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COTTON GIN OPERATING COSTS IN THE MIDSOUTH

1971/72 AND 1972/73

Economic Research Service • U.S. Department of Agriculture

COTTON GIN OPERATING COSTS IN THE MIDSOUTH, 1972/73 and 1973/74. By Joseph L. Ghetti and Zolon M. Looney. Economic Research Service, U.S. Department of Agriculture. Economic Research Service Report No. 589.

ABSTRACT

Gin operating costs in the Midsouth were analyzed for 1972/73 and 1973/74 on the basis of a sample of 58 plants representing about 70 percent of the total ginning capacity of the region. Average capacity utilization of the sample gins decreased from 64 percent in 1972/73 to 58 percent in 1973/74 or about 16 percent below the previous year. Average total cost per bale also increased--from $15.28 to $16.71. When adjustments were made for the differences in volumes ginned, the cost increase for 1973/74 was $0.43, compared with a $1.46 increase during the 1972/73 season. Total out-of-pocket cost rose $1.42 per bale over the previous year.

Key Words: Cotton ginning, capacity, utilization, rates, costs.

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COTTON GIN OPERATING COSTS IN THE MIDSOUTH--

1972/73 AND 1973/74

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INTRODUCTION

This is the ~~fourth~~ fifth annual report analyzing cotton gin operating costs in the Midsouth. 1/ Average costs and volumes ginned in the 1972/73 season are compared with costs and volumes in 1973/74. The study is similar to those conducted by the Economic Research Service (ERS) in several areas of Texas and California.

The Delta counties of Arkansas, Louisiana, Mississippi, and Missouri comprise the Midsouth area. Except for omission of a few counties in northwestern Louisiana, the Midsouth is the region defined as the Mississippi Delta in ERS cotton production cost studies. 2/ Gins were classified by rated capacity in bales per hour and stratified into four size groups. A random subsample was selected from each group in proportion to total capacity of the group. The sample is revised annually by additions and deletions to reflect changes in capacity of all gins in the area. ~~Forty-eight~~ Fifty-four plants, representing approximately ~~8~~ 7 percent of total ginning capacity of the region, comprise the sample.

FINDINGS

Volume Ginned

Number of bales ginned varied widely among plants within each size group (table 1). The overall range was ~~1,141~~ 441 to ~~19,527~~ 19,193 bales in 1973/74 and ~~904~~ 649 to ~~17,116~~ 19527 bales in 1972/73. In 1973/74, the smallest plants (group 1) averaged

1/ See appendix for a listing of other reports.
2/ Starbird, I. R. and Hines, F.K., Costs of Producing Upland Cotton in the United States, 1964. U.S. Dept. Agr., Agr. Econ. Rpt. No. 99, Sept. 1966.

Table 1--Rated hourly capacities, volumes ginned, and capacity utilization, by ranges and averages for sample gin plants and estimates for all gins, Midsouth region, 1972/73 and 1971/72

Gin group and season	Gins in--		Rated hourly capacity 1/			Annual volume ginned			Rate of capacity utilization 2/		
			Sample		Universe average	Sample		Universe average	Sample		Universe average
	Sample	Universe	Range	Average		Range	Average		Range	Average	
	- Number -					Bales			Percent		
1972/73:											
Group 1	8	224	5- 6	5.5	5.5	1,141- 4,825	2,725	--	25-104	64	--
Group 2	13	214	7- 8	7.2	7.3	1,770- 6,001	3,535	--	33-111	64	--
Group 3	13	168	9-15	11.8	12.0	1,333- 8,150	5,071	--	14-101	56	--
Group 4	14	113	16-42	21.0	19.9	6,281-19,527	11,083	--	49-113	73	--
Combined sample 3/	48	--	5-42	8.8	--	1,141-19,527	4,827	--	14-113	64	--
Universe 4/	--	719	--	--	9.8	--	--	4,403	--	--	58
1973/74:											
Group 1	10 8	247 212	5- 6	5.5	5.5	997- 3,829	2,264	28-139	22- 99	65 53	--
Group 2	13 14	235 207	7- 8	7.1	7.3	1,005- 6,269	3,692	~~44~~37	19-116	53 66	--
Group 3	12 13	141 170	9-15	~~12.0~~ 11.5	12.0	1,917-14,271	5,224	10-185	21-185	55 58	--
Group 4	13 15	89 121	16-36	~~20.0~~ 20.4	22.0	4,556-17,116	8,725	~~20~~-91	36- 85	64 58	--
Combined sample 3/	48 50	--	5-36	9.1	10.0	997-17,116	4,129	--	19-185	59	--
Universe 4/	--	712 710	--	--	9.0	--	--	3,766	--	--	54

-- = Not applicable.

1/ Based on observations in plants operating under normal conditions. Variations in group averages between seasons were due to adjustments in sample resulting from changes in plant population.

2/ Ratio of volume ginned to estimated total seasonal ginning capacity without seed cotton storage. Based on typical ginning season of 906 operating hours and a sustained seasonal capability estimated at 85 percent of rated hourly capacities.

3/ Combined sample and the group averages expanded to the universe.

4/ Based on number of gins operating in the study area and actual production during the respective ginning seasons.

2744
2,725 bales and the largest plants (group 4), 10 052 11,083 bales, compared with
2,264 and 8,725 bales in 1972/73.
2725 11,083

Based on ginning distributions reported by the Bureau of the Census, it is estimated that gins can operate up to 906 hours during a normal ginning season. 3/ Multiplying the product of 906 hours and rated hourly capacity by 85 percent efficiency gives the rated annual capacity for each size gin plant. 4/ Due to variations in local conditions, or unusual circumstances, individual plants can sometimes exceed these indicated annual peak volumes. Seven three sample plants exceeded their rated annual capacities in 1973/74, compared with four two in 1972/73. In 1972/73, average seasonal volume ranged from 53 56 percent of capacity for group 3 to 75 percent for group 4. The overall sample average capacity utilization was 68 percent. In 1972/73, the range was smaller--51 to 66 73 percent--with an overall average of 59 64 percent.

Average capacity of the 719 710 plants active in the area during 1973/74 was 9.8 10.0 bales per hour, up from 9.8 bales per hour for the 712 719 plants active in 1972/73. Total hourly capacity of all active plants in the area was approximately 7,048 6,646 bales in 1973/74 compared with about 6,408 7,086 the year before. Thus, total hourly capacity for all gins in the area increased 638 560 bales in 1 year. A similar increase in total hourly capacity occurred during the previous 2-year period.

Average Cost

Average book costs and replacement costs are shown for each size group and for all groups combined (tables 2 and 3). 5/ Book costs were taken directly from gin records, with only minor adjustments made to limit costs to those actually incurred in ginning. Replacement costs differ from book costs for only two items--depreciation and interest. Because of wide differences among gins in depreciation schedules used and interest actually paid, uniform rates for each were adopted. Depreciation was set at 7 percent of investment in buildings and equipment, based on replacement costs. Interest was allowed at 8 percent on half of this replacement cost and the total estimated land value.

Per bale costs for individual items varied widely within groups, mainly because of the broad range of volumes ginned. Average unit costs generally

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3/ Assuming no seed cotton storage, other than normal trailer storage, to extend the ginning season.

4/ Looney, Zolon M., and Wilmot, Charles A., Economic Models for Cotton Ginning. U.S. Dept. Agr., Agr. Econ. Rpt. No. 214, Oct. 1971.

5/ For definition of terms, allocation of costs, and cost adjustments, see appendix.

Table 2--Ginning costs per bale, sample groups 1-4 and weighted averages for gin universe, Midsouth region, 1972-73 1/

Cost item 2/	Group 1		Group 2		Group 3		Group 4		Weighted average 3/
	Range	Average	Range	Average	Range	Average	Range	Average	
	Dollars								
Management	1.21- 3.32	2.10	0.99- 4.62	2.51	1.07- 5.37	2.53	0.71- 3.31	1.23	1.98
Insurance	.20- 1.43	.62	.23- 2.02	.66	.19- 1.46	.62	.15- .73	.37	.54
Taxes	.19- 1.14	.42	.12- .76	.38	.10- .57	.30	.00- .71	.25	.32
Energy	1.95- 4.07	2.10	1.13- 2.66	1.82	.98- 3.14	1.99	1.08- 2.33	1.64	1.85
Labor	3.12- 6.00	4.23	2.63- 6.62	4.31	2.21- 7.53	3.95	1.74- 5.34	3.41	3.88
Bagging and ties	2.63- 4.18	3.73	2.77- 4.64	3.77	3.62- 4.26	3.90	3.17- 4.69	3.76	3.79
Repairs	1.39- 3.98	1.99	1.01- 5.57	2.76	1.51- 7.52	2.85	1.12- 3.79	2.33	2.49
Miscellaneous	.96- 2.06	1.41	.35- 4.90	1.11	.66- 4.09	1.48	.47- 1.82	1.01	1.22
Out-of-pocket subtotal 4/	14.42-22.02	16.60	14.30-23.18	17.33	13.32-26.17	17.62	11.06-17.25	14.01	16.07
Depreciation	.53- 3.83	1.48	.03- 6.98	2.85	.63- 9.11	2.62	1.62- 7.05	2.75	2.52
Interest	0.00- 3.30	.24	0.00- 7.94	1.41	0.00- 1.22	.55	0.00- 2.21	.56	.69
Total	14.96-29.15	18.32	15.18-29.62	21.58	15.10-35.20	20.79	13.44-22.37	17.32	19.28
Replacement depreciation 5/	3.74-15.77	6.49	3.21-10.88	5.47	2.47-19.95	4.96	2.33- 5.32	3.64	4.86
Replacement interest 5/	2.34- 9.85	4.06	1.99- 6.76	3.40	1.53-12.24	3.05	1.42- 3.24	2.21	3.00
Total replacement 6/	20.50-47.64	27.16	20.85-38.17	26.19	18.77-57.15	25.63	15.26-24.49	19.87	23.93

Individual items may not add to the total because of rounding.

1/ Group 1--rated capacity of 6 bales per hour or less; group 2--7 and 8 bales per hour; group 3--9 through 15 bales per hour; group 4--16 through 36 bales per hour. The universe includes all gins in the study area.

2/ Taken from gin records and subjected to uniform allocation procedures.

3/ Sample average across groups, weighted by each group's representative proportion of the total rated hourly ginning capacity in the study area gin universe.

4/ Sample gin cost excluding depreciation and interest.

5/ Depreciation at 7 percent, based on 1972 replacement costs (1970 cost plus 15 percent); interest at 8 percent on land value and on half the 1972 replacement cost.

6/ Out-of-pocket costs plus replacement depreciation and interest costs.

Table 3--Ginning costs per bale, sample groups 1-4 and weighted averages for gin universe, Midsouth region, 1971/72 1/

Cost item 2/	Group 1		Group 2		Group 3		Group 4		Weighted average 3/
	Range	Average	Range	Average	Range	Average	Range	Average	
	Dollars								
Management	1.02- 3.40	2.24	1.13- 4.87	2.09	1.19- 5.61	2.08	0.85- 4.02	1.35	1.92
Insurance	.26- 1.57	.68	.28- 1.90	.65	.18- 1.09	.50	.14- .80	.36	.54
Taxes	.14- .91	.36	.13- 1.40	.37	.09- .81	.26	.01- .69	.30	.32
Energy	.83- 3.31	1.86	1.11- 2.66	1.53	.70- 3.09	1.65	1.08- 2.38	1.74	1.68
Labor	3.19- 9.83	4.50	2.54- 6.12	3.73	2.16- 6.41	3.56	2.72- 5.32	3.58	3.79
Bagging and ties	2.28- 3.71	3.37	2.92- 3.89	3.46	3.13- 3.75	3.42	3.25- 3.70	3.46	3.43
Repairs	1.19- 8.04	3.10	1.41- 4.14	2.27	1.82- 9.87	3.03	1.55- 6.07	2.53	2.69
Miscellaneous	.95- 2.70	1.38	.40- 2.06	1.08	.46- 2.18	1.20	.47- 2.44	1.07	1.17
Out-of-pocket subtotal 4/	14.07-25.68	17.49	12.07-21.91	15.17	12.70-25.30	15.70	12.00-21.15	14.38	15.54
Depreciation	.67- 4.58	1.89	.21-11.28	1.95	.63- 6.58	2.39	2.21- 7.75	3.37	2.42
Interest	.00- 3.78	.49	.00- 2.62	.64	.00- 1.36	.54	.00- 2.30	.62	.58
Total	15.63-33.22	19.88	13.83-35.81	17.76	14.39-32.59	18.64	14.56-24.18	18.37	18.54
Replacement depreciation 5/	3.82-15.73	6.69	2.67-16.65	4.60	1.47-12.05	4.37	2.69- 6.33	4.03	4.79
Replacement interest 5/	2.43- 9.95	4.25	11.68-10.47	2.89	.92- 7.47	2.71	1.65- 3.90	2.47	2.99
Total replacement 6/	20.33-51.36	28.44	16.41-44.31	22.66	15.57-44.82	22.78	16.77-29.92	20.88	23.33

Individual items may not add to the total because of rounding.

1/ Group 1--rated capacity of 6 bales per hour or less; group 2--7 and 8 bales per hour; group 3--9 through 15 bales per hour; group 4--16 through 36 bales per hour. The universe includes all gins in the study area.

2/ Taken from gin records and subjected to uniform allocation procedures.

3/ Sample average across groups, weighted by each group's representative proportion of the total rated hourly ginning capacity in the study area gin universe.

4/ Sample gin costs excluding depreciation and interest.

5/ Depreciation at 7 percent, based on 1970 replacement costs; interest at 8 percent on land value and on half the 1970 replacement cost.

6/ Out-of-pocket costs plus replacement depreciation and interest costs.

tended to be lower as gin size and volume increased. However, even with greater volumes in 1972/73, costs were higher than in the previous year, except for groups 1 and 4 where costs were lower because of substantial increases in capacity utilization. In groups 2 and 3, where capacity utilization was relatively unchanged, costs averaged $3.82 and $2.15 per bale higher, respectively. In 1972/73, average sample gin costs per bale ranged from $17.32 for group 4 to $21.58 for group 2, and in 1971/72, from $17.76 to $19.88. These costs averaged $19.28 in 1972/73 and $18.54 in 1971/72.

Charging depreciation and interest on a replacement basis resulted in higher cost for all gins, although the increase was much more pronounced for smaller plants. Larger plants, because they tend to be newer, already have higher book depreciation and interest cost based on more recent installation cost. Total replacement cost ranged from $19.87 per bale for group 4 to $27.16 for group 2 in 1972-73. For all gins, the average was $23.93 or $4.65 over book cost. Comparable costs for 1970-71 were $23.93 and $4.79 per bale, respectively.

To illustrate the adverse effects of inadequate volumes on ginning costs, adjustments were made to 70 percent of capacity utilization and averages shown for each group (table 4). Spreading such costs as management and office labor, depreciation, interest, insurance, and taxes over more bales obviously reduces total ginning costs per bale markedly. Greater ginning volumes may also reduce per bale costs of such variable items as labor and energy. Ginning at the same relative volume results in lower costs as gin size is increased, reflecting economies of scale which exist among the sizes of gins studied. 6/

Even after adjustments were made for differences in volumes ginned, total cost per bale was $1.41 more in 1972-73 than in 1971-72, compared with a previous increase of $0.16 from 1970-71 to 1971-72 (table 4). Moreover, if the capacity utilization of all plants could have been raised from 58 to 70 percent, estimated weighted average total cost could have been reduced from $19.28 to $18.62--a saving of about $0.66 per bale.

6/ See footnote 4.

Table 4--Estimated gin costs per bale at 70-percent capacity utilization, sample groups 1-4 and weighted averages for universe, Midsouth region, 1972/73 and 1972/73 1/

Cost item 2/	1972/73 Group 1	Group 2	Group 3	Group 4	Weighted average 3/	1973-74 1972/73 Group 1	Group 2	Group 3	Group 4	Weighted average 3/
	Dollars									
Management	1.97	2.35	2.19	1.26	1.87	1.83 2.03	2.01 2.52	1.84 2.28	1.20 1.49	1.69 2.04
Insurance	.58	.62	.53	.38	.51	.55 .73	.62 .49	.44 .69	.32 .39	.48 .52
Taxes	.39	.34	.24	.27	.30	.27 .49	.35 .35	.22 .40	.25 .28	.27 .34
Energy	2.04	1.76	1.82	1.67	1.80	1.67 2.11	1.50 2.23	1.54 2.09	1.62 1.95	1.58 2.03
Labor	4.09	4.14	3.59	3.47	3.76	4.01 4.68	3.64 4.34	3.30 3.71	3.30 3.80	3.54 3.96
Bagging and ties	3.73	3.77	3.90	3.76	3.79	3.37 4.01	3.46 3.70	3.42 3.42	3.46 3.46	3.43 3.66
Repairs	1.93	2.66	2.63	2.37	2.43	2.77 2.58	2.22 3.76	2.84 3.85	2.37 3.05	2.54 3.25
Miscellaneous	1.39	1.10	1.43	1.02	1.20	1.31 1.29	1.08 1.57	1.16 1.78	1.04 1.33	1.14 1.47
Out-of-pocket subtotal 4/	16.11	16.75	16.33	14.20	15.65	15.80 17.96	14.89 18.98	14.76 18.83	13.56 15.76	14.67 17.19
Depreciation	1.36	2.59	2.10	2.89	2.33	1.45 1.59	1.84 2.97	1.99 3.10	2.78 3.41	2.04 2.75
Interest	.22	1.28	.44	.58	.63	.38 .68	.61 1.06	.45 .93	.51 .82	.49 .84
Total	17.70	20.62	18.87	17.66	18.62	17.62 20.23	17.34 23.19	17.20 22.86	16.85 19.98	17.21 20.78
Replacement depreciation 5/	5.97	4.97	3.97	3.82	4.49	5.11 5.97	4.35 5.06	3.63 5.09	3.32 3.81	4.06 4.47
Replacement interest 5/	3.74	3.09	2.44	2.32	2.77	3.25 3.74	2.73 3.11	2.25 3.13	2.04 2.31	2.53 2.76
Total replacement 6/	25.82	24.80	22.74	20.34	22.91	24.16 27.66	21.98 27.08	20.64 27.05	18.92 21.87	21.26 24.42
	Number									
Bales	2,965	3,889	6,344	10,573	5,284	2,964 2965	3,897 3950	6,288 4912	10,573 10596	4,840 5402

Individual items may not add to the total because of rounding. 1/ Group 1--rated capacity of 6 bales per hour or less; group 2--7 and 8 bales per hour; group 3--9 through 15 bales per hour; group 4--16 through 36 bales per hour. The universe includes all gins in the study area. 2/ Taken from gin records subjected to uniform allocation procedures. 3/ Sample average across groups, weighted by each group's representative proportion of the total rated hourly ginning capacity in the study area gin universe. 4/ Sample gin cost excluding depreciation and interest. 5/ Depreciation at 7 percent, based on 1970 replacement costs for 1971-72. For 1972-73, replacement costs were increased by 15 percent to reflect current conditions; interest at 8 percent on land value and on half the replacement cost. 6/ Out-of-pocket costs plus replacement depreciation and interest costs.

APPENDIX

Gins vary widely by type of organization, ownership structure, accounting procedures, and in many other ways. In analyzing costs reported by sample gins, uniform allocation procedures were employed to compensate for some of these differences. Costs of hauling cottonseed and lint, such as truckdrivers' wages, truck depreciation, insurance, road-use taxes, and associated truck-operating costs, were excluded.

Cost Allocations

Management: Where applicable, includes salaries, bonuses, commissions, expense allowance, house rent, and personal insurance policies for owners and managers, bookkeeping and other office salaries and home office cost (line companies); and social security taxes, workmen's compensation insurance, and any other insurance on management and office personnel.

Depreciation: Allowances for depreciation exactly as carried on gin records. (See Replacement Costs below.)

Interest: Interest exactly as carried on gin records. (See Replacement Costs below.)

Insurance: All forms of insurance on gin buildings, equipment, housing furnished management and labor, cotton products, and automotive equipment (except large trucks and trailers).

Taxes: All taxes on real property only.

Energy: All utilities--electricity, gas, and water--used in ginning and directly related operations.

Labor: Gin wages, social security, workmen's compensation, and other insurance on gin labor borne by the gin and expenses related to any rental housing furnished labor. (Excludes gin repair labor; see Repairs below.)

Bagging and ties: Actual cost of bagging and ties purchased.

Repairs: Gin repair wages; social security, workmen's compensation, and other insurance on gin repair labor borne by the gin; and cost of repair materials and supplies.

Miscellaneous: Combined car and pickup, tractor, and other automotive expense; telephone and telegraph; advertising and promotion; legal and audit, dues (except National Cotton Council dues), memberships, and subscriptions; annual meetings and director's fees and expenses; conventions and travel expenses; donations and contributions; cotton losses from fire; sampling, compressing, and related charges; gin supplies; and any other costs not included elsewhere.

Costing Methods

Sample gin costs: Gin costs which have been subjected to the above allocations are identified in this report as sample gin costs.

Out-of-pocket costs: Sample gin costs from which depreciation and interest have been excluded.

Replacement costs: Out-of-pocket costs plus depreciation at 7 percent computed on 1973 replacement values of gin plants and interest at 8 percent on land value and on half the 1972-73 replacement cost of machinery, equipment, and buildings. ~~for 1972-73. For 1972-73, these values were increased by 15 percent to compensate for the general rise in price levels.~~

Cost Adjustments

Estimates of ginning costs at other than existing levels of capacity utilization were based on relationships assumed in the synthetic development of a series of model gins. 7/

Weighting

In computing weighted averages, the simple weighted average cost per bale for each group was further weighted by its representative proportion of total rated hourly ginning capacity in the area. This was done to reflect more accurately the cost of ginning an "average" bale of cotton in the Midsouth.

Related Reports

1. Looney, Zolon M., and Shaw, Dale L., Cotton Gin Operating Costs in the Midsouth, 1968-69 and 1969-70, U.S. Dept. Agr., Econ. Res. Serv., Mktg. Res. Rpt. No. 942, Dec. 1971.
2. Looney, Zolon M., Holder, Jr. Shelby H., and Ghetti, Joseph L. Cotton Gin Operating Costs in the Midsouth--1969-70 and 1970-71 Seasons, U.S. Dept. Agr., Econ. Res. Serv., Mktg. Res. Rpt. No. 964, June 1972.
3. Looney, Zolon M., Ghetti, Joseph L., and Holder, Jr. Shelby H., Cotton Gin Operating Costs in the Midsouth, 1970-71 and 1972-73 Seasons. U.S. Dept. Agr., Econ. Res. Serv., Mktg. Res. Rpt. No. 1007, Sept. 1973.
4. Ghetti, Joseph L, Looney, Zolon M., Cotton Gin Operating Costs in the Mid-South 1971-72 And 1972-73, U.S. Dept of Agr. Econ. Res. Service, Mktg Res Rpt no 585 Dec, 1974

7/ See footnote 4.

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