

AGRICULTURAL ECONOMIC REPORT NO. 301

**COTTON GIN
OPERATING COSTS
IN THE MIDSOUTH
1972/73 and 1973/74**

ECONOMIC RESEARCH SERVICE
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COTTON GIN OPERATING COSTS IN THE MIDSOUTH, 1972/73 and 1973/74. By Joseph L. Ghatti. Economic Research Service, U.S. Department of Agriculture. Agricultural Economic Report No. 301.

ABSTRACT

Cotton gin operating costs in the Midsouth were analyzed for 1972/73 and 1973/74 on the basis of a sample of 48 and 50 plants, respectively, representing about 7 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. Average total cost per bale increased 16 percent, from \$19.28 to \$22.45. When adjustments were made for the differences in volumes ginned, the cost increase for 1973/74 was \$0.43, compared with a \$1.41 increase during the 1972/73 season. Total out-of-pocket cost for 1973/74 rose \$1.42 per bale over the previous year.,

Keywords: Cotton ginning, capacity, utilization, rates, costs, South.

COTTON GIN OPERATING COSTS IN THE MIDSOUTH

1972/73 and 1973/74

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INTRODUCTION

This is the fifth annual report analyzing cotton gin operating costs in the Midsouth. 1/ Average costs and volumes ginned are compared for the 1972/73 and 1973/74 seasons. Studies are 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. 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 the number and capacity of all gins in the area. The sample consisted of 48 plants in 1972/73 and 50 plants in 1973/74, and represented about 7 percent of total ginning capacity of the region.

FINDINGS

Volume Ginned

Number of bales ginned varied widely among plants within each size group (table 1). The overall range was 647 to 24,843 bales in 1973/74 and 1,141 to 19,527 bales in 1972/73. In 1973/74, the smallest plants (group 1) averaged 2,744 bales and the largest plants (group 4), 10,052 bales, compared with 2,725 and 11,083 bales in 1972/73.

1/ See appendix for a listing of other reports.

2/ Starbird, I.R., and Hines, F.K., Cost of Producing Upland Cotton in the United States, 1964, U.S. Dept. Agr., Econ. Res. Service, Agr. Econ. Rpt. No. 99, Sept. 1966.

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. Three sample plants exceeded their rated annual capacities in 1973/74, compared with seven in 1972/73. In 1973/74, average seasonal volumes ranged from 53 percent of capacity for group 2 to 65 percent for group 1, and averaged 58 percent overall. In 1972/73, average capacity utilization ranged from 73 percent, with an overall average of 64 percent.

Average capacity of the 710 plants active in the area during 1973/74 was 10.0 bales per hour, up from 9.8 bales per hour for the 719 plants active in 1972/73. Total hourly capacity of all active plants in the area was approximately 7,116 bales in 1973/74, compared with about 7,046 the year before. Thus, total hourly capacity for all gins in the area increased 70 bales in 1 year though the number of gins decreased. A similar increase in total hourly capacity occurred during the previous 2-year period.

Average Cost

Average book 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 only for 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 tended to be lower as gin size and volume increased. However, costs in 1973/74 were higher than in the previous year in all groups because of substantial increases in input costs and lower capacity utilization. Average increases from 1972/73 to 1973/74 ranged from \$2.07 per bale in group 3 to \$4.92 in group 2. In 1973/74 average sample gin costs per bale ranged from \$20.82 for group 4 to \$26.50 for group 2, and in 1972/73 from \$17.32 to \$21.58. These costs averaged \$22.45 in 1973/74 and \$19.28 in 1972/73, an increase of \$3.17 per bale.

^{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., Econ. Res. Serv., Agr. Econ. Rpt. No. 214, Oct. 1971.

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

Table 1--Rated hourly capacities, volumes ginned, and capacity utilization, by ranges and averages for sample gin plants and estimates for all gins, Midsouth, 1972/73 and 1973/74

Gin group and season	Gins in--			Rated hourly capacity 1/			Annual volume ginned			Rate of capacity utilization 2/		
	: Sample :	: Uni-verse :	: Range :	: Sample :	: Uni-verse :	: Range :	: Sample :	: Uni-verse :	: Range :	: Sample :	: Uni-verse :	: Range :
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.....	8	212	5-6	5.5	5.5	1,274-5,335	2,744	--	28-139	65	--	--
Group 2.....	14	207	7-8	7.1	7.2	647-7,373	2,918	--	11-137	53	--	--
Group 3.....	13	170	9-15	11.5	12.0	1,040-14,238	4,912	--	10-185	55	--	--
Group 4.....	15	121	16-36	20.4	20.0	5,145-24,843	10,052	--	25-91	64	--	--
Combined sample 3/.....	50	--	5-36	10.0	--	647-24,843	4,343	--	10-185	58	--	--
Universe 4/.....	--	710	--	10.0	--	--	3,506	--	--	--	--	46

-- = 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.

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

Cost item <u>2/</u>	Group 1		Group 2		Group 3		Group 4		Weighted average <u>3/</u>
	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 <u>4/</u>	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 <u>5/</u>	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 <u>5/</u>	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 <u>6/</u>	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.

Standardizing depreciation on current replacement costs and standardizing on interest charge to all gins at current rates 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 \$22.89 per bale for group 4 to \$31.75 for group 2 in 1973/74. For all gins, the average was \$26.75, or \$4.30 over book cost. Comparable costs for 1972/73 were \$23.93 and \$4.65 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 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 averaged \$20.66 in 1973/74 compared with \$18.62 in 1972/73 (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 \$22.45 to \$20.66--a savings of \$1.79 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, 1972/73 and 1973/74 1/

Cost item <u>2/</u>	1972/73				1973/74					
	Group : 1	Group : 2	Group : 3	Group : 4	Weighted : average : <u>3/</u>	Group : 1	Group : 2	Group : 3	Group : 4	Weighted : average : <u>3/</u>
Management.....	1.97	2.35	2.19	1.26	1.87	2.03	2.52	2.88	1.49	2.06
Insurance.....	.58	.62	.53	.38	.51	.73	.46	.69	.39	.52
Taxes.....	.39	.34	.24	.27	.30	.49	.35	.40	.28	.34
Energy.....	2.04	1.76	1.82	1.67	1.80	2.11	2.23	2.09	1.95	2.04
Labor.....	4.09	4.14	3.59	3.47	3.76	4.68	4.34	3.71	3.80	3.88
Bagging and ties.....	3.73	3.77	3.90	3.76	3.79	4.06	3.70	3.42	3.46	3.60
Repairs.....	1.93	2.66	2.63	2.37	2.43	2.58	3.76	3.85	3.05	3.08
Miscellaneous.....	1.39	1.10	1.43	1.02	1.20	1.28	1.57	1.78	1.33	1.55
Out-of-pocket subtotal <u>4/</u>	16.11	16.75	16.33	14.20	15.65	17.96	18.98	18.83	15.76	17.07
Depreciation.....	1.36	2.59	2.10	2.89	2.33	1.59	2.97	3.10	3.41	2.75
Interest.....	.22	1.28	.44	.58	.63	.68	1.11	.93	.82	.84
Total.....	17.70	20.62	18.87	17.66	18.62	20.23	23.10	22.86	19.98	20.66
Replacement depreciation <u>5/</u>	5.97	4.97	3.97	3.82	4.49	5.97	5.00	5.09	3.81	4.47
Replacement interest <u>5/</u>	3.74	3.09	2.44	2.32	2.77	3.74	3.11	3.13	2.31	2.76
Total replacement <u>6/</u>	25.82	24.80	22.74	20.34	22.91	27.66	27.08	27.05	21.87	24.30
Bales.....	2,965	3,889	6,344	10,573	5,284	2,964	3,850	4,912	10,995	5,402

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 1972 replacement costs for 1971/72; 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 meeting and director's fees and expenses; conventions and travel expense; 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 1972/73 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.

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. 1/

Weighting

In computing weighted averages, the sample weighted average cost per bale for each group was further weighted by its representative proportion of total rated hourly ginning capacity in the area, to reflect more accurately the cost of ginning 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.
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3. Looney, Zolon M., Ghetti, Joseph L., and Holder, Jr., Shelby H., Cotton Gin Operating Costs in the Midsouth, 1970-71 and 1971-72 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 Midsouth, 1971-72 and 1972-73, U.S. Dept. Agr., Econ. Res. Serv., Mktg. Res. Rpt. No. 589, Dec. 1974.

1/ See footnote 4.

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