LINT CLEANING STRIPPER-HARVESTED COTTON FOR MAXIMIZING PRODUCER NET RETURNS

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This report has been submitted to *Applied Engineering in Agriculture* journal for publication consideration.

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The authors would like to acknowledge the contributions of Don Ethridge, T.R. Owens, and Emmett Elam to the work reported in this study. This research was partially supported by the Agricultural Research Service, U.S. Department of Agriculture.

Texas Tech University, College of Agricultural Sciences Publication Number T-1-439 (CER-96-3).

September, 1996

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Abstract

This analysis simulated net returns for six stripper harvested cotton cultivars to determine the number of lint cleanings that maximizes producer net returns. The study found that net returns were consistently higher for one lint cleaning in the gin plant for all cultivars regardless of time of harvest. One lint cleaning gave higher net revenue by an average of $4.54/bale, with a range of $7.35 to $1.92/bale, in comparison to two lint cleanings.

Introduction

Seventy-one percent of the cotton produced in Texas is stripper harvested, with the remaining twenty-nine percent being machine picked (Glade et al. 1995). Stripper harvesting is faster than picker harvesting, but it includes more extraneous matter (non-lint and non-seed) with the cotton lint and seed. It is thus a common practice to clean stripper harvested cotton to a substantial extent during the ginning process. Cotton is transported to gin plants following harvest where the lint is removed from the seed, cleaned, pressed and baled. The objective is to provide cotton to the textile mill with an acceptable trash content and other fiber qualities. Baker (1994) recommends a combination of cotton ginning machinery for stripper harvested cotton and a gin process which includes two lint cleanings. This recommended processing procedure is assumed to produce satisfactory lint grades and near-maximum bale value for most cotton. Baker (1994) further suggests that modification of the recommendation (more cleaning) may be necessary in situations or areas that possess excessive amounts of foreign matter.

A persisting question with cotton cleaning is that of determining the optimum number of lint cleanings in the gin plant which would maximize producer profit. Several studies have

addressed the issue of the optimal level of lint cleaning with an objective of maximizing net returns. Baker et al. (1977) suggested two stages of lint cleaning to be near optimum for bale value and fiber quality. Ethridge et al. (1995) further addressed the consequences of successive stages of lint cleaning by considering the criteria of maximizing net revenue. These authors also found that two lint cleanings were the best general rule if the effects on prices, lint loss, and cost of lint cleaning are to be taken into consideration. Ethridge et al. (1995) considered only the energy costs of lint cleanings in their cost estimates and estimated price per pound of lint based on a pre-HVI market price structure that existed in 1992.

This study revisits the economic consequences of successive stages of lint cleaning using the economic criteria of maximizing net revenues per bale of ginned cotton. This criteria used differs from the Ethridge et al. (1995) study in that it considers the total cost of ginning activities associated with different levels of lint cleaning, the cost of lint loss in the gin plant, and the estimated price received based on HVI measurements of fiber attributes[1] and recent pricing structures.

Methods and Procedures

The determination of the optimal number of lint cleanings in the gin plant included several major components. A simulation model, GINQUAL (Barker et al., 1991), was used to determine the effects of lint cleanings on cotton quality attributes and lint losses. Market prices and price premiums and discounts were obtained from the Daily Price Estimation System, DPES (Brown et al. 1995; Hudson and Ethridge, 1995). Output from GINQUAL was incorporated into the DPES

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[1]Though classer's designations of color and trash, at times, differ from that of HVI measurements, it is assumed in this study that they do not differ significantly.

to generate the estimated cost of lint losses and revenues at sequential stages of lint cleanings. A ginning cost simulator, GINMODEL (Childers, 1995), was used to determine the total ginning cost of successive stages of lint cleaning. These estimates were used to calculate net revenues and the optimum number of lint cleanings for six stripper harvested cotton cultivars, each with early, midseason, and late harvest periods. The six cultivars chosen were Paymaster HS-26, Paymaster 145, All-Tex Atlas, All-Tex Quickie, Deltapine 90, and GSC 25.

Cotton Quality and Lint Loss

The GINQUAL simulator was used to determine changes in grade, staple length, strength, length uniformity, and micronaire of the cotton as it underwent 0, 1, 2, and 3 stages of lint cleanings. A lint turnout percentage, representing a ratio of the saleable lint weight to the weight of seed cotton entering the system, was also determined from the GINQUAL model.

The GINQUAL model simulated the processing of stripper harvested cotton at a rate of 15 bales per hour through a single 2.4 m (96 in.) wide overhead cleaning stream consisting of: (1) an airline cleaner, (2) first tower dryer, (3) first incline cleaner, (4) first stick machine, (5) second tower dryer, (6) second incline cleaner, (7) second stick machine, and (8) extractor feeder. The lint cleaning simulation used zero to three 2.2 m (88 in. wide) sequential lint cleaners. The simulated lint cleaners used a combing ratio of 30:1 with 0.4 m (16 in.) diameter saws operating at 1000 rpm. The first and second tower dryers' drying temperatures were held constant at 149 and 66 degrees Centigrade (300 and 150 degrees Fahrenheit), respectively, and the atmospheric temperature and relative humidity at 16 Centigrade (60 degrees Fahrenheit) and 30 percent humidity, respectively. Initial values for micronaire, length, strength, and uniformity ratio provided by tables included in the GINQUAL model were used in the simulation.

The lint loss in the gin plant due to precleaning and successive levels of lint cleaning were estimated from the GINQUAL output for the different cultivars, for different harvest dates, and for different levels of lint cleaning. Lint loss for each level of lint cleaning was calculated by subtracting the current level of turnout in percent from lint turnout for one less lint cleaner. The resulting lint turnout difference was multiplied by 1,045 kilograms (2,300 lbs.) of initial seed cotton entering the gin plant and was further adjusted to a lint loss weight per bale.

Prices

Market prices and premiums and discounts were obtained from the DPES. The price equation (Hudson and Ethridge, 1995, pg. 5) used was:

$$\ln P = 2.7847 - 0.00082\,LF^2 - 0.00109\,C1^2 - 0.00705\,DUM1 - 0.03206\,DUM2$$
$$- 0.05592\,DUM3 + 0.056945\,STA - 0.00076\,STA^2 + 0.001088\,STR + 0.211416\,M$$
$$- 0.0255\,M^2 - 0.00036\,LB - 0.01335\,HB - 0.02346\,LO - 0.07774\,HO - 0.07323\,R$$

where

ln = natural logarithm,

LF = leaf grade (1 - 7),

C1 = first digit of the color grade (1 - 7),

DUM1 = binary indicator for the second digit of the color grade (If the second digit = 2, DUM1 = 1; DUM1 = 0 otherwise),

DUM2 = binary indicator for the second digit of the color grade (If the second digit = 3, DUM2 = 1; DUM2 = 0 otherwise),

DUM3 = binary indicator for the second digit of the color grade (If the second digit = 4, DUM3 = 1; DUM3 = 0 otherwise),

STA = staple length in 32nds of an inch,

STR = strength of the cotton in grams/tex,

M = micronaire reading,

LB = percentage of bales in a lot classed as Level 1 bark,

HB = percentage of bales in a lot classed as Level 2 bark,

LO = percentage of bales in a lot classed as Level 1 other extraneous matter,

HO = percentage of bales in a lot classed as Level 2 other extraneous matter,

R = binary indicator for the region (R = 0 if the market is West Texas, R = 1 for East Texas/Oklahoma).

The price associated with the various levels of grade, staple length, fiber strength, micronaire, and percent barky bales was assumed to account for all price changes as quality varied with each discrete level of lint cleaning (one, two, and three). More specifically, prices were assigned to simulated cotton attributes generated by GINQUAL at the three levels of lint cleaning as cotton quality changed with successive lint cleaning.

Cost Estimates

A survey of local ginners was taken and the survey results were used in the GINMODEL to determine ginning costs. The GINMODEL calculates fixed and variable ginning costs for simulated gins at various processing utilization rates and gin capacities. Output from GINMODEL consists of total and per bale ginning costs separated into fixed and variable components. These costs are calculated for processing utilization levels ranging from one-

hundred percent to ten percent. For the purpose of this analysis, per bale ginning cost was simulated for three categories of gins, owning and operating one, two, and three lint cleaners. It was assumed that gins were operating at one-hundred percent utilization[2]. These gins ranged in size from: gins owning and operating one lint cleaner, gins owning and operating two lint cleaners, and gins owning and operating three lint cleaners.

The costs associated with lint loss in the gin plant due to precleaning and successive levels of lint cleaning were estimated by multiplying price estimates obtained from DPES and the lint loss calculated from the GINQUAL outputs for different cultivars, different harvest dates, and different levels of lint cleaning. Total ginning cost per bale and the cost of total lint loss per bale were added to obtain a total ginning cost to the producer for each of the configurations.

Optimization Estimates

The optimal level of lint cleaning in the gin plant for the various cultivars and harvest dates was determined by examining the behavior of net revenues associated with each additional lint cleaning. Per bale total revenues associated with lint cleaning were estimated by multiplying the prices per kilogram for each simulated condition by 218 (1 bale = 218 kg (480 lbs.)). Net revenues associated with each level of lint cleaning for each simulated condition were calculated by subtracting the total cost (total ginning cost per bale plus the cost of lint loss per bale) from total revenues.

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[2] Ninety to 50 percent utilizations are not reported in this study because no differences were observed from the results found with one-hundred percent utilization.

Findings

The results of this study are presented in terms of quality and prices of cotton at one, two, and three stages of lint cleaning by cultivar and harvest date (table 1) and costs and revenues for each simulated condition (table 2). The findings indicate that one stage of lint cleaning consistently provided the greatest net return of all eighteen simulations.

Quality

Successive lint cleanings decreased staple length and increased fiber strength in all cases (table 1). Micronaire reading showed no change with the second or third lint cleaning and in most cases across harvest dates. Although these results are consistent with the findings of Ethridge et al. (1995), it is not clear why no change in the micronaire reading was observed. However, given that the scope of this study was to determine the optimal number of lint cleanings, not optimal harvest date, this limitation should not have any serious implications.

Barky bale percentage decreased with successive lint cleanings for all cases except one cultivar (Deltapine 90). Color grade for early harvested cotton remained the same from one to two lint cleanings in all but one case, but decreased (better color grade) with three cases from two to three lint cleanings. The second lint cleaning, for the midseason harvest, decreased the color grade in one half of the cases. The third lint cleaning had no effect on color grade for 5 of the 6 cultivars. Color grade, for late season harvest, remained the same in four cases and increased in two cases between one and two lint cleanings, while remaining the same for all cases between two and three lint cleanings. Leaf grade for early, mid, and late harvested cotton decreased (less leaf) with the second lint cleaning. The third lint cleaning had no affect on leaf grades of midseason

and late harvested cotton, but it decreased leaf grade in half of the cases of early season harvested cotton.

Price

Price effects were derived from differences in various attributes by using the price equation shown previously. The estimated average price for the first stage of lint cleaning across cultivars amounted to 1.55$/kg (70.31¢/lbs.), 1.53$/kg (69.58¢/lbs.), and 1.53$/kg (69.58¢/lbs.) for early, mid, and late season harvest, respectively. The second lint cleaning resulted in an increase in the price per kilogram in 16 of the 18 situations, while the third lint cleaning reduced the price in all but six cases.

Average lint price across all cultivars and harvest dates amounted to 1.54$/kg (69.74¢/lbs.), 1.55$/kg (70.35¢/lbs.), and 1.55$/kg (70.44¢/lbs.) for one, two, and three lint cleanings, respectively. On average, the price of cotton at various stages of lint cleaning showed an increase in price as the number of lint cleanings increased. The increase in price for successive stages of lint cleaning in this study was significantly less than the increases reported by Ethridge et al. (1995). This difference could be attributed to differences in the more recent pricing structure used in this study relative to that which existed in 1992.

Costs

Estimated ginning costs per bale increased with each additional lint cleaning, but only by $0.38 and $0.32/bale for the first and second lint cleanings, respectively. The increase in total ginning cost for successive stages of lint cleaning represent increases in the total fixed cost of additional lint cleaners and the additional energy required for additional lint cleanings.

Estimated lint turnout decreased with later harvest dates and varied by cultivar. The lint loss at various stages of lint cleaning demonstrates that successive stages of lint cleaning consistently increase lint loss, but that lint loss increases at a decreasing rate as the amount of lint cleaning increases. Average lint weight loss associated with precleaning and one lint cleaning amounted to 15.39 kg/bale (33.90 lbs./bale), 15.89 kg/bale (35.00 lbs./bale), and 16.48 kg/bale (36.30 lbs./bale) for early, mid, and late season harvested cotton, respectively. The second and third lint cleanings increased lint losses across all cultivars and all harvest dates. The average weight of lint loss across all cultivars and harvest dates was estimated at 15.92 kg/bale (35.07 lbs./bale) for precleaning and one lint cleaning, 20.43 kg/bale (45.00 lbs./bale) for precleaning and two lint cleanings, and 22.10 kg/bale (48.68 lbs./bale) for precleaning and three lint cleanings, or an average additional lint loss of about 4.09 kg/bale (9.01 lbs./bale) and 1.68 kg/bale (3.70 lbs./bale) for the second and third lint cleanings, respectively.

The cost of lint losses in the gin plant, as with the weight of lint loss, increased with later harvest dates and with successive stages of lint cleaning (table 2). Across cultivars and harvest dates, the average cost of lint losses was $24.45/bale, $31.59/bale, and $34.30/bale for one, two, and three lint cleanings, respectively. These losses represent an additional loss of about $7.00/bale for the second lint cleaning and about $2.70/bale for the third lint cleaning.

Net Returns From Lint Cleaning

Revenues, costs, and net returns, standardized for a bale of lint cotton, are presented in table 2. The highest net returns were experienced with one lint cleaning in all cases across all harvest dates and all cultivars. It was observed that net revenues decreased with each additional

lint cleaning in all cases except one, with the largest reduction observed between one and two lint cleanings.

The second stage of lint cleaning reduced net revenues by an average of $4.69/bale, $3.63/bale, and $5.31/bale for early, midseason, and late harvest, respectively. The third lint cleaning decreased net revenues by an average of $1.19/bale for early harvest, $3.12/bale for midseason harvest, and $3.71/bale for late season harvest. Average decreases in net revenues across cultivars and harvest dates amounted to $4.54/bale for the second lint cleaning and $2.67/bale for the third lint cleaning.

Summary and Conclusions

This analysis simulated net returns per bale of cotton for each of six stripper harvested cotton cultivars, with early, midseason, and late harvest dates. Gin turnout and quality attributes for one, two, and three stages of lint cleaning in the gin plant were simulated for each of the 18 cases using the GINQUAL simulator. Cotton prices were estimated from price relationships determined by the DPES and gross revenues calculated for the various stages of lint cleaning. Ginning costs were estimated using the GINMODEL simulator which calculated variable, fixed, and total cost per bale for ginning cotton using one, two, and three lint cleaners. Costs associated with lint loss in the gin plant were estimated and adjusted to a per bale lint loss cost through the use of gin turnout percentages provided by GINQUAL and the estimated price per kilogram determined from the pricing equation.

The study found that net returns were consistently higher for one lint cleaning in the gin plant for all cultivars regardless of the time of harvest. Two lint cleaning decreased net revenue by an average of $4.54/bale, with a range of $7.35 to $1.92/bale, when compared to one lint

cleaning. Two lint cleanings provided higher net returns than three lint cleanings in all but one case by an average of $2.67/bale.

Currently, existing practice calls for two lint cleanings in the gin plant. Previous research on machine-stripped cotton had also suggested that two lint cleanings were the best general rule. Ethridge et al. (1995), however, had indicated that less lint cleaning at the gin plant could become optimal if lint cleaning technology or market pricing structures change. It would appear that the pricing structure has been changed with the inception of the HVI measurements of fiber attributes in 1993. This change in the pricing structure may be primarily responsible for redefining the optimal level of lint cleaning at the gin plant as determined in this study.

This is the first analytical study which consistently indicates one lint cleaning as returning maximum net revenues to cotton producers regardless of harvest date or cultivar. Caution should be used, however, in generalizing the results of this study. The conclusions and implications to be drawn from this study are limited to the simulated conditions and the Texas-Oklahoma market since the estimated prices reflect market premiums and discounts for only this market. Further, this study did not consider the effects of prep on the price. In addition, it is recognized that the results of this study are based on the market price structure that existed in 1994/1995 crop year. Any further change in the pricing structure may alter the findings of this study.

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Table 1. Quality and prices of cotton at one, two, and three stages of lint cleaning by cultivar and harvest date.

Lint Cleanings (No.)	Color Grade	Trash Grade	Staple Length	Fiber Strength	Micronaire	Barky Bale Percentage	Price $/kg
Paymaster HS26 Early Harvest							
1	41	5	33.0	24.83	4.34	39	1.5635
2	31	4	32.8	25.50	4.34	28	1.5861
3	31	3	32.6	26.17	4.34	23	1.5941
Paymaster HS26 Midseason Harvest							
1	41	5	33.0	24.83	4.34	39	1.5635
2	41	3	32.8	25.50	4.34	28	1.5741
3	41	3	32.6	26.17	4.34	23	1.5730
Paymaster HS26 Late Harvest							
1	41	5	33.0	24.83	4.33	40	1.5635
2	41	4	32.8	25.50	4.33	28	1.5741
3	41	4	32.6	26.17	4.33	23	1.5730
Paymaster 145 Early Harvest							
1	41	5	31.2	23.14	4.25	42	1.5389
2	41	4	31.1	23.75	4.25	30	1.5499
3	41	3	30.8	24.35	4.25	25	1.5552
Paymaster 145 Midseason Harvest							
1	51	5	31.2	23.14	4.24	43	1.5239
2	51	4	31.1	23.75	4.24	30	1.5349
3	51	4	30.8	24.35	4.24	25	1.5313
Paymaster 145 Late Harvest							
1	51	5	31.2	23.14	4.24	44	1.5239
2	51	4	31.1	23.75	4.24	31	1.5349
3	51	4	30.8	24.35	4.24	26	1.5313

Table 1 (Continued). Quality and prices of cotton at one, two, and three stages of lint cleaning by cultivar and harvest date.

Lint Cleanings (No.)	Color Grade	Trash Grade	Staple Length	Fiber Strength	Micronaire	Barky Bale Percentage	Price $/kg
All-Tex Atlas Early Harvest							
1	41	5	34.2	27.97	3.68	73	1.5725
2	41	4	34.0	28.62	3.68	52	1.5838
3	31	4	33.8	29.28	3.68	43	1.5954
All-Tex Atlas Midseason Harvest							
1	51	5	34.2	27.97	3.68	74	1.5572
2	41	4	34.0	28.62	3.68	53	1.5838
3	41	4	33.8	29.28	3.68	44	1.5733
All-Tex Atlas Late Harvest							
1	51	5	34.2	27.97	3.68	75	1.5572
2	51	4	34.0	28.62	3.68	53	1.5838
3	51	4	33.8	29.28	3.68	44	1.5833
All-Tex Quickie Early Harvest							
1	31	5	33.6	25.53	3.50	87	1.5672
2	31	4	33.4	26.08	3.50	62	1.5780
3	31	4	33.2	26.64	3.50	51	1.5770
All-Tex Quickie Midseason Harvest							
1	41	5	33.6	25.53	3.50	88	1.5552
2	41	4	33.4	26.08	3.50	63	1.5660
3	31	4	33.2	26.64	3.50	52	1.5770
All-Tex Quickie Late Harvest							
1	41	5	33.6	25.53	3.50	90	1.5552
2	41	4	33.4	26.08	3.50	64	1.5659
3	41	4	33.2	26.64	3.50	53	1.5650

Table 1 (Continued). Quality and prices of cotton at one, two, and three stages of lint cleaning by cultivar and harvest date.

Lint Cleanings (No.)	Color Grade	Trash Grade	Staple Length	Fiber Strength	Micronaire	Barky Bale Percentage	Price $/kg
Deltapine 90 Early Harvest							
1	41	5	32.1	23.21	3.03	100	1.5030
2	41	4	32.0	23.64	3.03	100	1.5136
3	31	4	31.7	24.07	3.03	100	1.5220
Deltapine 90 Midseason Harvest							
1	51	5	32.1	23.21	3.03	100	1.4883
2	41	4	32.0	23.64	3.03	100	1.5136
3	41	4	31.7	24.07	3.03	100	1.5104
Deltapine 90 Late Harvest							
1	51	5	32.1	23.21	3.03	100	1.4883
2	52	4	32.0	23.64	3.03	100	1.4883
3	52	4	31.7	24.07	3.03	100	1.4851
GSC 25 Early Harvest							
1	41	6	33.0	25.13	3.12	100	1.5101
2	41	5	32.8	25.62	3.12	100	1.5224
3	31	4	32.6	26.11	3.12	99	1.5441
GSC 25 Midseason Harvest							
1	51	5	33.0	25.13	3.12	100	1.5089
2	41	4	32.8	25.62	3.12	100	1.5337
3	41	4	32.6	26.11	3.12	88	1.5324
GSC 25 Late Harvest							
1	51	5	33.0	25.13	3.12	100	1.5089
2	52	4	32.8	25.62	3.12	100	1.5081
3	52	4	32.6	26.11	3.12	90	1.5067

Table 2. Lint loss, cost of lint loss, ginning cost, total cost, total revenue, and net revenue per bale for different cultivars and different harvest dates.

Lint Cleanings (No.)	Lint Loss (kg)	Cost of Lint Loss ($)	Ginning Cost ($)	Total Cost ($)	Total Revenue ($)	Net Revenue ($)
	---------- per bale ----------					
Paymaster HS26 Early Harvest						
1	15.0534	23.5354	41.38	64.9154	340.7105	275.7951
2	19.5029	30.9341	41.76	72.6941	345.6491	272.9549
3	21.1648	33.7396	42.08	75.8196	347.3952	271.5756
Paymaster HS26 Midseason Harvest						
1	15.5140	24.2556	41.38	65.6356	340.7105	275.0748
2	19.9681	31.4313	41.76	73.1913	343.0219	269.8305
3	21.6733	34.0915	42.08	76.1715	342.7814	266.6099
Paymaster HS26 Late Harvest						
1	15.9971	25.0108	41.38	66.3908	340.7105	274.3196
2	20.4561	32.1993	41.76	73.9593	343.0219	269.0625
3	22.2069	34.9308	42.08	77.0108	342.7814	265.7706
Paymaster 145 Early Harvest						
1	14.9178	22.9569	41.38	64.3369	335.3567	271.0198
2	19.3541	29.9969	41.76	71.7569	337.7554	265.9984
3	21.0108	32.6770	42.08	74.7570	338.9194	264.1624
Paymaster 145 Midseason Harvest						
1	15.7595	24.0167	41.38	65.3967	332.0986	266.7019
2	20.1472	30.9229	41.76	72.6829	334.4752	261.7922
3	21.8694	33.4893	42.08	75.5693	333.7069	258.1376
Paymaster 145 Late Harvest						
1	16.5632	25.2415	41.38	66.6215	332.0986	265.4771
2	21.0153	32.2555	41.76	74.0155	334.4752	260.4597
3	22.6898	34.7455	42.08	76.8255	333.7069	256.8813

Table 2 (Continued). Lint loss, cost of lint loss, ginning cost, total cost, total revenue, and net revenue per bale for different cultivars and different harvest dates.

Lint Cleanings (No.)	Lint Loss (kg)	Cost of Lint Loss ($)	Ginning Cost ($)	Total Cost ($)	Total Revenue ($)	Net Revenue ($)
	---------- per bale ----------					
All-Tex Atlas Early Harvest						
1	15.8487	24.9227	41.38	66.3027	342.6867	276.3840
2	20.3526	32.2346	41.76	73.9946	345.1423	271.1477
3	22.1215	35.2926	42.08	77.3726	347.6700	270.2973
All-Tex Atlas Midseason Harvest						
1	16.4675	25.6428	41.38	67.0228	339.3402	272.3173
2	20.9803	33.2285	41.76	74.9885	345.1411	270.1525
3	22.6781	35.9055	42.08	77.9855	342.8494	264.8639
All-Tex Atlas Late Harvest						
1	17.0144	26.4945	41.38	67.8745	339.3402	271.4657
2	21.5366	34.1096	41.76	75.8696	345.1411	269.2714
3	23.2840	36.8648	42.08	78.9448	342.8494	263.9046
All-Tex Quickie Early Harvest						
1	15.8209	24.7939	41.38	66.1739	341.5153	275.3414
2	20.0895	31.7003	41.76	73.4600	343.8674	270.4070
3	21.6541	34.1481	42.08	76.2281	343.6553	267.4272
All-Tex Quickie Midseason Harvest						
1	15.3037	23.8009	41.38	65.1809	338.9193	273.7384
2	19.8132	31.0264	41.76	72.7864	341.2524	268.4659
3	21.5399	33.9679	42.08	76.0479	343.6541	267.6062
All-Tex Quickie Late Harvest						
1	15.9428	24.7946	41.38	66.1746	338.9158	272.7411
2	20.3593	31.8815	41.76	73.6415	341.2512	267.6096
3	22.1387	34.6466	42.08	76.7266	341.0407	264.3140

Table 2 (Continued). Lint loss, cost of lint loss, ginning cost, total cost, total revenue, and net revenue per bale for different cultivars and different harvest dates.

Lint Cleanings (No.)	Lint Loss (kg)	Cost of Lint Loss ($)	Ginning Cost/bale ($)	Total Cost ($)	Total Revenue ($)	Net Revenue ($)
	---------- per bale ----------					
Deltapine 90 Early Harvest						
1	15.4204	23.1763	41.38	64.5563	327.5264	262.9700
2	19.9148	30.1422	41.76	71.9022	329.8354	257.9331
3	21.6798	32.9959	42.08	75.0759	331.6670	256.5911
Deltapine 90 Midseason Harvest						
1	16.1382	24.0183	41.38	65.3983	324.3291	258.9307
2	20.5250	31.0659	41.76	72.8259	329.8354	257.0095
3	22.2190	33.5596	42.08	75.6396	329.1460	253.5064
Deltapine 90 Late Harvest						
1	16.6764	24.8194	41.38	66.1994	324.3291	258.1297
2	21.0690	31.3560	41.76	73.1160	324.3210	251.2049
3	22.8123	33.8797	42.08	75.9597	323.6432	247.6835
GSC 25 Early Harvest						
1	15.2926	23.0927	41.38	64.4727	329.0708	264.5981
2	20.0026	30.4526	41.76	72.2126	331.7689	259.5563
3	21.7619	33.6014	42.08	75.6814	336.4795	260.7980
GSC 25 Midseason Harvest						
1	16.1382	24.3502	41.38	65.7302	328.8109	263.0806
2	20.6436	31.6613	41.76	73.4213	334.2264	260.8051
3	22.3385	34.2310	42.08	76.3109	333.9351	257.6241
GSC 25 Late Harvest						
1	16.6764	25.1624	41.38	66.5424	328.8109	262.2685
2	21.1910	31.9575	41.76	73.7175	328.6386	254.9211
3	22.9354	34.5577	42.08	76.6377	328.3498	251.7121