MAXIMIZING NET PRODUCER RETURNS TO GIN LINT CLEANING

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Abstract

This study examined the simulated net returns to gin lint cleaning in the Southern High Plains of Texas during the 1993, 1994, and 1995 crop years to determine the optimum number of lint cleanings in the gin plant. Net returns for five stripper harvested cotton varieties with different management practices, including the use of irrigation and a portable bur-extractor, were evaluated in this study. Results indicated that net returns were consistently higher for one lint cleaning in the gin plant for all of the management practices evaluated. It was found that producers could have saved about $4.00 /bale by lint cleaning cotton once.

Introduction

Eighty-five percent of the cotton produced in Texas is currently stripper harvested. Harvested cotton contains a mixture of lint, seed, and foreign matter such as burs, sticks, leaves, hulls, and non-plant materials such as sand and rocks. The cotton cleaning process to remove this foreign matter includes many different stages. This process has recently been broadened to include cleaning during the harvesting stage, but most of the extraneous matter is still being removed in the ginning process. The ginning process can vary greatly in the overhead cleaning configuration and the number of lint cleaners that are used. Gin plants have the option of using between zero and three lint cleaners.

The persisting question with cotton cleaning is determining the optimum number of lint cleanings in the gin plant required to maximize producer net returns. Many previous studies have suggested two lint cleanings to be optimum for maximizing producer net revenues. Ethridge et al. (1995) found that two lint cleanings were generally optimum when considering the effects on prices, lint loss, and the cost of lint cleaning. However, the cost estimates used by Ethridge et al. (1995) considered only the energy costs of lint cleanings, and the estimated price per pound of lint was based on a pre-HVI market price structure that existed in 1992. Bennett et al.'s (1997) study differed from Ethridge et al.'s (1995) study in that it found one lint cleaning to consistently provide higher producer net returns for cotton varieties with three harvest dates in the 1994/1995 cotton crop. Bennett et al.'s (1997) study considered the total ginning cost associated with sequential stages of lint cleaning and the cost of lint loss in the gin plant. Also, the estimated prices were based on the HVI measurements of fiber attributes and recent pricing structures.

This study expands on Bennett et al.'s (1997) study by examining the net revenues of five cotton varieties commonly grown in the Southern High Plains of Texas with various management practices. Currently, much of the cotton grown in the Southern High Plains of Texas is irrigated. Also, producers have the option to incorporate the use of a portable bur-extractor in the stripper harvesting process of cotton. The objective of this study is to determine the optimum number of lint cleanings in the gin plant to maximize producer net returns for dryland, irrigated, non-bur-extracted, and bur-extracted cotton varieties that were commonly grown in the Southern High Plains of Texas during the 1993, 1994, and 1995 cotton crops.

Methods and Procedures

Many components were necessary to determine the optimum number of lint cleanings required to maximize producer net returns. The effects of successive lint cleanings on cotton quality attributes and turnout percentages were determined by using a cotton processing quality simulation model, GINQUAL (Barker et al., 1991). The output from GINQUAL was incorporated into the 1993, 1994, and 1995 price equations produced by Daily Price Estimation System, DPES, (Hudson et al., 1994; Hudson and Ethridge, 1995; Floeck et al., 1996) to estimate costs of lint loss and revenues at sequential stages of lint cleaning. Total ginning costs for successive stages of lint cleanings were determined using a ginning cost simulator, GINMODEL. Estimates from the DPES and GINMODEL were used to calculate net revenues. The net revenues were evaluated in order to determine the optimum number of lint cleanings required to maximize producer net returns.

The five stripper cotton varieties analyzed include Paymaster HS200, Paymaster HS26, Paymaster 145, All-Tex Atlas, and Deltapine 2156. This study also accounted for a broad spectrum of management practices. Portable stripper mounted bur-extractors are presently available to be used in the stripper harvesting process to remove extraneous matter, such as burs, sticks, leaves, hulls, sand, and rocks. Producers also have the option to irrigate the cotton crop. Therefore, four combinations of each variety of stripper harvested cotton were examined at successive stages of lint cleaning. The combinations include non-bur-extracted - dryland, non-bur-extracted - irrigated, bur-extracted - dryland, and bur-extracted - irrigated. Thus, twenty different scenarios were considered for each year, or a total of sixty different scenarios for the three year study period.

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Cotton Quality Attributes

Changes in grade, staple length, fiber strength, length uniformity, and micronaire resulting from successive stages of 0, 1, 2, and 3 lint cleanings were determined using the GINQUAL simulation model. The turnout percentage of lint was also derived using GINQUAL.

Initial values used in GINQUAL for the micronaire, length, strength, and uniformity of each irrigated and dryland cotton variety were obtained from the 1993, 1994, and 1995 Cotton Performance Tests (Gannaway et al., 1993, 1994, 1995). The non-bur-extracted stripper harvested cotton was simulated through the GINQUAL model at a rate of 15 bales per hour, while the bur-extracted simulation ginning rate varied in order for the pounds per minute to remain constant. The harvested cotton was simulated through a single 96 inch 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. Three 88 inch wide ginstands were used in the process. The lint cleaning simulation used zero to three 88 inch wide sequential lint cleaners with a combing ratio of 25 and 16 inch diameter saws operating at 900 rpm. The drying temperatures of the first and second tower dryers were held constant at 300 and 150 degrees Fahrenheit, respectively, and the atmospheric temperature and relative humidity at 60 degrees and 30 percent, respectively. The values for initial trash and moisture content that were provided by GINQUAL were used in the simulation for non-bur-extracted cotton. The values for bur-extracted hull and stick percents were decreased by 62.85 and 28.66 percent, respectively, based on Bennet et al.'s (1995) finding.

Price Estimates

Market prices and premiums and discounts for cotton after one, two, and three lint cleanings for the 1993, 1994, and 1995 crops were calculated by using the yearly cotton pricing equations that were generated by Daily Price Estimation System (DPES). The 1993 price equation (Hudson et al., 1994) used was:

$$\ln P = 1.756522 - 0.00135LF^2 - 0.00204C1^2 - 0.00516C2^2 + 0.080045STA - 0.00105STA^2 + 0.001769STR + 0.342792M - 0.0414M^2 - 0.01761LB - 0.21302HB - 0.04405LO - 0.14982HO + 0.00213R$$

where ln is the natural logarithm, P is the lot price in cents per pound, LF is the leaf grade (1-7), C1 is the first digit of the color grade, C2 is the second digit of the color grade, STA is the staple length in 32nds of an inch, STR is the strength of cotton in grams/tex., M is the micronaire reading, LB and HB are the level 1 and 2 bark percentages, LO and HO are the level 1 and 2 other extraneous matter percentages, respectively, and R is the binary indicator for the region (R = 0 if the market region is West Texas, R = 1 for East Texas/Oklahoma).

The 1994 price equation (Hudson and Ethridge, 1995) used was:

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

where DUM1, DUM2, and DUM3 are the binary indicators for the second digit of the color grade (if the second digit = 2, DUM1 = 1; DUM2 = DUM3 = 0, if the second digit = 3, DUM2 = 1; DUM1 = DUM3 = 0, and if the second digit = 4, DUM3 = 1; DUM1 = DUM2 = 0) and all other variables are as defined before.

The 1995 price equation (Floeck et al., 1996) used was:

$$\ln P = 1.92205 + 0.00646LF - 0.00149LF^2 - 0.00120C1^2 - 0.00625DUM1 - 0.01050DUM2 - 0.01144DUM3 + 0.08344STA - 0.00116STA^2 + 0.00178STR + 0.44533M - 0.05574M^2 - 0.01620LB - 0.07677HB - 0.04290LO - 0.14088HO - 0.00162R$$

where all of the variables are as defined earlier.

It was assumed that the price associated with the levels of grade, staple length, fiber strength, micronaire, and barky bale percent accounted for all changes in price as quality varied with each sequential stage of lint cleaning.

Cost Estimates

The simulated ginning costs were estimated for three main categories of gins. These include gin plants with the capacity of processing 14, 18, and 21 bales per hour. Each of these were broken down into three categories of gins, including those owning and operating one, two, and three lint cleaners. Total and per bale costs, which were separated into fixed and variable components, were derived from GINMODEL. The total per bale ginning cost estimates (fixed plus variable per bale costs) were used for the purpose of this study. It was assumed that these costs were estimated for gins that were operating at one-hundred percent utilization.

The lint loss, in pounds, for each level of lint cleaning was found by subtracting the pounds of lint cotton of the current level of lint cleaning from that of its prior lint cleanings. The lint loss, in pounds per bale, was derived by dividing the total lint loss for each level of lint cleaning, in pounds, by the pounds of lint cotton and then multiplying by 480 pounds (1 bale = 480 pounds). The total lint loss, in pounds per bale, was calculated by summing the lint loss for each successive stage of lint cleaning.

The lint loss cost, in dollars per bale, due to precleaning and successive lint cleanings was derived by multiplying the price from DPES by the total lint loss from GINQUAL for zero to three stages of lint cleaning for all varieties, management practices, and years. The total ginning cost, in dollars per bale, to the producer for each scenario was calculated by adding the cost of ginning from the GINMODEL and the lint loss cost.

Revenue Estimates

Net revenues were examined in order to determine the optimum number of lint cleanings for each scenario considered. The number of pounds of lint cotton were determined by multiplying the turnout percent from GINQUAL by 2300 pounds of initial harvested cotton, which was assumed to produce one bale of cotton.

Total revenues, in dollars per bale, associated with each level of lint cleaning were estimated by multiplying the price per pound obtained from the DPES by 480 pounds. Net revenues associated with lint cleanings were calculated by subtracting the total ginning cost (ginning cost per bale plus the cost of total lint loss per bale) from the total revenues.

Results and Implications

The results for the cotton quality attributes, price estimates, cost estimates, and revenue estimates for the 1993, 1994, and 1995 crop years are separately presented in Appendix Tables 1 through 6. The following sections present the results that are averaged across the three years.

Cotton Quality Attributes

Output from GINQUAL for six main quality attributes were examined in regard to changes between sequential stages of lint cleanings for dryland, irrigated, bur-extracted, and non-bur-extracted cotton varieties. The six quality attributes examined were fiber strength, staple length, leaf grade, color grade, barky bale percentage, and micronaire.

The three year average quality attributes for bur-extracted and non-bur-extracted cotton are presented in Table 1. Results indicated that the average quality attributes improved between successive stages of lint cleanings, but no significant difference in quality attributes was observed between bur-extracted and non-bur-extracted cotton for the three crop years examined. The fiber strength increased at a fairly constant rate between lint cleanings for each management practice (Table 1). Average fiber strength for irrigated and dryland varieties were found to increase by 0.67 and 0.59, respectively, for successive stages of lint cleanings.

An improvement in leaf grade (trash), barky bale percentage, and color grade were observed between sequential lint cleanings. Results indicated that the average leaf grade and barky bale percentage were greater for dryland cotton varieties than the irrigated varieties (Table 1). Decreases in average leaf grades of 0.97 and 0.10 for irrigated cotton and 0.83 and 0.30 for dryland cotton were experienced for sequential lint cleanings, while the barky bale percentage decreased by an average of 3.23 and 1.40 for irrigated cotton and 2.73 and 1.03 for dryland cotton. The average color grade decreased with successive stages of lint cleanings at a constant rate of 0.30 for irrigated cotton and 0.13 and 0.47 for dryland cotton. The staple length decreased with increasing amounts for successive lint cleanings. The average staple length for irrigated cotton was consistently higher than dryland cotton for the three years (Table 1).

Price Estimates

The pricing equations shown previously were used to derive the price effects resulting from differences in quality attributes due to various management practices. The lint prices, averaged across the three years, for the irrigated cultivars were found to be 65.2¢/lb., 66.1¢/lb., and 66.3¢/lb for one, two, and three lint cleanings, respectively. The lint prices for the dryland cultivars were 62.1¢/lb., 62.7¢/lb., and 63.1¢/lb. for one, two, and three lint cleanings, respectively (Table 2). There was no significant difference between bur-extracted and non-bur-extracted cotton for either irrigated or dryland cultivars. The dryland cotton prices were found to be slightly lower than the irrigated cotton prices.

The estimated average prices for each management practice of the three crop years increased with successive stages of lint cleanings. The average irrigated cotton price increased from one to two and two to three lint cleanings by about 0.83¢/lb. and 0.25¢/lb., respectively (Table 2). The average dryland cotton price increased by about 0.58¢/lb from one to two lint cleanings and about 0.43¢/lb. from two to three lint cleanings (Table 2).

Cost Estimates

The ginning cost was estimated by incorporating secondary data into the ginning cost simulation model, GINMODEL, for successive stages of lint cleanings for three main categories of gins. These categories include those gins with the processing capacity of 14, 18, and 21 bales per hour.

Results indicated that non-bur-extracted cotton experienced a ginning cost of $6.50 to $7.00 per bale higher than bur-extracted cotton. Ginning cost for irrigated cotton was about $54.16/bale, $54.61/bale, and $55.09/bale for one, two, and three lint cleanings, respectively (Table 2). Ginning cost for dryland cotton was about $1/bale cheaper than for irrigated cotton at $53.24/bale for one lint cleaning, $53.69/bale for two lint cleanings, and about $54.15/bale for three lint cleanings (Table 2). However, the average ginning costs for both irrigated and dryland cotton increased by about $0.45/bale from one to two lint cleanings and $0.46/bale to $0.48/bale from two to three lint cleanings, respectively (Table 2). The fixed cost of additional lint

cleaners and the additional required energy to operate additional lint cleaners is the cause for the increase in ginning costs for successive stages of lint cleanings.

The amount of lint loss and cost of lint loss increased at a decreasing rate with sequential stages of lint cleanings. The irrigated cotton varieties generally experienced a slightly lower lint loss than the dryland cotton varieties (Table 2). However, the loss of saleable lint for both irrigated and dryland cotton varieties increased at about the same rate of 10.39 lbs/bale during the second lint cleaning and 4.04 lbs/bale during the third lint cleaning (Table 2). No significant difference in the amount of lint loss between bur-extracted and non-bur-extracted cotton was observed (Table 2). The cost of lint loss was generally higher for irrigated cotton than for dryland cotton. The average lint loss cost for irrigated cotton varieties increased from one to two lint cleanings by $7.20/bale and by $2.83/bale from two to three lint cleanings. For dryland cotton varieties, the lint loss cost increased by about $8.00/bale and $2.80/bale with successive lint cleanings.

The total ginning cost (ginning cost plus cost of lint loss) for irrigated cotton was slightly higher than for dryland cotton. However, no significant difference in total cost was observed between bur-extracted and non-bur-extracted cotton. The total ginning cost for irrigated and dryland cotton increased from one to two lint cleanings by about $7.65/bale and $7.11/bale, respectively, and from two to three lint cleanings by about $3.30/bale.

Revenue Estimates

The revenues above total ginning cost were examined in order to determine the optimum number of lint cleanings to maximize producer net returns. Table 2 presents the revenues, costs, and net returns for the different management practices, averaged across the 1993, 1994, and 1995 crop years.

Results indicated that irrigated cotton consistently experienced higher net returns than dryland cotton. Net returns for bur-extracted cotton were also consistently higher than the non-bur-extracted management practice. Net returns for bur-extracted management practice were about $6.00/bale higher for irrigated cotton varieties and about $9.00/bale higher for dryland varieties than the non-bur-extracted management practice (Table 2). Average net returns for irrigated cotton varieties was about $13.00/bale higher than dryland cotton varieties.

Results further indicated that net returns for producers were consistently the highest for one lint cleaning in the gin plant. For irrigated cotton varieties, producer net returns decreased by an average of $3.46/bale from one to two lint cleanings in the gin plant. Producer net returns for dryland cotton varieties decreased by an average of $4.42/bale when cotton was lint cleaned twice in the gin plant. Thus, on average, it was found that producers could possibly save about $4/bale by lint cleaning cotton once in the gin plant.

Summary and Conclusion

Two lint cleanings in the gin plant are currently called for in the industry. Bennett et al. (1997) examined the optimum number of lint cleanings for the 1994 crop year and found that one lint cleaning maximized producer net returns for all cases examined. This study expanded on the research of Bennett et al. (1997) to determine the optimum number of lint cleanings for different management practices, which included the optional use of irrigation and a portable stripper mounted bur-extractor.

This study further reinforces Bennett et al.'s (1997) finding that one lint cleaning in the gin plant maximizes producer net returns. Results clearly indicate that producers could have saved about $4/bale by lint cleaning cotton only once in the gin plant. This is because producers benefit more from a lower lint loss in the gin plant than a smaller increase in price from one to two lint cleanings.

The results of this study should be used with caution. The results are limited by the estimated prices of the Texas/Oklahoma market and to the simulated conditions of GINQUAL and GINMODEL. Also, the results of this study were based on the market structures that existed in the 1993/1994, 1994/1995, and 1995/1996 crop years.

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Table 1. Average micronaire, fiber strength, staple length, trash, color grade, and barky bale percentage for irrigated and dryland varieties grown in the 1993, 1994, and 1995 cotton crop seasons.

Lint Cleanings (No.)	Micro-naire	Strength	Length	Trash	Color Grade	Barky Bale %
Irrigated						
BE*						
1	4.07	26.56	33.37	5.13	4.80	9.73
2	4.07	27.24	33.24	4.20	4.60	6.93
3	4.07	27.92	32.96	4.13	4.20	5.73
NBE**						
1	4.07	26.56	33.37	5.13	4.80	12.73
2	4.07	27.24	33.24	4.13	4.40	9.07
3	4.07	27.92	32.96	4.00	4.20	7.47
AVG						
1	4.07	26.56	33.37	5.13	4.80	11.23
2	4.07	27.24	33.24	4.17	4.50	8.00
3	4.07	27.92	32.96	4.07	4.20	6.60
Dryland						
BE						
1	3.68	26.07	31.97	5.60	4.80	40.93
2	3.68	26.67	31.80	4.87	4.73	38.73
3	3.68	27.26	31.56	4.53	4.20	37.80
NBE						
1	3.68	26.15	31.99	5.54	4.77	37.23
2	3.68	26.75	31.82	4.77	4.69	35.31
3	3.68	27.35	31.58	4.46	4.23	34.54
AVG						
1	3.68	26.11	31.98	5.57	4.78	39.08
2	3.68	26.71	31.81	4.82	4.71	37.02
3	3.68	27.30	31.57	4.50	4.22	36.17

* BE stands for Bur-Extracted

** NBE stands for Non-Bur-Extracted

Table 2. Average lint loss, cost of lint loss, ginning cost, total cost, price, total revenue, and net revenue for irrigated and dryland varieties grown in the 1993, 1994, and 1995 cotton crop seasons.

Lint Cleaning (No.)	Lint Loss (lb/bale)	Cost of Lint Loss ($/bale)	Ginning Cost ($/bale)	Total Cost ($/bale)	Price ($/lb)	Total Revenue ($/bale)	Net Revenue ($/bale)
Irrigated							
BE							
1	43.13	28.13	50.83	78.96	0.652	313.15	234.19
2	53.51	35.29	51.21	86.50	0.660	316.66	230.51
3	57.54	38.14	51.66	89.80	0.663	318.16	228.36
NBE							
1	42.40	27.66	57.48	85.14	0.652	313.01	227.87
2	52.74	34.89	58.00	92.89	0.661	317.51	224.62
3	56.80	37.71	58.51	96.21	0.663	318.45	222.23
AVG							
1	42.77	27.89	54.16	82.05	0.652	313.08	231.03
2	53.13	35.09	54.61	89.70	0.661	317.09	227.57
3	57.17	37.92	55.09	93.00	0.663	318.31	225.30
Dryland							
BE							
1	42.43	26.46	49.81	76.27	0.622	298.68	222.41
2	52.81	33.19	50.19	83.38	0.627	302.46	217.75
3	56.90	36.07	50.62	86.69	0.633	303.64	216.96
NBE							
1	44.72	25.46	56.67	84.59	0.620	297.52	212.92
2	55.13	34.72	57.18	91.70	0.626	300.65	208.75
3	59.13	37.46	57.68	95.13	0.630	302.29	207.16
AVG							
1	43.58	25.96	53.24	80.43	0.621	298.10	217.67
2	53.97	33.96	53.69	87.54	0.627	301.56	213.25
3	58.01	36.76	54.15	90.91	0.631	302.97	212.06

Appendix Table 1. Average micronaire, fiber strength, staple length, trash, color grade, and barky bale percentage for irrigated and dryland varieties grown in the 1993 cotton crop season.

Lint Cleanings (No.)	Micro-naire	Strength	Length	Trash	Color Grade Grade	Barky Bale %
Irrigated						
BE						
1	4.06	24.77	33.04	5.20	4.80	13.60
2	4.06	25.39	32.90	4.20	4.60	9.80
3	4.06	26.01	32.64	4.20	4.20	8.00
NBE						
1	4.06	24.77	33.04	5.20	4.80	17.00
2	4.06	25.39	32.90	4.20	4.40	12.00
3	4.06	26.01	32.64	4.00	4.20	10.00
AVG						
1	4.06	24.77	33.04	5.20	4.80	15.30
2	4.06	25.39	32.90	4.20	4.50	10.90
3	4.06	26.01	32.64	4.10	4.20	9.00
Dryland						
BE						
1	4.01	25.61	32.70	5.20	4.80	7.80
2	4.01	26.25	32.54	4.20	4.60	5.60
3	4.01	26.88	32.28	4.20	4.20	4.60
NBE						
1	4.01	25.61	32.70	5.20	4.80	12.60
2	4.01	26.25	32.54	4.20	4.20	8.80
3	4.01	26.88	32.28	4.00	4.20	7.40
AVG						
1	4.01	25.61	32.70	5.20	4.80	10.20
2	4.01	26.25	32.54	4.20	4.40	7.20
3	4.01	26.88	32.28	4.10	4.20	6.00

Appendix Table 2. Average micronaire, fiber strength, staple length, trash, color grade, and barky bale percentage for irrigated and dryland varieties grown in the 1994 cotton crop season.

Lint Cleanings (No.)	Micro-naire	Strength	Length	Trash	Color Grade	Barky Bale %
Irrigated						
BE						
1	4.07	26.97	33.66	5.00	4.80	1.40
2	4.07	27.66	33.56	4.00	4.40	1.00
3	4.07	28.35	33.26	4.00	4.20	0.80
NBE						
1	4.07	26.97	33.66	5.00	4.80	2.40
2	4.07	27.66	33.56	4.00	4.20	1.80
3	4.07	28.35	33.26	4.00	4.20	1.40
AVG						
1	4.07	26.97	33.66	5.00	4.80	1.90
2	4.07	27.66	33.56	4.00	4.30	1.40
3	4.07	28.35	33.26	4.00	4.20	1.10
Dryland						
BE						
1	4.19	25.67	30.76	5.60	4.80	15.00
2	4.19	26.35	30.56	4.60	4.80	10.60
3	4.19	27.02	30.36	4.20	4.20	8.80
NBE						
1	4.19	25.67	30.76	5.40	4.80	19.60
2	4.19	26.35	30.56	4.40	4.80	13.60
3	4.19	27.02	30.36	4.00	4.20	11.60
AVG						
1	4.19	25.67	30.76	5.50	4.80	17.30
2	4.19	26.35	30.56	4.50	4.80	12.10
3	4.19	27.02	30.36	4.10	4.20	10.20

Appendix Table 3. Average micronaire, fiber strength, staple length, trash, color grade, and barky bale percentage for irrigated and dryland varieties grown in the 1995 cotton crop season.

Lint Cleanings (No.)	Micro-naire	Strength	Length	Trash	Color Grade	Barky Bale %
Irrigated						
BE						
1	4.08	27.94	33.40	5.20	4.80	14.20
2	4.08	28.67	33.26	4.40	4.80	10.00
3	4.08	29.39	32.98	4.20	4.20	8.40
NBE						
1	4.08	27.94	33.40	5.20	4.80	18.80
2	4.08	28.67	33.26	4.20	4.60	13.40
3	4.08	29.39	32.98	4.00	4.20	11.00
AVG						
1	4.08	27.94	33.40	5.20	4.80	16.50
2	4.08	28.67	33.26	4.30	4.70	11.70
3	4.08	29.39	32.98	4.10	4.20	9.70
Dryland						
BE						
1	2.83	26.93	32.46	6.00	4.80	100.00
2	2.83	27.41	32.30	5.80	4.80	100.00
3	2.83	27.89	32.04	5.20	4.20	100.00
NBE						
1	2.89	26.94	32.46	6.00	4.80	100.00
2	2.89	27.42	32.30	5.20	4.80	100.00
3	2.89	27.91	32.04	5.00	4.20	100.00
AVG						
1	2.86	26.93	32.46	6.00	4.80	100.00
2	2.86	27.42	32.30	5.50	4.80	100.00
3	2.86	27.90	32.04	5.10	4.20	100.00

Appendix Table 4. Average lint loss, cost of lint loss, ginning cost, total cost, price, total revenue, and net revenue for irrigated and dryland varieties grown in the 1993 cotton crop season.

Lint Cleaning (No.)	Lint Loss (lbs/bale)	Cost of Lint Loss ($/bale)	Ginning Cost ($/bale)	Total Cost ($/bale)	Price ($/lb)	Total Reve-nue ($/bale)	Net Reve-nue ($/bale)
Irrigated							
BE							
1	43.58	21.81	50.83	72.64	0.501	240.33	167.69
2	53.96	27.45	51.21	78.66	0.509	244.35	165.69
3	57.99	29.68	51.66	81.34	0.512	245.79	164.45
NBE							
1	42.79	21.40	57.48	78.88	0.500	240.18	161.30
2	53.11	27.10	58.00	85.10	0.511	245.14	160.04
3	57.12	29.31	58.51	87.82	0.513	246.30	158.49
AVG							
1	43.18	21.61	54.16	75.76	0.501	240.26	164.50
2	54.53	27.28	54.61	81.88	0.510	244.74	162.86
3	57.56	29.49	55.09	84.58	0.513	246.05	161.47
Dryland							
BE							
1	41.12	20.54	50.83	71.37	0.500	239.86	168.49
2	51.53	26.16	51.21	77.37	0.508	243.73	166.36
3	55.57	28.38	51.66	80.04	0.511	245.08	165.05
NBE							
1	39.89	19.93	57.48	77.41	0.500	239.98	162.56
2	50.29	25.71	58.00	83.71	0.511	245.38	161.67
3	54.23	27.76	58.51	86.27	0.512	245.57	159.30
AVG							
1	40.50	20.23	54.16	74.39	0.500	239.92	165.53
2	50.91	25.93	54.61	80.54	0.519	244.55	164.01
3	54.90	28.07	55.09	83.15	0.511	245.32	162.17

Appendix Table 5. Average lint loss, cost of lint loss, ginning cost, total cost, price, total revenue, and net revenue for irrigated and dryland varieties grown in the 1994 cotton crop season.

Lint Cleaning (No.)	Lint Loss (lbs/bale)	Cost of Lint Loss ($/bale)	Ginning Cost ($/bale)	Total Cost ($/bale)	Price ($/lb)	Total Revenue ($/bale)	Net Revenue ($/bale)
Irrigated							
BE							
1	40.73	28.86	50.83	79.69	0.708	340.03	260.35
2	51.04	36.58	51.21	87.79	0.717	343.96	256.17
3	55.07	39.51	51.66	91.17	0.717	344.25	253.09
NBE							
1	39.19	27.77	57.48	85.25	0.708	340.03	254.78
2	49354	35.58	58.00	93.58	0.718	344.63	251.05
3	53.59	38.44	58.51	96.93	0.717	344.25	247.30
AVG							
1	39.96	28.31	54.16	82.47	0.708	340.03	257.56
2	50.29	36.08	54.61	90.68	0.717	344.29	253.61
3	54.33	38.97	55.09	94.05	0.717	344.25	250.19
Dryland							
BE							
1	38.55	26.46	50.83	77.29	0.688	330.10	252.81
2	48.86	33.79	51.21	85.00	0.693	336.43	247.43
3	52.95	36.96	51.66	88.62	0.698	334.93	246.32
NBE							
1	35.26	24.27	57.48	81.75	0.689	330.68	248.94
2	45.62	31.62	58.00	89.02	0.694	332.91	243.29
3	49.63	34.69	58.51	93.20	0.699	335.41	242.22
AVG							
1	36.91	25.36	54.16	79.52	0.688	330.39	250.87
2	47.24	32.70	54.61	87.01	0.693	334.67	245.36
3	51.29	35.82	55.09	90.91	0.698	335.17	244.27

Appendix Table 6. Average lint loss, cost of lint loss, ginning cost, total cost, price, total revenue, and net revenue for irrigated and dryland varieties grown in the 1995 cotton crop season.

Lint Cleaning (No.)	Lint Loss (lbs/bale)	Cost of Lint Loss ($/bale)	Ginning Cost ($/bale)	Total Cost ($/bale)	Price ($/lb)	Total Revenue ($/bale)	Net Revenue ($/bale)
Irrigated							
BE							
1	45.09	33.72	50.83	84.55	0.748	359.08	274.52
2	55.52	41.83	51.21	93.04	0.753	361.67	269.67
3	59.55	45.22	51.66	96.88	0.759	364.44	267.56
NBE							
1	45.22	33.80	57.48	91.28	0.748	358.82	267.54
2	55.57	42.00	58.00	100.00	0.756	362.77	262.78
3	59.69	45.38	58.51	103.89	0.760	364.80	260.91
AVG							
1	45.15	33.76	54.16	87.91	0.748	358.95	271.03
2	55.55	41.91	54.61	96.52	0.755	362.22	266.23
3	59.62	45.30	55.09	100.39	0.760	364.62	264.23
Dryland							
BE							
1	47.62	32.38	47.78	80.16	0.679	326.09	245.93
2	58.05	39.63	48.15	87.79	0.682	327.23	239.44
3	62.18	42.88	48.53	91.41	0.689	330.92	239.51
NBE							
1	59.02	32.17	55.05	94.62	0.671	321.89	227.27
2	69.48	46.84	55.54	102.38	0.674	323.67	221.29
3	73.53	49.93	56.01	105.94	0.679	325.90	219.96
AVG							
1	53.32	32.28	51.42	87.39	0.675	323.99	236.60
2	63.77	43.24	51.85	95.08	0.678	325.45	230.37
3	67.86	46.40	52.27	98.67	0.684	328.41	229.73