

Cotton Gin Operating Costs  
In The Midsouth -  
1969-70 and 1970-71 Seasons

## ABSTRACT

Gin operating costs in the Midsouth were analyzed for the 1970-71 and 1969-70 seasons on the basis of a sample of 48 plants representing over 8 percent of the total ginning capacity of the region. Although capacity utilization increased to 56 percent on the average in 1970-71 from 50 percent in 1969-70, average total cost per bale also increased--from \$18.14 to \$18.51. All overhead costs were down slightly in 1970-71; however, variable costs, except for energy, rose as a result of general price increases and inclement weather resulting in an abnormally long ginning season.

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

## ACKNOWLEDGMENTS

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COTTON GIN OPERATING COSTS IN THE MIDSOUTH--  
1969-70 AND 1970-71 SEASONS

by

Zolon M. Looney, Shelby H. Holder, Jr., and  
Joseph L. Ghetti  
Agricultural Economists, Marketing Economics Division

INTRODUCTION

This is the second annual report analyzing cotton gin operating costs in the Midsouth. Average costs and volumes ginned in the 1970-71 season are compared with costs and volumes for 1969-70. The study is similar to one on cotton ginning costs in West Texas which the Department of Agriculture has published annually since the 1965-66 season.

The Delta counties of Arkansas, Louisiana, Mississippi, and Missouri comprise the Midsouth area. Except for the omission of a few counties in northwestern Louisiana, the Midsouth is the region defined as the Mississippi Delta by the Farm Production Economics Division, Economic Research Service, USDA, in its cotton production studies. <sup>1/</sup> Gins in this area 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 the total capacity of the group. Forty-eight plants, representing over 8 percent of the total ginning capacity of the region, comprised the sample.

FINDINGS

Volume Ginned

Number of bales ginned varied widely among gins within each size group (table 1). The overall range was 916 to 18,577 bales in the 1970-71 season and 866 to 12,484 bales in the 1969-70 season. The smallest plants (group 1) averaged 2,264 bales in 1970-71, compared with 1,986 bales in 1969-70. The largest plants (group 4) averaged 8,726 bales in 1970-71 and 7,315 bales in 1969-70.

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

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<sup>1/</sup> 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, Delta counties of Arkansas, Louisiana, Mississippi, and Missouri, 1970-71 and 1969-70 seasons

Gin group and season	Gins in--			Rated hourly capacity 1/			Annual volume ginned			Rate of capacity utilization 2/		
	Sample	Uni- verse	Number	Sample		Average	Sample		Average	Sample		Average
				Range	Uni- verse		Range	Uni- verse		Range	Uni- verse	
<b>1970-71:</b>												
Group 1.....	12	266	--	5-6	5.5	5.5	916-4,287	2,264	--	20-111	53	--
Group 2.....	15	242	--	7-8	7.2	7.3	1,385-6,011	3,395	--	22-112	61	--
Group 3.....	12	144	--	9-15	11.8	11.5	2,540-11,833	4,886	--	28-154	54	--
Group 4.....	9	71	--	16-36	21.0	18.9	2,728-18,577	8,726	--	22-67	54	--
Combined sample.....	48	--	--	5-36	10.5	--	916-18,577	4,484	--	20-154	55	--
Universe 3/.....	--	723	--	--	--	8.6	--	--	3,258	--	--	49
<b>1969-70:</b>												
Group 1.....	12	299	--	5-6	5.6	5.4	866-3,265	1,986	--	19-85	46	--
Group 2.....	15	260	--	7-8	7.2	7.3	1,491-5,454	3,222	--	24-101	58	--
Group 3.....	13	136	--	9-15	12.1	11.5	2,906-10,040	4,563	--	27-130	49	--
Group 4.....	8	50	--	16-36	21.6	18.9	3,460-12,484	7,315	--	28-81	44	--
Combined sample.....	48	--	--	5-36	10.5	--	866-12,484	3,958	--	19-130	49	--
Universe 4/.....	--	745	--	--	--	8.1	--	--	2,945	--	--	47

-- = 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/ Based on number of gins operating in the study area and actual production during the 1970-71 ginning season.

4/ Based on number of gins operating in the study area during the 1968-69 ginning season and actual production in the area during the 1969-70 season.

season. <sup>2/</sup> Multiplying the product of 906 hours and rated hourly capacity by 85-percent efficiency gives the rated annual capacity for each size gin plant. <sup>3/</sup> Due to variations in local conditions, or unusual circumstances, individual plants can sometimes exceed these indicated annual peak volumes. Three plants exceeded their rated annual capacities in 1970-71, compared with two in 1969-70. In 1970-71, the average seasonal volume ranged from 53 percent of capacity for group 1 to 61 percent for group 2. The overall sample average capacity utilization was 55 percent. In 1969-70, the range was lowered--44 to 58 percent--with an overall average of 49 percent.

The universe average hourly capacity and volume ginned for the 1969-70 crop are based on the 745 gins operating in the area during the 1968-69 season, since data for 1969-70 were not available. Average capacity of these plants was 8.1 bales per hour for a total combined hourly capacity of 6,025 bales. By the 1970-71 season, the number of gins in the area had decreased to 723, but the average capacity had increased to 8.6 bales per hour, and total combined hourly capacity had increased to 6,210 bales. Thus, total hourly capacity for all gins in the area had increased nearly 200 bales per hour, although the number of plants had declined by 22 over the 2-year period.

#### Average Cost

Average book costs and replacement costs are shown in tables 2 and 3 for each size group and for all groups combined.<sup>4/</sup> 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 in only two items--depreciation and interest. To compensate for 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 1970 replacement costs. Interest was allowed at 7 percent in 1969-70 and 8 percent in 1970-71 on one-half of this replacement cost and on the estimated land value.

Per bale costs for individual items vary widely within groups, mainly because of the broad range of volumes ginned. Costs tend to average lower with increases in gin size as well as in ginning volumes. In 1970-71, average sample gin costs per bale ranged downward from \$19.90 for group 1 to \$17.55 for group 2. The apparent discrepancies in groups 3 and 4 (somewhat higher costs than for group 2) were due to gins in group 2 having an appreciably higher capacity utilization than those in the two larger size groups. Even with higher volumes in 1970-71, per bale ginning costs exceeded those of 1969-70. Of the operating costs, labor, bagging and ties, repairs, and miscellaneous items were all up from the previous year. Inclement weather in the area during October, resulting in an abnormally long ginning season, may have caused some of these increases.

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<sup>2/</sup> Assuming no seed cotton storage, other than normal trailer storage, extends the ginning season.

<sup>3/</sup> Looney, Zolon M., and Wilmot, Charles A. Economic Models for Cotton Ginning. U.S. Dept. Agr., Agr. Econ. Rpt. No. 214, Oct. 1971.

<sup>4/</sup> For definitions of terms, allocation of costs, and cost adjustments, see the appendix.

Table 2.--Sample ginning costs per bale, groups 1-4 and weighted averages for gin universe, Delta counties of Arkansas, Louisiana, Mississippi, and Missouri, 1970-71 season <sup>1/</sup>

Cost item <sup>2/</sup>	Group 1		Group 2		Group 3		Group 4		Weighted average <sup>3/</sup>
	Range	Average	Range	Average	Range	Average	Range	Average	
	Dollars								
Management.....	0.53-6.27	2.47	0.71-5.30	2.12	1.14-3.85	2.03	0.84-3.04	1.19	1.98
Insurance.....	.14-1.37	.60	.30-1.81	.66	.22-1.21	.51	.16-.86	.39	.55
Taxes.....	.14-1.90	.49	.14-1.18	.38	.12-.74	.29	.01-.53	.27	.36
Energy.....	.61-3.25	1.88	.66-2.58	1.38	.83-2.58	1.56	1.34-2.61	1.79	1.62
Labor.....	2.60-8.59	4.97	1.70-5.92	3.86	1.87-9.19	3.65	1.39-6.24	3.33	3.94
Bagging and ties.....	2.67-3.64	3.04	2.01-4.72	3.10	3.09-4.77	3.29	3.03-3.53	3.19	3.15
Repairs.....	1.12-4.04	2.28	.45-5.05	2.15	1.50-6.17	2.94	1.52-5.15	2.53	2.46
Miscellaneous.....	.41-4.48	1.62	.20-1.76	1.05	.29-3.23	1.29	.39-3.31	1.04	1.24
Out-of-pocket subtotal <sup>4/</sup> .....	9.67-27.25	17.35	7.68-22.96	14.70	11.91-24.59	15.56	9.79-21.72	13.73	15.31
Depreciation.....	.66-3.66	2.05	.41-10.06	2.19	1.35-5.31	2.77	2.26-6.30	3.46	2.57
Interest.....	0.00-3.99	.49	0.00-2.86	.66	0.00-2.18	.63	0.00-2.79	.69	.62
Total.....	12.40-33.10	19.90	12.27-35.88	17.55	14.84-30.51	18.97	12.80-26.01	17.88	18.51
Replacement depreciation <sup>5/</sup> .....	3.41-17.12	6.70	2.78-12.84	4.99	1.77-9.09	4.71	3.65-10.55	4.32	5.16
Replacement interest <sup>5/</sup> .....	2.17-10.83	4.25	1.75-8.03	3.13	1.11-5.64	2.92	2.21-6.50	2.65	3.23
Total replacement <sup>6/</sup> .....	15.26-55.20	28.30	13.88-43.83	22.82	15.70-39.32	23.19	15.81-38.76	20.70	23.71

<sup>1/</sup> 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.

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

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

<sup>4/</sup> Sample gin cost excluding depreciation and interest.

<sup>5/</sup> Depreciation at 7 percent, based on 1970 replacement costs; interest at 8 percent on land value and 1/2 1970 replacement cost.

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

Note: The sum of individual items may not equal the total because of rounding.

Table 3.--Sample ginning costs per bale, groups 1-4 and weighted averages for gin universe, Delta counties of Arkansas, Louisiana, Mississippi, and Missouri, 1969-70 season <sup>1/</sup>

Cost item <sup>2/</sup>	Group 1		Group 2		Group 3		Group 4		Weighted average <sup>3/</sup>
	Range	Average	Range	Average	Range	Average	Range	Average	
	Dollars								
Management.....	1.01- 6.44	2.92	1.02- 2.89	2.08	1.26- 6.44	2.21	1.00- 2.29	1.39	2.23
Insurance.....	.40- 1.64	.79	.33- 1.30	.68	.27- .86	.50	.28- .66	.41	.63
Taxes.....	.18- 1.25	.53	.09- .99	.41	.10- .61	.30	.03- .66	.30	.40
Energy.....	.90- 4.23	2.04	.52- 3.18	1.44	.98- 2.52	1.66	1.17- 2.52	1.72	1.68
Labor.....	3.39- 9.86	4.10	1.91- 5.18	3.52	1.75- 5.61	3.25	1.79- 4.33	3.24	3.56
Bagging and ties.....	2.36- 3.13	2.84	2.06- 3.68	3.01	2.86- 3.22	3.03	2.90- 4.10	3.14	2.99
Repairs.....	.65- 9.06	2.50	.75- 3.53	1.63	1.36- 3.16	2.08	.66- 4.53	2.14	2.03
Miscellaneous.....	.55- 5.41	1.76	.21- 1.79	1.07	.44- 1.50	1.01	.18- 1.44	.49	1.15
Out-of-pocket subtotal <sup>4/</sup> .....	12.19-37.05	17.48	11.27-16.95	13.85	10.70-20.41	14.03	10.19-16.83	12.83	14.66
Depreciation.....	1.06- 4.64	2.29	.16- 6.81	2.25	1.09- 7.52	3.16	2.66- 8.16	4.36	2.78
Interest.....	0.00- 3.23	.44	0.00- 3.25	.78	0.00- 2.60	.56	0.00- 3.91	1.26	.71
Total.....	14.54-41.23	20.21	11.70-23.45	16.88	12.82-25.80	17.75	15.53-23.60	18.45	18.14
Replacement depreciation <sup>5/</sup> .....	4.48-18.10	7.67	3.07-11.93	5.26	2.09- 8.67	5.12	2.81- 8.32	5.31	5.82
Replacement interest <sup>5/</sup> .....	2.50-10.02	4.26	1.69- 6.53	2.89	1.14- 4.69	2.78	1.51- 4.48	2.84	3.20
Total replacement <sup>6/</sup> .....	20.44-65.17	29.42	17.58-35.40	21.99	13.93-30.58	21.93	17.30-29.27	20.99	23.68

<sup>1/</sup> 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.

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

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

<sup>4/</sup> Sample gin cost excluding depreciation and interest.

<sup>5/</sup> Depreciation at 7 percent, based on 1970 replacement costs; interest at 7 percent on land value and 1/2 1970 replacement cost.

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

Note: The sum of individual items may not equal the total because of rounding.

Charging depreciation and interest on a replacement basis results in higher costs for all gins, although the increase is much more pronounced for the smaller plants. Larger plants, because they tend to be newer, already have higher book depreciation and interest costs based on more recent installation costs.

To illustrate the adverse effects of inadequate volumes on ginning costs, each sample gin's costs were adjusted to 70 percent of capacity utilization and of 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 substantially. 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. 5/

Ginning costs are increasing; even after adjustments were made for differences in volumes ginned, the total cost per bale was \$1.28 more in 1970-71 than in 1969-70. When allowances were made for depreciation and interest, based on 1970 replacement costs of buildings and equipment, this difference was \$1.46 per bale.

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5/ See footnote 3.



Table 4.--Estimated sample gin costs per bale at 70-percent capacity utilization, groups 1-4 and weighted averages for universe, Delta counties of Arkansas, Louisiana, Mississippi, and Missouri, 1970-71 and 1969-70 seasons 1/

Cost item 2/	1970-71				1969-70				: Weighted : average : 3/	: Group : 1 :	: Group : 2 :	: Group : 3 :	: Group : 4 :	: Weighted : average : 4/
	: Group : 1 :	: Group : 2 :	: Group : 3 :	: Group : 4 :	: Weighted : average :	: Group : 1 :	: Group : 2 :	: Group : 3 :						
Management.....	1.99	1.87	1.69	1.03	1.67	2.05	1.77	1.71	1.71	1.04	1.72			
Insurance.....	.50	.60	.43	.33	.47	.58	.59	.40	.40	.32	.49			
Taxes.....	.37	.33	.22	.21	.29	.35	.34	.21	.21	.19	.29			
Energy.....	1.74	1.31	1.45	1.64	1.52	1.81	1.33	1.47	1.47	1.47	1.52			
Labor.....	4.41	3.61	3.16	2.98	3.54	3.39	3.14	2.71	2.71	2.47	2.99			
Bagging and ties.....	3.04	3.10	3.29	3.19	3.15	2.84	3.04	3.03	3.03	3.15	3.00			
Repairs.....	2.33	2.27	2.98	2.58	2.54	2.80	1.60	2.10	2.10	2.01	2.12			
Miscellaneous.....	1.81	1.04	1.38	1.11	1.33	1.74	1.03	1.01	1.01	.53	1.14			
Out-of-pocket subtotal 4/.....	16.19	14.12	14.60	13.07	14.50	15.55	12.84	12.64	12.64	11.19	13.26			
Depreciation.....	1.57	1.92	2.12	2.67	2.05	1.51	1.87	2.21	2.21	2.74	2.00			
Interest.....	.38	.58	.49	.53	.50	.29	.65	.39	.39	.79	.51			
Total.....	18.14	16.61	17.20	16.27	17.05	17.36	15.36	15.25	15.25	14.72	15.77			
Replacement depreciation 5/.....	5.11	4.37	3.61	3.33	4.12	5.07	4.37	3.58	3.58	3.33	4.18			
Replacement interest 5/.....	3.25	2.74	2.24	2.04	2.58	2.81	2.40	1.95	1.95	1.79	2.30			
Total replacement 6/.....	24.55	21.23	20.44	18.44	21.20	23.43	19.61	18.17	18.17	16.31	19.74			
Bales.....	2,964	3,881	6,378	11,319	4,630	3,009	3,881	6,509	6,509	11,656	4,359			

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 1970 replacement cost. Interest at 7 percent on land value and 1/2 1970 replacement cost for 1969-70 and at 8 percent for 1970-71. 6/ Out-of-pocket costs plus replacement depreciation and interest costs.

Note: The sum of individual items may not equal the total because of rounding.

## APPENDIX

Gins vary widely by type of organization, ownership structure, and 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. Cost of hauling cottonseed and lint, such as truck drivers' 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); 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.

Interest: Interest exactly as carried on gin records.

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 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 directors' 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.

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 of 7 percent computed on 1970 replacement values on gin plants and interest at 7 percent of one-half the replacement value and 7 percent of land value for 1969-70. Interest was estimated at 8 percent for 1970-71.

#### 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. 6/

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6/ See footnote 3.

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