THE COST OF GINNING COTTON – 2019 SURVEY RESULTS

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Introduction

The cost of ginning cotton is an important concern for producers and ginners. Data from this survey provides information about key variable costs as a component of the overall cost of ginning cotton. The data helps to identify trends of gin operation and document how the adoption of new technologies in cotton harvesting and ginning has impacted ginning cost. The new automated web-survey approach, launched in 2020, allows for the current year's data to be stored to allow management to compare their operation to regional and national data. The survey was conducted for the 2019 cotton crop, which produced 19.4 million running bales (USDA-NASS, 2020) and 5.9 million tons of cottonseed (USDA-NASS, 2021). This crop was gathered from 11.6 million acres with an 823 lb/acre average yield. In 2019, there were 531 operating gins, averaging a little over 36,500 bales per gin.

Procedure

Unlike the previous surveys, this survey was completed by each participating cotton gin through a web portal. The link to the survey was supplied to the National Cotton Ginners Association as well as all the regional and state ginning associations. It was stated in the survey that all information pertaining to gin identification would be kept confidential. Ginners were asked to identify variable costs, including labor, bagging and ties, repairs, maintenance, drying, and electrical costs. Gin managers also reported performance information, which included number of bales, ginning rate, length of season, and type of ginning performed (saw or roller ginning). The survey also requested a description and cost of capital improvements, dryer fuel types, bale tie material (wire or plastic), and number of round modules ginned. The data were analyzed by production regions (Southeast (SE), Mid-South (MS), Southwest (SW), West (W)) and divided into four processing categories: gins producing 20,000 or less bales per year, greater than 20,000 to less than 35,000 bales per year, 35,000 to less than 50,000 bales per year, and equal to or greater than 50,000 bales. Labor cost figures included wages, Workers Compensation Insurance, Social Security, fringe benefits, bonuses, etc. In previous surveys (Valco et al., 2003, Valco et al., 2006, Valco et al., 2009, Valco et al., 2012, Valco et al, 2015, and Valco et al, 2018) the four processing categories were listed as gins producing fewer than 15,000 bales per year, 15,000 to 25,000 bales per year, 25,000 to 40,000 bales per year, and greater than 40,000 bales. The change in the four processing categories from previous surveys was due to the trend of a decline in the number of gins but an increase in the number of bales produced from each gin (i.e., as the number of gins continues to decline, the U.S production does not decline resulting in more bales produced per gin). Consequently, the number of gins producing less than 15,000 bales, on a "typical" year, is getting smaller and it was felt the range needed to be adjusted upward to account for changes in the industry.

The data obtained during this survey is unlike the data collected in previous surveys, which was deleted after the paper for the Beltwide proceedings was produced, in that it resides in the National Cotton Ginners Associations database so that ginners can use the data on an ongoing basis to create graphs and see how their gin is doing versus regional or national ginning trends. Confidentiality is still maintained with the data by removing gin identification information. Each individual gin can access their data using and individual account they setup. The data is still available to participants so that a ginner will be able to see how their costs of operation compares on a national and/or regional basis.

Given the fact that the data will be available for use on a regular basis, there were some lessons we learned concerning future surveys and data formatting that should help with data quality preservation for use by participants and ginning association members. The changes for future surveys will include modifications to the gin-survey web site to automate error checking through the addition of:

- Pull down menus and/or radio buttons for certain responses to minimize erroneous numbers and mistakes.
- Logic statements to handle "N/A", "null", or zeros so they do not compromise averages.
- Six sigma rules for data entered.
- Review questions for clarity and needed information.

These changes should help avoid unrealistic entries and make sure the data is as accurate as possible for continued use by the industry and help to ensure that when the live results pages are generated, that they reflect accurate results by which to make management decisions.

Results

Ginners returned 83 surveys, which represented a little over 4.05 million bales or about 21 percent of the bales ginned in the United States. Not all survey questions were completed, or in some cases, entry figures were identified as incomplete and omitted from the data set. One item that was inadvertently not included in this survey was the breakdown of full-time and seasonal labor. Consequently, the labor values are all inclusive (full-time and seasonal) for this survey report. This will be changed in the 2021 version of the web site to break out full-time from seasonal labor.

Table 1 summarizes the Beltwide average, median, minimum, and maximum variable cost. Variable ginning cost and labor cost were summarized according to region and processing categories (Table 2a, 2b, & Figure 1). Gin operational information collected from the returned surveys was reported, by Beltwide and regional averages, in Tables 3a-c. From previous survey data (Table 4), 2019 resulted in a Total Variable cost that was an increase from the 2016 survey but slightly lower than the 2013 survey results. Table 4 shows that Repairs and Labor were the highest costs incurred in any survey conducted thus far. Figures 1 and 2 show the percent breakdown of the respondents based on number of bales ginned and gin capacity, respectively. Figure 2, gin capacity, followed the same numerical breakdown as the processing categories.

Table 1. 2019 Beltwide variable ginning cost per bale summary.

Beltwide Survey		Average Cost per Bale ($/bale)					
	Bales Ginned	Bagging and Ties	Repairs	Electric	Dryer Fuel	Labor	Total Variable
Average	49464	4.36	8.43	4.18	1.12	9.69	24.81
Median	37619	4.51	6.59	3.49	0.72	7.68	22.73
Min	4940	0.95	1.28	1.21	0.01	2.81	3.56
Max	205377	8.87	40.58	17.05	3.62	37.05	82.24
Count	83	65	62	69	69	66	73

Table 2a. 2019 Regional and processing capacity variable ginning cost per bale.

Region*			Average Cost ($/bale)					
	Bales Ginned	Count	Bagging and Ties	Repairs	Electric	Dryer Fuel	Labor	Total Variable
BW	49,464	83	4.36	8.43	4.18	1.12	9.69	24.81
SE	54,827	15	4.59	4.77	4.03	1.29	6.95	18.43
MS	51,953	19	4.27	8.19	3.87	1.20	7.66	21.94
SW	48,886	41	4.35	9.18	3.42	0.74	10.06	25.09
W	36,386	8	4.17	11.15	8.91	2.63	16.79	41.26
Capacity (Bales X 1000)								
<=20	13788	19	4.84	11.96	5.32	0.86	14.34	31.36
>20 to <35	29483	19	4.34	8.00	4.00	1.30	10.54	26.88
35 to <50	40394	9	3.88	5.25	3.32	1.11	6.74	17.96
>=50	82010	35	4.24	7.79	3.84	1.17	7.63	21.98

* BW- Beltwide, SE - Southeast, MS - Mid-South, SW - Southwest, W- West

Table 2b. 2019 Beltwide and regional labor costs and workers per 10,000 bales.

Region	Average Labor Cost per Bale ($)	Number of Workers per 10K Bale
BW	9.69	4.4
SE	6.95	4.2
MS	7.66	3.4
SW	10.06	5.1
W	16.79	3.7
Capacity (Bales X 1000)		
<=20	14.34	10.48
>20 to <35	10.54	3.86
35 to <50	6.74	3.22
>=50	7.63	1.71

Table 3a. 2019 Gin operational statistics beltwide and by region.

Survey		Bales Ginned		Gin Operation (average)					
Region*	# of returns	Average	Total	Days	# of Shifts	Hours Per Shift	Gin Rate (bale/hr)	Rated Gin Cap. (bales/hr)	kWh /bale
BW	83	49464	4056046	84	1.9	11.9	28.5	40.3	47.3
SE	15	54827	822406	90	1.8	11.9	28.9	39.6	33.9
MS	19	51953	987109	73	2.0	11.8	33.1	45.7	30.1
SW	41	48886	1955440	83	1.9	12.0	29.8	40.6	51.4
W	8	36386	291091	104	2.0	12.0	13.6	29.5	74.9

* BW- Beltwide, SE - Southeast, MS - Mid-South, SW - Southwest, W- West

Table 3b. 2019 Gin operational statistics beltwide and by region.

Survey	Dryer Fuel Type %		Equipment Improvements	
Region*	Natural Gas	LPG	Gins Reporting	Average per Gin ($)
BW	59.0	30.1	36	347875
SE	46.7	40.0	4	695222
MS	42.1	47.4	10	359084
SW	70.7	17.1	20	272117
W	62.5	37.5	2	354718

* BW- Beltwide, SE - Southeast, MS - Mid-South, SW - Southwest, W- West

Table 3c. 2019 Gin operational statistics beltwide and by region.

Survey	Harvest Method (%)		Gin Type (%)	
Region	Conventional Modules	Round Modules	Saw Ginned	Roller Ginned
BW	44	56	92%	8%
SE	44	56	100%	0%
MS	41	59	100%	0%
SW	46	54	95%	5%
W	43	57	24%	76%

* BW- Beltwide, SE - Southeast, MS - Mid-South, SW - Southwest, W- West

Table 4. Comparison of past surveys average variable ginning cost.

Beltwide	Average Cost Per Bale ($/Bale)					
Survey Year	Bag/Ties	Repairs	Electric	Dryer Fuel	Labor	Total Variable
2001	3.36	4.26	3.79	1.26	6.93	19.59
2004	3.72	3.71	3.56	1.96	7.27	20.22
2007	4.16	4.75	3.89	1.84	6.93	21.57
2010	4.33	4.40	3.79	1.39	7.04	20.95
2013	4.78	6.08	4.44	1.67	7.91	24.88
2016	4.51	5.80	3.87	1.27	7.93	23.38
2019	4.36	8.43	4.18	1.12	9.69	24.81

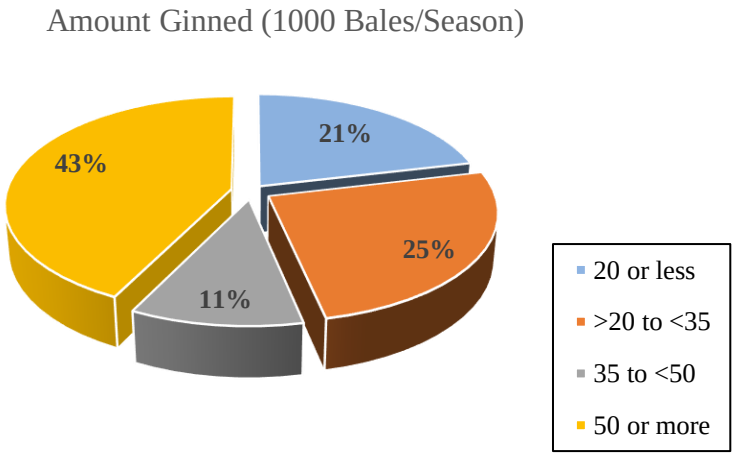

Figure 1. Pie graph of percent of survey respondents based on bales ginned in the 2019 ginning season.

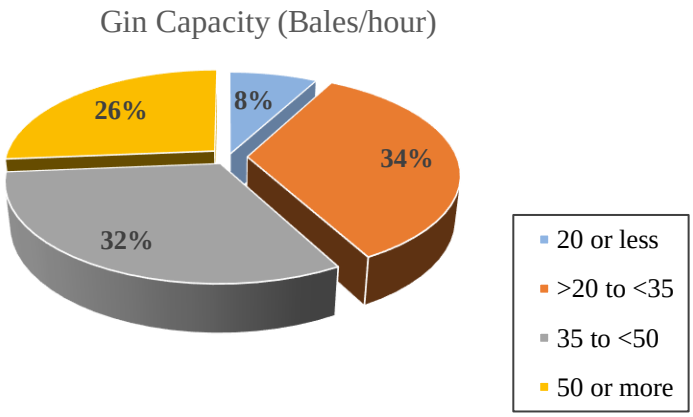

Figure 2. Pie graph of percent of 2019 survey respondents based on gin capacity in bales/hour.

Conclusions

The 2019 cotton crop was the sixth largest produced in the U.S. and was comparable in cost to previous years. Average processing capacity was 49,464 bales per gin, which reflects the large crop with the fewest number of active gins since the surveys began. The average total variable cost was $24.81 per bale, a 5.7% increase over 2016 survey results but a slight decrease (0.28%) from the 2013 survey results. Labor and Repairs were the two largest cost factors reported in this survey, averaging $9.69 and $8.43 per bale, respectively. Regional variable costs data (Table 2a) showed that the SE and MS region gins have the lowest per bale cost at $18.43 and $21.94, respectively. The SW had the third highest cost at $25.09 per bale while the W region had the highest cost at $41.26 per bale. On a regional basis, the kWh/bale (Table 3a) were distinctly higher for SW and W, compared to the 2016 survey, with the W showing a 23.4 kWh/bale increase from 2016. A major part of the higher cost in the W region is the likely attributed to the high percentage of roller gin plants in the region. Since the number of respondents for the W was the same in both the 2016 and 2019 surveys, the increase in kWh/bale could be attributed to the larger crop in 2019 (19.4 million vs 16.7 million) as well as the increase in percent of the crop roller ginned in 2019 compared to 2016 results (76% vs 64%, respectively). For the first time in survey history, the percent of round modules versus conventional modules were greatest across the cotton belt at 56% with the MS reporting the highest percentage at 59%. Unexpectedly, the highest capacity gins (50,000 + bales per year) had the second lowest variable cost (Table 2a) to the second set of mid-range gins (35,00 to <50,000 bale/yr gins) which does not follow the economy of scale seen in previous survey results. However, when looking at the number of gins in each category, the 35,000 to <50,000 bales/yr range had the fewest number of responses (11%) compared to the largest number of responses which came from the 50,000 + bales/yr gins (43% of respondents). In the 2016 survey the percent respondents in each category were more evenly distributed. If a larger sample size of the 35,000 to <50,000 bales/yr gins would have occurred, the variable cost would more than likely have followed the same trend as previous surveys. Ginners

are encouraged to compare their individual cost data with average values to help identify operational status and potential areas of additional focus.

It should be noted that the data in this report is different than the data given in the Beltwide presentation due to data corrections being submitted by some respondents after the Beltwide presentation. Since the goal is to provide accurate data, the numbers presented in this paper should be used over the Beltwide presentation data. One of the more notable differences between the presentation data and the data presented in this report is the average beltwide Total Variable cost which was $23.93 in the slides presented but $24.81 after additional data corrections were made to some respondent's information, which is one of the items that brought to our attention the need for enhanced error checking on the web site gin survey entry form. Likewise, data corrections resulted in the total energy per bale in the West dropping from over 100 kWh/bale, as per the presentation, to 74.9 kWh/bale as shown in Table 3a.

Acknowledgments

The authors would like to thank the ginners who returned the survey and hope that this activity provides them, as well as the cotton industry, with useful information to make informed management decisions.

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