

Cotton Gin Operating Costs
In The Midsouth
1968-69 and 1969-70

ABSTRACT

Gin operating costs in the Midsouth were analyzed for 1968-69 and 1969-70 on the basis of a sample of 48 plants representing over 8 percent of the total ginning capacity of the region. Capacity utilization rates and ginning volumes were down in 1969-70, compared with 1968-69, while per bale operating costs were generally higher. Average capacity utilization declined from 54 percent in 1968-69 to 49 percent in 1969-70, while average total cost per bale increased from \$16.33 to \$18.05. All overhead costs were up in 1969-70, due mainly to reduced volumes; variable costs rose as a result of general price increases.

Key Words: Cotton ginning, Capacity, Utilization, Rates, Costs.

COTTON GIN OPERATING COSTS IN THE MIDSOUTH
1968-69 and 1969-70

by

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INTRODUCTION

This is the first of an anticipated series of annual reports analyzing cotton gin operating costs in the Midsouth. It is similar to the yearly study of cotton ginning costs in West Texas which the U.S. Department of Agriculture has published since the 1965-66 season. Copies of gin records are received annually by mail and analyzed for use in preparing these reports.

The Delta counties of Arkansas, Louisiana, Mississippi, and Missouri comprise the Midsouth area. With the exception 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. ^{1/} 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. (One gin included in the 1969-70 season did not operate in 1968.)

FINDINGS

Volume Ginned

Number of bales ginned varied widely among gins within each size group (table 1). The overall range was 530 to 16,658 bales in 1968-69 and 866 to 12,484 bales in 1969-70. The smallest plants (Group 1) averaged 1,802 bales in 1968-69, compared with 1,986 bales in 1969-70. The largest plants (Group 4) averaged 9,237 bales in 1968-69 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 the normal ginning season. ^{2/} Multiplying 906 hours by rated hourly capacity by 85-percent efficiency

^{1/} Starbird, I. R., and Hines, F. K. Cost of Producing Upland Cotton in the United States, 1964. U.S. Dept. Agr., Agr. Econ. Rpt. No. 99, Sept. 1966.

^{2/} Assumes no seed cotton storage, other than normal trailer storage, to extend the ginning season.

Table 1.--Rated hourly capacities, volumes ginned, and capacity utilization, by ranges and averages, sample gin plants, Groups 1-4 and all groups combined, Delta counties of Arkansas, Louisiana, Mississippi, and Missouri, 1968-69 and 1969-70 seasons

| Gin size and season | Number in sample | Rated hourly capacity 1/ | | Bales | Annual volume ginned | | Rate of capacity utilization 2/ | | |
|---------------------|------------------|--------------------------|---------|---------|----------------------|---------|---------------------------------|---------|--|
| | | Range | Average | | Range | Average | Range | Average | |
| <u>1968-69:</u> | | | | | | | | | |
| Group 1..... | 11 | 5 - 6 | 5.6 | 530 - | 3,218 | 1,802 | 11 - 84 | 42 | |
| Group 2..... | 15 | 7 - 8 | 7.2 | 1,355 - | 5,756 | 3,560 | 22 - 99 | 64 | |
| Group 3..... | 13 | 9 - 15 | 12.1 | 2,089 - | 10,635 | 4,718 | 23 - 138 | 51 | |
| Group 4..... | 8 | 16 - 36 | 21.6 | 3,068 - | 16,658 | 9,237 | 25 - 85 | 55 | |
| Combined..... | 47 | 5 - 36 | 10.6 | 530 - | 16,658 | 4,435 | 11 - 138 | 54 | |
| <u>1969-70:</u> | | | | | | | | | |
| Group 1..... | 12 | 5 - 6 | 5.6 | 866 - | 3,265 | 1,986 | 19 - 85 | 46 | |
| Group 2..... | 15 | 7 - 8 | 7.2 | 1,491 - | 5,454 | 3,222 | 24 - 101 | 58 | |
| Group 3..... | 13 | 9 - 15 | 12.1 | 2,906 - | 10,040 | 4,563 | 27 - 130 | 49 | |
| Group 4..... | 8 | 16 - 36 | 21.6 | 3,460 - | 12,484 | 7,315 | 28 - 81 | 44 | |
| Combined..... | 48 | 5 - 36 | 10.5 | 866 - | 12,484 | 3,958 | 19 - 130 | 49 | |

1/ Based on observations and manufacturers' ratings.

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 set at 85 percent of manufacturers' ratings.

gives the rated annual capacity for each size gin plant. ^{3/} Due to variations in local conditions or unusual circumstances, individual plants can sometimes exceed these indicated annual peak volumes. In 1968-69, only one sample plant exceeded its rated annual capacity; and in 1969-70, only two did so. In 1968-69, the average seasonal volume ranged from 42 percent of capacity for Group 1 to 64 percent for Group 2. The overall average was 54 percent. In 1969, the range was narrower--46 to 58 percent--with an overall average of 49 percent.

Average Cost

Average book costs and replacement costs are shown for each size group and for all groups combined (tables 2 and 3). ^{4/} Book costs were taken directly from gin records, with only minor adjustments to limit costs to those actually incurred in ginning. Replacement costs differ from book costs in only two cost 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 prices. Interest was allowed at 7 percent of one-half of this investment, plus 7 percent of 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 also with increases in gin size as well as in ginning volumes. In 1968-69, average sample gin costs per bale ranged downward from \$19.72 for Group 1 to \$15.57 for Group 4. The apparent discrepancy in Group 3 (somewhat higher costs than for Group 2) was due to gins in Group 2 having an appreciably higher capacity utilization than those in Group 3. Costs in 1969-70 were generally higher than in the previous year due to lower volumes. With the exception of Group 1, average capacity utilization, or volume, was higher for all groups in 1968-69 than in 1969-70.

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 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/}

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

^{4/} For definitions of terms, allocation of costs, and cost adjustments, see the appendix.

^{5/} See footnote 3.

Table 2.--Sample gin costs per bale, by ranges and averages, Groups 1-4 and all groups combined, Delta counties of Arkansas, Louisiana, Mississippi, and Missouri, 1968-69 season 1/

| Cost items 2/ | Group 1 | | Group 2 | | Group 3 | | Group 4 | | All groups | |
|----------------------------------|-------------|---------|-------------|---------|-------------|---------|-------------|---------|------------|---------|
| | Range | Average | Range | Average | Range | Average | Range | Average | Range | Average |
| | Dollars | | | | | | | | | |
| Management..... | 0.96- 5.63 | 2.93 | 0.68- 4.02 | 1.97 | 1.09- 6.03 | 1.96 | 0.94- 2.36 | 1.19 | 1.78 | |
| Insurance..... | .21- 2.45 | .72 | .29- 1.58 | .67 | .23- 1.40 | .46 | .22- .60 | .35 | .50 | |
| Taxes..... | .15- 1.42 | .52 | .07- .80 | .37 | .09- .58 | .31 | .02- .65 | .25 | .32 | |
| Energy..... | .96- 5.42 | 2.15 | .51- 2.83 | 1.43 | 1.14- 2.65 | 1.62 | .99- 2.40 | 1.73 | 1.66 | |
| Labor..... | 2.94- 6.26 | 3.79 | 2.33- 4.92 | 3.50 | 1.60- 4.40 | 2.96 | 1.40- 4.20 | 2.83 | 3.13 | |
| Bagging and ties..... | 2.39- 3.74 | 2.68 | 1.94- 3.00 | 2.63 | 2.46- 2.78 | 2.66 | 2.09- 2.90 | 2.61 | 2.64 | |
| Repairs..... | .59- 8.31 | 2.40 | .79- 3.19 | 1.87 | .43- 3.87 | -1.88 | .75- 1.88 | 1.32 | 1.73 | |
| Miscellaneous..... | .47- 3.34 | 1.38 | .20- 1.63 | .77 | .20- 2.50 | .92 | .08- 1.50 | .58 | .80 | |
| Out-of-pocket subtotal 3/..... | 10.50-26.40 | 16.57 | 10.36-17.55 | 13.19 | 8.94-20.30 | 12.77 | 8.78-14.24 | 10.86 | 12.56 | |
| Depreciation..... | 1.40- 7.15 | 2.78 | .14- 6.56 | 1.98 | 1.24- 7.04 | 3.35 | 2.34- 4.85 | 3.72 | 3.07 | |
| Interest..... | 0.00- 3.73 | .37 | 0.00- 1.99 | .45 | 0.00- 2.81 | .66 | 0.00- 2.68 | 1.00 | .70 | |
| Total..... | 15.21-31.84 | 19.72 | 11.58-24.58 | 15.62 | 12.48-23.47 | 16.77 | 13.49-18.49 | 15.57 | 16.33 | |
| Replacement depreciation 4/..... | 4.55-29.58 | 8.43 | 3.09-13.12 | 4.76 | 1.97-11.06 | 4.96 | 2.69- 9.38 | 4.20 | 4.97 | |
| Replacement interest 4/..... | 2.53-16.38 | 4.68 | 1.69- 7.18 | 2.62 | 1.08- 6.00 | 2.69 | 1.44- 5.05 | 2.25 | 2.71 | |
| Total replacement 5/..... | 22.60-70.39 | 29.69 | 15.48-35.79 | 20.57 | 14.83-31.75 | 20.41 | 15.27-28.26 | 17.32 | 20.24 | |

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.

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

3/ Sample gin cost excluding depreciation and interest.

4/ Depreciation at 7 percent, based on 1970 replacement costs; interest at 7 percent on land value and one-half 1970 replacement cost.

5/ 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 gin costs per bale, by ranges and averages, Groups 1-4 and all groups combined, Delta counties of Arkansas, Louisiana, Mississippi, and Missouri, 1969-70 season 1/

| Cost item 2/ | Group 1 | | Group 2 | | Group 3 | | Group 4 | | All groups | |
|----------------------------------|-------------|---------|-------------|---------|-------------|---------|-------------|---------|------------|---------|
| | Range | Average | 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 | 2.01 | 2.01 |
| Insurance..... | .40-1.64 | .79 | .33-1.30 | .68 | .27-.86 | .50 | .28-.66 | .41 | .56 | .56 |
| Taxes..... | .18-1.25 | .53 | .09-.99 | .41 | .10-.61 | .30 | .03-.66 | .30 | .36 | .36 |
| Energy..... | .90-4.23 | 2.04 | .52-3.18 | 1.44 | .98-2.52 | 1.66 | 1.17-2.52 | 1.72 | 1.67 | 1.67 |
| 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 | 3.42 | 3.42 |
| 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 | 3.04 | 3.04 |
| Repairs..... | .65-9.06 | 2.50 | .75-3.53 | 1.63 | 1.36-3.16 | 2.08 | .66-4.53 | 2.14 | 2.04 | 2.04 |
| Miscellaneous..... | .55-5.41 | 1.76 | .21-1.79 | 1.07 | .44-1.50 | 1.01 | .18-1.44 | .49 | .96 | .96 |
| Out-of-pocket subtotal 3/..... | 12.19-37.05 | 17.48 | 11.27-16.95 | 13.85 | 10.70-20.41 | 14.03 | 10.19-16.83 | 12.83 | 14.05 | 14.05 |
| Depreciation..... | 1.06-4.64 | 2.29 | .16-6.81 | 2.25 | 1.09-7.52 | 3.16 | 2.66-8.16 | 4.36 | 3.19 | 3.19 |
| Interest..... | 0.00-3.23 | .44 | 0.00-3.25 | .78 | 0.00-2.60 | .56 | 0.00-3.91 | 1.26 | .82 | .82 |
| 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 | 18.05 | 18.05 |
| Replacement depreciation 4/..... | 4.48-18.10 | 7.67 | 3.07-11.93 | 5.26 | 2.09-8.67 | 5.12 | 2.81-8.32 | 5.31 | 5.53 | 5.53 |
| Replacement interest 4/..... | 2.50-10.02 | 4.26 | 1.69-6.53 | 2.89 | 1.14-4.69 | 2.78 | 1.51-4.48 | 2.84 | 3.01 | 3.01 |
| Total replacement 5/..... | 20.44-65.17 | 29.42 | 17.58-35.40 | 21.99 | 13.93-30.58 | 21.93 | 17.30-29.27 | 20.99 | 22.59 | 22.59 |

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.

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

3/ Sample gin cost excluding depreciation and interest.

4/ Depreciation at 7 percent, based on 1970 replacement costs; interest at 7 percent on land value and one-half 1970 replacement cost.

5/ 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 4.--Estimated sample gin costs per bale at 70-percent capacity utilization, Groups 1-4 and all groups combined, Delta counties of Arkansas, Louisiana, Mississippi, and Missouri, 1968-69 and 1969-70 season ^{1/}

| Cost items ^{2/} | 1968-69 | | | | 1969-70 | | | | | |
|--|---------|---------|---------|---------|---------------------|---------|---------|---------|---------|---------------------|
| | Group 1 | Group 2 | Group 3 | Group 4 | All groups combined | Group 1 | Group 2 | Group 3 | Group 4 | All groups combined |
| Management..... | 1.90 | 1.81 | 1.55 | 1.04 | 1.47 | 2.05 | 1.77 | 1.71 | 1.04 | 1.54 |
| Insurance..... | .50 | .62 | .38 | .31 | .42 | .58 | .59 | .40 | .32 | .43 |
| Taxes..... | .31 | .34 | .23 | .20 | .25 | .35 | .34 | .21 | .19 | .25 |
| Energy..... | 1.75 | 1.37 | 1.43 | 1.60 | 1.52 | 1.81 | 1.33 | 1.47 | 1.47 | 1.49 |
| Labor..... | 2.91 | 3.28 | 2.48 | 2.44 | 2.69 | 3.39 | 3.14 | 2.71 | 2.47 | 2.81 |
| Bagging and ties..... | 2.80 | 2.65 | 2.65 | 2.61 | 2.65 | 2.84 | 3.04 | 3.03 | 3.15 | 3.05 |
| Repairs..... | 2.35 | 1.77 | 1.69 | 1.27 | 1.64 | 2.80 | 1.60 | 2.10 | 2.01 | 2.06 |
| Miscellaneous..... | ↑1.42 | .74 | ↑.98 | ↑.64 | ↑.86 | 1.74 | 1.03 | →1.01 | ↑.53 | →.95 |
| Out-of-pocket subtotal ^{3/} | 13.93 | 12.58 | 11.38 | 10.11 | 11.51 | 15.55 | 12.84 | 12.64 | 11.19 | 12.57 |
| Depreciation..... | 1.67 | 1.82 | 2.43 | 2.95 | 2.38 | 1.51 | 1.87 | 2.21 | 2.74 | 2.23 |
| Interest..... | .22 | .41 | .48 | .79 | .54 | .29 | .65 | .39 | .79 | .57 |
| Total..... | 15.83 | 14.81 | 14.29 | 13.84 | 14.43 | 17.36 | 15.36 | 15.25 | 14.72 | 15.37 |
| Replacement depreciation ^{4/} | 5.08 | 4.37 | 3.58 | 3.33 | 3.85 | 5.07 | 4.37 | 3.58 | 3.33 | 3.86 |
| Replacement interest ^{4/} | 2.82 | 2.40 | 1.95 | 1.79 | 2.10 | 2.81 | 2.40 | 1.95 | 1.79 | 2.10 |
| Total replacement ^{5/} | 21.84 | 19.35 | 16.91 | 15.22 | 17.46 | 23.43 | 19.61 | 18.17 | 16.31 | 18.54 |
| Bales..... | 2,989 | 3,881 | 6,509 | 11,656 | 5,722 | 3,009 | 3,881 | 6,509 | 11,656 | 5,671 |

^{1/} Group 1--peak 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.

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

^{3/} Sample gin cost excluding depreciation and interest.

^{4/} Depreciation at 7 percent, based on 1970 replacement cost. Interest at 7 percent on land value and one-half 1970 replacement cost.

^{5/} 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 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, home office cost (line companies); social security taxes, workmen's compensation insurance, and any other insurance on management and office personnel.

Depreciation: Includes allowances for depreciation exactly as carried on gin records.

Interest: Includes interest exactly as carried on gin records and also computed with a standard rate based on the current replacement value of gin plants.

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

Taxes: Includes all taxes on real property only.

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

Labor: Includes gin wages, social security, workmen's compensation, and other insurance on gin labor borne by the gin plus any rental housing furnished labor. (Excludes gin repair labor; see "repairs" below.)

Bagging and ties: Includes actual cost of bagging and ties purchases.

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

Miscellaneous: Includes combined car and pickup, tractor, and other automotive expense; telephone and telegraph; advertising and promotion; legal and audit; dues (except \$1 per bale Cotton Board assessment for research and promotion and National Cotton Council dues), memberships, and subscriptions;

annual meetings, 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.

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/

6/ See footnote 3.

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