level [2]	. 05	. 05	. 05	n.s.		. 05
Ginning: [4]						
Treatment No. 1	5. 08	19. 1	1, 812	85. 8	21. 60	32
Treatment No. 2	5. 06	19. 3	1, 801	83. 2	21. 44	38
Treatment No. 3	5. 14	22. 6	1, 789	83. 7	21. 58	36
Significance level [2]	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.
Duncan's Range, 0.10 [3]		1, 2<3				
Duncan's Range, 0.05 [3]						

[1] Ends down per 1,000 spindle hours.

[2] n.s. means not significant, 0.05 means significant at the 5-percent level of probability, and 0.01 means significant at the 1-percent level of probability, based on analysis of variance.

[3] The means are arrayed in ascending order by treatment number, based on significance by Duncan's Multiple Range Tests at the probability level indicated. The symbol < means less than.

[4] No. 1=TD–7C–SM–TD–7C–Gin–1LC–2LC. No. 2=TD–SM–7C–TD–7C–Gin–1LC–2LC. No. 3=TD–7C–TD–7C–SM–Gin–1LC–2LC.

TABLE 23.—*Effect of harvesting methods and ginning treatments on processing performance and yarn quality of Auburn 56 variety cotton from Clemson, S.C., 1965 ginning tests*

Operation	Total picker and card waste	Neps per 100 square inches of card web	Break factor	Yarn appearance	Yarn irregularity coefficient of variability	Corrected ends down (EDMSH)[1]
	Percent	*Number*	*Units*	*Index*	*Percent*	*Number*
Harvesting:						
1st machine picking (No. 1)	5. 02	8. 1	1, 888	90. 6	21. 10	15
2d machine picking (No. 2)	5. 43	10. 3	1, 647	84. 0	23. 44	104
Stripping (No. 3)	6. 51	10. 6	1, 659	80. 3	22. 87	53
Significance level [2]	. 01	. 05	. 05	. 05	. 01	. 05
Duncan's Range, 0.10 [3]	1, 2<3	1<2, 3	2, 3<1	3, 2<1	1<3, 2	1, 3<2
Duncan's Range, 0.05 [3]	1, 2<3	1<2, 3	2, 3<1	3<1	1<3, 2	1<2
Machine picking, weighted average	5. 10	8. 5	1, 843	89. 4	21. 54	32
Stripping	6. 51	10. 6	1, 659	80. 3	22. 87	53
Significance level [2]	. 05	n.s.	n.s.	. 05	n.s.	n.s.
Ginning: [4]						
Treatment No. 1	5. 57	10. 3	1, 748	85. 6	22. 44	50
Treatment No. 2	5. 26	9. 3	1, 706	82. 6	22. 62	63
Treatment No. 3	6. 14	9. 3	1, 741	86. 8	22. 34	60
Significance level [2]	. 01	n.s.	. 05	n.s.	n.s.	n.s.
Duncan's Range, 0.10 [3]	2<1<3	2, 3<1	2<3, 1	2<3	3<2	
Duncan's Range, 0.05 [3]	2<1<3	2, 3<1	2<3, 1	2<3		

[1] Ends down per 1,000 spindle hours.

[2] n.s. means not significant, 0.05 means significant at the 5-percent level of probability, and 0.01 means significant at the 1-percent level of probability, based on analysis of variance.

[3] The means are arrayed in ascending order by treatment number, based on significance by Duncan's Multiple Range Tests at the probability level indicated. The symbol < means less than.

[4] No. 1=TD–7C–SM–TD–7C–Gin–1LC–2LC. No. 2=TD–SM–7C–TD–7C–Gin–1LC–2LC. No. 3=TD–7C–SM–TD–7C–Gin–1LC.

AUBURN 1965.—In comparisons of harvesting methods and ginning treatments on processing performance, machine picking was associated with lower picker and card waste, higher break factor, fewer ends down per 1,000 spindle hours, fewer neps, and lower yarn irregularity coefficient of variability.

Ginning treatments No. 1 and No. 2 were lower than No. 3 for picker and card waste. Samples in No. 1 and No. 3 had fewer neps per 100 square inches of card web than No. 2; samples in No. 2 were lower than No. 3 for break factor; samples in No. 3 were lower than No. 2 for ends down per 1,000 spindle hours; and samples in No. 1 and No. 3 were lower than No. 2 for yarn irregularity coefficient of variability. The cotton from ginning treatment No. 2 did not perform as well in spinning as that from No. 1 and No. 3.

TABLE 24.—*Effect of harvesting methods and ginning treatments on processing performance and yarn quality of Auburn 56 variety cotton, Auburn, Ala., 1965 ginning tests*

Operation	Total picker and card waste	Neps per 100 square inches of card web	Break factor	Yarn appearance	Yarn irregularity coefficient of variability	Corrected ends down (EDMSH)[1]
	Percent	*Number*	*Units*	*Index*	*Percent*	*Number*
Harvesting:						
1st machine picking (No. 1)	4. 55	5. 6	1, 803	100. 7	21. 13	30
2d machine picking (No. 2)	6. 10	9. 6	1, 883	93. 8	21. 63	28
Stripping (No. 3)	6. 17	6. 9	1, 645	96. 3	22. 07	87
Significance level [2]	. 01	. 01	. 05	. 05	. 05	. 05
Duncan's Range, 0.10 [3]	1<2, 3	1<3<2	3<1, 2	2, 3<1	1<3	2, 1<3
Duncan's Range. 0.05 [3]	1<2, 3	1, 3<2	3<1, 2	2, 3<1	1<3	2, 1<3
Machine picking, weighted average	4. 68	5. 9	1, 810	100. 1	21. 17	30
Stripping	6. 17	6. 9	1, 645	96. 3	22. 07	87
Significance level [2]	. 05	n.s.	. 05	n.s.	. 05	. 05
Ginning: [4]						
Treatment No. 1	5. 44	7. 2	1, 788	96. 2	21. 56	48
Treatment No. 2	5. 26	7. 8	1, 748	96. 3	21. 87	56
Treatment No. 3	6. 12	7. 0	1, 794	98. 2	21. 41	41
Significance level [2]	. 01	. 05	. 10	n.s.	. 01	. 05
Duncan's Range, 0.10 [3]	2, 1<3	3, 1<2	2<1, 3	----------	3, 1<2	3<2
Duncan's Range, 0.05 [3]	2, 1<3	3, 1<2	2<3	----------	3, 1<2	3<2

[1] Ends down per 1,000 spindle hours.

[2] n.s. means not significant, 0.10 means significant at the 10-percent level of probability, and 0.05 means significant at the 1-percent level of probability, and 0.01 means significant at the 1-percent level of probability, based on analysis of variance.

[3] The means are arrayed in ascending order by treatment number, based on significance by Duncan's Multiple Range Tests at the probability level indicated. The symbol < means less than.

[4] No. 1=TD-7C-SM-TD-7C-Gin-1LC-2LC. No. 2=TD-SM-7C-TD-7C-Gin-1LC-2LC. No. 3=TD-7C-SM-TD-7C-Gin-1LC.

RECOMMENDATIONS FOR FUTURE WORK

As this study progressed, several developments occurred that will eventually affect the feasibility of stripper harvesting in the Southeast.

Research was begun at Clemson University and other locations to develop stripper-type cotton varieties suitable for the area.

Brush-type strippers have been developed further, and several companies are marketing them. Field cleaning has been investigated further, and several companies are offering brush strippers with cleaning equipment based on the limb and stalk remover or stick and green leaf machine principles developed by the U.S. Cotton Ginning Research Laboratory at Stoneville, Miss.

Another development was the widespread use of card crusher rolls in mill processing. These devices effectively remove certain types of trash and thus improve the spinning operation, particularly on cotton with high foreign matter contents of certain types. More extraction can conceivably alter the type of trash in stripper-harvested cotton.

Based on the above events, consideration should be given to conducting studies of this nature again in the Southeast, especially if the brush-type strippers now on the market are further improved, and if effective, lightweight cleaners placed on them gain wide acceptance.

APPENDIX

TABLE 25.—*Drier inlet temperature and ambient relative humidity during ginning of Auburn 56 variety cotton from Clemson, S.C., 1964 ginning tests*

Ginning treatment number and replication [1]	First machine picking—relative humidity [2]	Second machine picking		Stripping—relative humidity [2]
		Drier inlet temperature [3]	Relative humidity	
	Percent	*°F*	*Percent*	*Percent*
1A	34	76	39	47
1B	63	61	64	52
1C	53	80	22	49
Average	50	72	42	49
2A	34	63	51	30
2B	71	82	31	57
2C	61	70	43	52
Average	55	72	42	46
3A	39	76	39	34
3B	38	71	50	46
3C	53	79	22	68
Average	43	75	37	49

[1] 1, 2, and 3 are ginning treatment numbers; A, B, and C are replications.

[2] Drier inlet temperatures were 150° F. for the first drier and 100° F. for the second drier for both the first machine picking and the stripping.

[3] No artificial heat used. Both driers at same temperature.

TABLE 26.—*Drier inlet temperature and ambient relative humidity during ginning of Auburn 56 variety cotton from Clemson, S.C., and from Auburn, Ala., 1965 ginning tests*

Ginning treatment number and replication [1]	First machine picking					Second machine picking				Stripping			
	Drier inlet temperature [2]			Relative humidity		Drier inlet temperature [2]		Relative humidity		Drier inlet temperature [2]		Relative humidity	
	Auburn—both driers	Clemson		Auburn	Clemson	Auburn—both driers	Clemson—both driers	Auburn	Clemson	Auburn—both driers	Clemson—both driers	Auburn	Clemson
		1st drier	2d drier										
	°F	°F	°F	Percent	Percent	°F	°F	Percent	Percent	°F	°F	Percent	Percent
1A	80	150	70	78	68	76	72	51	32	65	58	72	36
1B	79	175	70	84	91	68	52	68	58	70	73	56	30
1C	91	60	60	51	52	74	56	57	56	69	60	54	50
Average	83	128	67	71	70	73	60	59	49	68	64	61	39
2A	88	150	69	56	70	76	66	50	38	69	56	66	39
2B	91	175	80	50	52	74	74	54	28	68	74	58	28
2C	88	76	76	56	32	75	63	52	39	66	66	55	35
Average	89	134	75	54	51	75	68	52	35	68	65	60	34
3A	88	150	73	52	62	76	59	50	56	68	72	67	33
3B	79	175	77	83	56	72	74	58	28	70	68	55	32
3C	90	76	76	53	39	72	58	62	52	68	56	54	58
Average	86	134	75	63	52	73	64	57	45	69	65	59	41

[1] 1, 2, and 3 are ginning treatment numbers; A, B, and C are replications.

[2] No artifical heat used in drying except for parts of Clemson first machine picking.

TABLE 27.—*Drier inlet temperature and ambient relative humidity during ginning of Auburn 56 variety cotton from Auburn, Ala., 1966 ginning tests*

Ginning treatment number and replication [1]	First machine picking		Second machine picking		Stripping	
	Drier inlet temperature—both driers [2]	Relative humidity	Drier inlet temperature—both driers [2]	Relative humidity	Drier inlet temperature—both driers [2]	Relative humidity
	°F	Percent	°F	Percent	°F	Percent
1A	70	72	50	42	67	60
1B	84	52	50	41	76	42
1C	69	86	54	39	76	42
Average	74	70	51	41	73	48
2A	81	55	50	41	64	60
2B	79	72	53	40	73	44
2C	68	94	54	40	73	48
Average	76	74	52	40	70	51
3A	75	63	51	40	70	51
3B	80	70	50	41	76	42
3C	71	81	54	40	70	54
Average	75	71	52	40	72	49

[1] 1, 2, and 3 are ginning treatment numbers; A, B, and C are replications.
[2] No artificial heat used.

TABLE 28.—*Gross weight, grade, and staple length of bales of Auburn 56 variety cotton from Clemson, S.C., 1964 ginning tests*

Code No.[1]	Bale No.	Gross weight	Grade	Staple length
Cotton No. 501, Clemson 1st machine picking:		Pounds	Designation	32d inch
501A–1	591	369	SLM Lt. Sp.	34
501B–1	594	414	SLM Lt. Sp.	34
501C–1	595	390	SLM	34
501A–2	589	372	SLM	34
501B–2	593	399	SLM Lt. Sp.	34
501C–2	597	412	SLM	34
501A–3	590	423	SLM	34
501B–3	592	388	SLM	34
501C–3	596	372	SLM Lt. Sp.	34
Cotton No. 502, Clemson 2d machine picking:				
502A–1	610	382	LM	34
502B–1	613	397	LM	34
502C–1	618	445	LM+	33
502A–2	611	392	LM	34
502B–2	615	394	LM	33
502C–2	616	386	LM	34
502A–3	612	384	SLM Lt. Sp.	34
502B–3	614	387	LM	34
502C–3	617	375	LM+	34
Cotton No. 503, Clemson stripping:				
503A–1	622	387	SGO/LM/Gr.	34
503B–1	626	437	LM	34
503C–1	630	446	LM	34
503A–2	623	485	LM	34
503B–2	625	426	LM	34
503C–2	629	419	SGO/LM/Gr.	34
503A–3	624	423	LM	34
503B–3	627	436	LM	34
503C–3	628	439	SGO/LM/Gr.	34

[1] 1, 2, and 3 are ginning treatment numbers; A, B, and C are replications.

TABLE 29.—*Gross weight, grade, and staple length of bales of Auburn 56 variety cotton from Clemson, S.C., 1965 ginning tests*

Code No.[1]	Bale No.	Gross weight	Grade	Staple length
		Pounds	*Designation*	*32d inch*
Cotton No. 601, Clemson 1st machine picking:				
601A–1	716	377	LM	35
601B–1	720	412	LM	34
601C–1	722	394	LM+	34
601A–2	715	375	LM	35
601B–2	719	393	LM	34
601C–2	723	340	SLM	34
601A–3	717	382	LM	34
601B–3	718	391	LM	34
601C–3	721	434	LM+	34
Cotton No. 602, Clemson 2d machine picking:				
602A–1	773	229	LM/SLM/Bk.	34
602B–1	776	237	LM	33
602C–1	777	235	SLM Lt. Sp.	33
602A–2	772	234	LM	33
602B–2	775	233	SLM Lt. Sp.	33
602C–2	779	248	SLM Lt. Sp.	33
602A–3	771	236	LM	34
602B–3	774	243	LM	33
602C–3	778	237	LM	33
Cotton No. 603, Clemson stripping:				
603A–1	782	356	LM	33
603B–1	784	328	SGO+	33
603C–1	787	341	SGO+	33
603A–2	781	355	LM+	34
603B–2	785	329	LM Lt. Sp.	33
603C–2	788	327	LM	33
603A–3	780	354	SGO+	33
603B–3	783	325	SGO+	33
603C–3	786	351	SGO/LM/Bk.	34

[1] 1, 2, and 3 are ginning treatment numbers; A, B, and C are replications.

TABLE 30.—*Gross weight, grade, and staple length of bales of Auburn 56 variety cotton from Auburn, Ala., 1965 ginning tests*

Code No.[1]	Bale No.	Gross weight	Grade	Staple length
		Pounds	*Designation*	*32d inch*
Cotton No. 605, Auburn 1st machine picking:				
605A–1	701	407	LM	34
605B–1	699	441	SLM	34
605C–1	697	425	SLM	34
605A–2	702	405	LM	34
605B–2	698	419	SLM	34
605C–2	695	418	LM	34
605A–3	703	402	LM	34
605B–3	700	423	LM	34
605C–3	696	426	LM	34
Cotton No. 606, Auburn 2d machine picking:				
606A–1	709	383	LM	34
606B–1	706	361	LM	35
606C–1	713	358	LM	35
606A–2	711	335	LM/SLM/Gr.	35
606B–2	708	357	LM/SLM/Gr.	35
606C–2	712	363	LM	34
606A–3	710	378	LM	34
606B–3	707	358	LM/SLM/Gr.	34
606C–3	714	369	LM	34

TABLE 30.—*Gross weight, grade, and staple length of bales of Auburn 56 variety cotton from Auburn, Ala., 1965 ginning tests*—Continued

Code No. [1]	Bale No.	Gross weight	Grade	Staple length
Cotton No. 607, Auburn stripping:		*Pounds*	*Designation*	*32d inch*
607A–1	760	370	LM	34
607B–1	758	389	LM/SLM/Bk.	34
607C–1	756	405	LM/SLM/Bk.	34
607A–2	762	365	LM	34
607B–2	759	393	LM	34
607C–2	754	454	LM/SLM/Bk.	34
607A–3	761	371	LM	34
607B–3	757	405	LM/SLM/Bk.	34
607C–3	755	435	LM/SLM/Bk.	34

[1] 1, 2, and 3 are ginning treatment numbers; A, B, and C are replications.

TABLE 31.—*Gross weight, micronaire reading, grade, and staple length of bales of Auburn 56 variety cotton from Auburn, Ala., 1966 ginning tests*

Code No.[1]	Bale No.	Gross weight	Micronaire	Grade	Staple length
Cotton No. 705, Auburn 1st machine picking:		*Pounds*	*Reading*	*Designation*	*32d inch*
705A–1	840	401	4.8	LM	34
705B–1	843	404	5.1	LM+	34
705C–1	847	420	5.5	LM	34
705A–2	842	398	5.0	LM	34
705B–2	844	401	5.0	LM+	34
705C–2	846	410	5.5	LM	34
705A–3	841	402	5.0	LM	34
705B–3	845	406	5.2	LM	34
705C–3	848	413	5.4	LM	34
Cotton No. 706, Auburn 2d machine picking: [2]					
706A–1	889	393	3.7	SGO	34
706B–1	890	390	4.4	GO	33
706A–2	891	390	3.9	SGO	33
706B–2	892	375	4.6	SGO	33
706A–3	887	395	3.9	SGO	34
706B–3	888	375	4.4	GO	33
Cotton No. 707, Auburn stripping:					
707A–1	865	309	4.6	SGO/LM/Bk.	33
707B–1	868	298	5.2	SGO/LM/Gr.	34
707C–1	870	301	5.1	SGO/LM/Gr.	34
707A–2	864	417	4.3	SGO/LM/Gr.	34
707B–2	867	298	4.8	SGO/LM/Gr.	33
707C–2	871	308	5.2	SGO+	34
707A–3	866	318	4.7	GO/SGO/Gr.	34
707B–3	869	317	4.9	SGO/LM/Gr.	34
707C–3	872	305	5.0	SGO/LM/Gr.	33

[1] 1, 2, and 3 are ginning treatment numbers; A, B, and C are replications.
[2] Replication C included in bale numbers for replications A and B.

TABLE 32.—*Smith-Doxey classification of Auburn 56 variety cotton harvested by machine picking and stripping, Clemson, S.C., 1964 and 1965, and Auburn, Ala., 1965 and 1966*

Year, location, and harvesting method	Classification		
	Composite grade [1]		Staple length
	Before reduction by classer	After reduction by classer	
	Index	*Index*	*32d inch*
1964 Clemson:			
1st machine picking	91. 8	91. 8	34. 0
2d machine picking	86. 6	86. 6	33. 8
Stripping	85. 0	82. 0	34. 0
1965 Clemson:			
1st machine picking	87. 1	87. 1	34. 2
2d machine picking	87. 3	86. 3	33. 2
Stripping	83. 2	82. 2	33. 2
1965 Auburn:			
1st machine picking	88. 0	88. 0	34. 0
2d machine picking	88. 0	85. 0	34. 4
Stripping	90. 0	85. 0	34. 0
1966 Auburn:			
1st machine picking	86. 1	86. 1	34. 0
2d machine picking	74. 0	74. 0	33. 3
Stripping	83. 6	75. 9	33. 7

[1] See leaderwork, page 10, for names and values of various grade indices.

TABLE 33.—*Effect of harvesting methods and ginning treatments on moisture content of Auburn 56 variety seed cotton from Clemson, S.C., 1964 and 1965, and from Auburn, Ala., 1965 and 1966*

Operation	Clemson 1964		Clemson 1965		Auburn 1965		Auburn 1966	
	Wagon moisture	Feeder moisture	Wagon moisture	Feeder moisture	Wagon moisture	Feeder moisture	Wagon moisture	Feeder moisture
Harvesting:	*Percent*	*Percent*	*Percent*	*Percent*	*Percent*	*Percent*	*Percent*	*Percent*
1st machine picking (No. 1)	14. 39	10. 14	12. 85	11. 27	8. 62	8. 24	12. 70	11. 73
2d machine picking (No. 2)	9. 77	8. 72	9. 09	8. 62	10. 36	9. 70	10. 29	8. 88
Stripping (No. 3)	11. 52	9. 21	10. 56	9. 10	9. 42	8. 75	16. 53	13. 42
Significance level [1]	. 05	n.s.	n.s.	n.s.	n.s.	n.s.	. 01	. 01
Duncan's Range, 0.10 [2]	2, 3<1	2<1	2<1	2, 3<1	1<2	1, 3<2	2<1<3	2<1<3
Duncan's Range, 0.05 [2]	2, 3<1	2<1	2<1	2<1	1<2	1<2	2<1<3	2<1<3
Machine picking, weighted average	12. 83	9. 69	12. 14	10. 78	8. 77	8. 36	12. 48	11. 48
Stripping	11. 52	9. 21	10. 56	9. 10	9. 42	8. 75	16. 53	13. 42
Significance level [1]	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.	. 05	. 05
Ginning:[3]								
Treatment No. 1	11. 68	9. 30	10. 85	9. 87	9. 45	8. 98	13. 17	11. 47
Treatment No. 2	11. 90	9. 37	11. 15	9. 28	9. 27	8. 67	13. 18	10. 99
Treatment No. 3	12. 09	9. 39	10. 49	9. 83	9. 68	9. 03	13. 17	11. 57
Significance level [1]	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.
Duncan's Range, 0.10 [2]								
Duncan's Range, 0.05 [2]								

[1] n.s. means not significant, 0.05 means significant at the 5-percent level of probability, and 0.01 means significant at the 1-percent level of probability, based on analysis of variance.

[2] The means are arrayed in ascending order by treatment number, based on significance by Duncan's Multiple Range Tests at the probability level indicated. The symbol < means less than.

[3] No. 1=TD-7C-SM-TD-7C-Gin-1LC-2LC. No. 2=TD-SM-7C-TD-7C-Gin-1LC-2LC. No. 3=TD-7C-TD-7C-SM-Gin-1LC-2LC in 1964, and TD-7C-SM-TD-7C-Gin-1LC in 1965 and 1966.

This publication reports research involving pesticides. It does not contain recommendations for their use, nor does it imply that the uses discussed here have been registered. All uses of pesticides must be registered by appropriate State and Federal agencies before they can be recommended.

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