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The Economics of Cotton Gin Operation

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OF

COTTON GIN OPERATION

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This bulletin is a revision of bulletin number 403 which was issued in June 1944. The study reported in the previous issue has been continued for the second year in the same area and expanded to include the gins located in four counties in Northern Mississippi. The research was conducted jointly by the Agricultural Economics Department of the Mississippi Experiment Station and the Research and Testing Division, Cotton and Fiber Branch, Office of Marketing Services, Washington, D. C.

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Appreciation is extended to the General Education Board for grant of funds that made it possible for the Agricultural Economics Department of the Mississippi Experiment Station to participate in this study.

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The Economics of Cotton Gin Operation

BY

D. GRAY MILEY AND ARTHUR L. ROBERTS[1]

Inasmuch as cotton is a raw product of the textile and other industries it has to compete at the point of entry into these industries with all other products that can be substituted for cotton. That is, the focal point of the serious competition facing cotton is the price of cotton as a raw product compared with the price of other products both natural and synthetic that can be readily substituted for cotton. So long as these competing products can be substituted for cotton on fairly equal terms the price of cotton laid down at the manufacturer's door will be the major determining factor in the competitive process. If the textile, tire or other manufacturer can buy rayon and make it into products that the consuming public will buy in such quantities as to net him more profit than he can make from cotton goods, he is very likely to use rayon as a raw product.

In this competitive process the product that is of the highest quality and sells for the lowest price will be in greatest demand. The cotton gin plays a very important part in preparing good quality cotton for the market. The modern cotton gin does not eliminate the need for careful picking and handling of the seed cotton, but when properly operated it can take carefully picked cotton and turn out an attractive bale of lint. Neither can the gin put into the fibers any length and quality that is not already there. The modern gin can preserve the length and quality that is there and remove the major part of the grade lowering content of foreign matter. With driers and the latest cleaning equipment cotton that is delivered to the gin in reasonably good condition will turn out a good sample.

For several years the average staple length of cotton produced in Mississippi has been increasing in the hill areas of the State and decreasing in the Delta area. The entire State is tending toward the production of the medium staple cottons

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that range from an inch to an inch and three thirty-seconds in length. For the hill areas, this means the production of cottons that are of a higher quality from the standpoint of staple length than the short cottons formerly produced.

However, along with this increase in staple length has come a constant decline in average grades. This decline has been such that the increased value that should have come with the increased staple length has been almost completely offset by the decline in grade, and the monetary return to the producer has not increased as much as was expected.

It is a known fact that the short staple cottons can be ginned more readily and a satisfactory sample can be secured with less care and equipment than is the case with the longer cottons. With the short cottons the foreign matter, which is one of the main grade lowering factors, sifts out quite readily in the ginning process and a good sample is secured without the use of elaborate cleaning equipment. With the longer cottons, however, the trash, leaves and other foreign matter is much harder to remove.

One of the major assumptions of this study was that modern well equipped cotton gins would give a better grade of ginned cotton with all staple lengths but more especially with the longer cottons, than those gins that were not so well equipped. A companion assumption was that the lack of proper cleaning, drying, and ginning equipment was partly responsible for the lower grades obtained with the longer cottons that are being grown.

METHOD OF STUDY

This is the second year in which the operations of cotton gins in four counties in central Mississippi have been studied rather intensively.[2] In addition to this same group of gins, information was obtained for the gins that operated in Marshall, Benton, Tippah, and Alcorn Counties. Detailed appraisals were made of each gin during the ginning season and were used as a basis for dividing the gins into groups according to their

[2]Results of the first year's work were reported in Mississippi Experiment Station bulletin number 403, "Economic and Cost Study of Cotton Ginning in Central Mississippi", by D. Gray Miley and Arthur L. Roberts.

mechanical ability to perform an efficient job of ginning as well as for the purpose of charging depreciation and interest in the cost calculations. In addition to this information, detailed cost records were obtained by personal contact with the ginners at the close of the 1944 ginning season. The grades of cotton ginned on each gin were obtained from the Cotton Classing Officer of the Office of Marketing Services, WFA, at Jackson, Mississippi, and Memphis, Tennessee.

GENERAL CHARACTERISTICS OF THE GINS

Complete information was obtained for 50 gins in central Mississippi and 42 gins in the four counties in the northern

Table 1. The number, volume, size, age, capital investment and other factors of general information about the groups of gins included in this study, Mississippi, 1944

	Modern gins	Average gins	Sub-standard gins	All gins
Number of gins	23	39	30	92
Volume:				
Total bales ginned	44149	49712	28786	122647
Bales per gin	1920	1275	960	1333
Bales per gin stand	526	382	335	409
Age of gins, years	8	14	18	14
Number of gin stands	84	130	86	300
Stands per gin	3.6	3.3	3.0	3.3
Average number of saws per stand	80.0	76	74	76
Capital investment:				
Estimated replacement value, dollars	587523.41	857776.24	551390.30	1996689.95
Estimated present value, dollars	393929.52	463164.06	242120.90	1099214.48
Replacement value per gin, dollars	25544.96	21994.26	18379.68	21703.15
Present value per gin, dollars	17127.37	11876.00	8070.70	11947.98
Percent present value is of replacement value	67	54	44	55
Present value per stand, dollars	4689.64	3562.80	2815.36	3664.05
Present value per bale, ginned, dollars	8.92	9.32	8.41	8.96

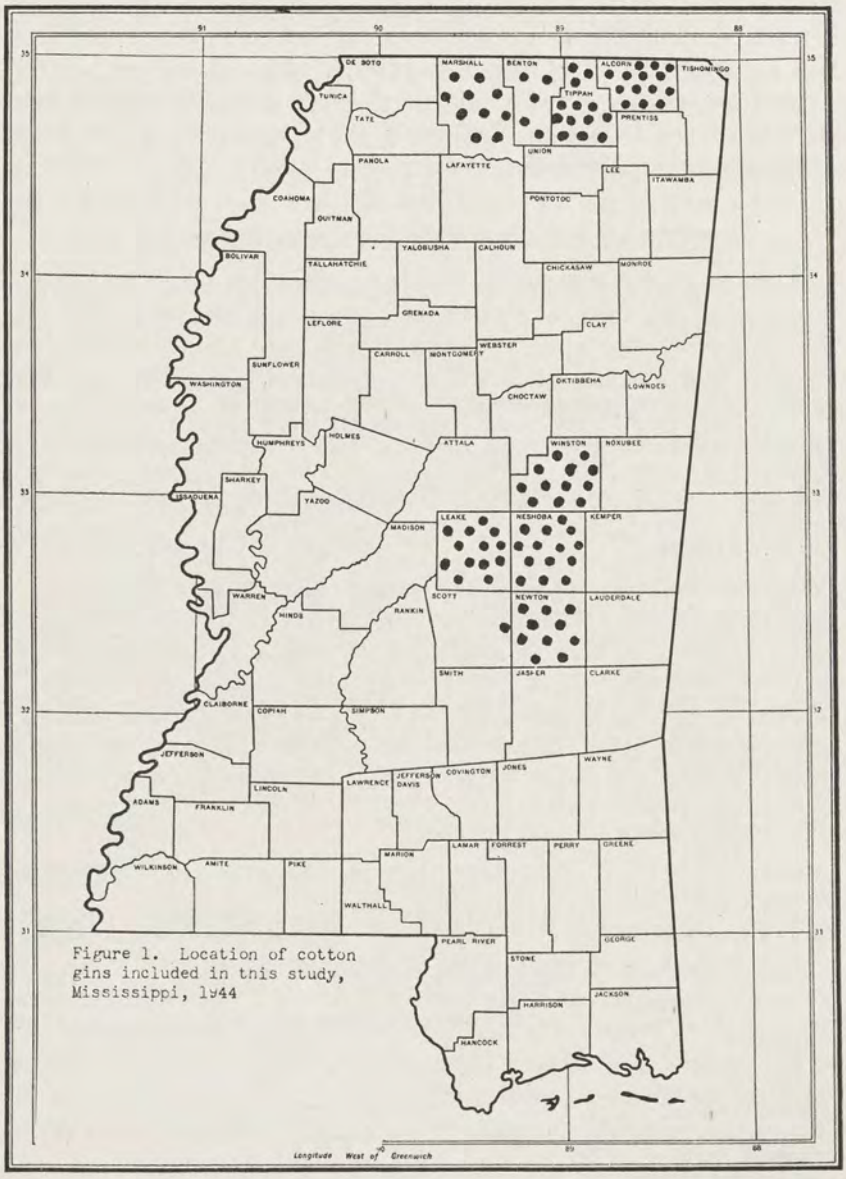

Figure 1. Location of cotton gins included in this study, Mississippi, 1944

part of the State. The location of these gins is shown in figure 1. On the basis of the detailed appraisal information, the gins were divided into three groups: (1) modern gins, those equipped to do the best job of ginning; (2) average gins, those gins that were considered to have about average ginning equipment; and (3) sub-standard gins, those gins that were poorly equipped and were in poor operating condition.[3] Some general information about the gins in each of these groups is given in table 1.

The 92 gins handled a total of 122,647 bales during the 1944 season, or an average of 1333 bales per gin and 409 bales per gin stand. The 23 modern gins had an average volume of 1920 bales per gin, while the 30 sub-standard gins handled an average of 960 bales per gin. The average age of the modern gins was 8 years, as compared to an average of 18 years for the sub-standard group and 14 years for all 92 gins. In size, the modern gins had an average of 3.6 stands and the sub-standard group an average of 3 stands per gin. All of the modern gins except one had 80 saws per gin stand. Many of the older gins in the sub-standard group had 70-saw stands and a few had 60-saw stands, the average for this group being 74 saws.

The estimated replacement value of these 92 gins is slightly under 2 million dollars, or an average of $21,703. The present value, however, averages only $11,948 or 55 percent of the replacement value. This means that the average gin in these areas has been in operation about half of its expected period of service. The present value of the modern gins is almost 67 percent of the replacement value, while for the sub-standard group the average is 44 percent.

The averages for the gins in the two areas were very similar and in most instances in this report they are combined. Where there are significant differences the data will be shown for both areas.

FINANCIAL SUMMARY

The cost of labor is by far the most important expense item connected with the operation of cotton gins. (Table 2.) The

[3]The appraisal work and the division of the gins into groups was done by technicians from the U. S. Cotton Ginning Laboratory, Stoneville, Mississippi.

labor costs during the 1944 ginning season amounted to almost half of the total current expenses. The very high cost of hired labor services emphasize the importance of using labor as efficiently as possible. The influence of the efficient use of labor on the cost of operating gins will be discussed later in this report.

During the past season good gin labor was not only hard to obtain but the wages received were fairly high compared to previous years. The other expense items that were of major importance were the cost of fuel or power, insurance, taxes, and maintenance and repairs. In all cases the current expenses were highest for the modern gins and progressively lower for the other two groups. The overhead expenses included salary for management, depreciation on the machinery and equipment, and interest on the investment. The depreciation was figured at 5 percent on the machinery and equipment and 4 percent on most of the buildings. In the few cases where there were all-steel or brick buildings, depreciation was calculated at 3 percent. Interest on the investment was figured at 4 percent per year

Table 2. Summary of average expenses and income for 88 gins, by groups, according to the condition of the ginning equipment, Mississippi, 1944

Item	23 Modern gins	37 Average gins	28 Sub-standard gins	All 88 gins
Current expenses:				
Labor	$1684.71	$1325.18	$ 936.49	$1295.47
Fuel or Power	452.33	331.70	279.65	346.67
Materials	84.56	75.94	60.73	73.35
Insurance	343.61	253.55	142.34	241.70
Taxes	220.48	174.99	115.26	167.88
Maintenance and repairs	457.57	452.85	321.46	412.24
Other costs	282.38	156.39	112.45	175.34
Total current expenses	$3525.64	$2770.49	$1968.38	$2712.64
Overhead:				
Salary for management	$ 656.26	$ 453.51	$ 485.21	$ 516.59
Depreciation	805.89	561.37	370.71	564.62
Interest (4 percent)	686.04	470.78	311.17	476.26
Total overhead	$2148.19	$1485.66	$1167.10	$1557.46
Total cost	$5673.82	$4256.16	$3135.48	$4270.10
Fees for ginning	$6901.04	$4655.58	$3142.59	$4761.05
Profit on ginning operation	$1227.21	$ 399.41	$ 7.11	$ 490.95
Net income from cottonseed	$2628.28	$1907.87	$1268.60	$1892.76
Net income from bagging and ties	$ 471.95	$ 294.03	$ 221.09	$ 317.32
Net profit	$4327.45	$2601.32	$1496.79	$2701.03

on the present value of the gin plant. As was the case with the current expenses, the overhead costs were highest for the modern gins and lowest for the gins in the sub-standard group. For the most part, the overhead costs do not have to be paid immediately.

The salary for management is that amount which is allowed to pay for the services of the person who is responsible for the direction of the gin enterprise. In many cases the owner was the operator, and in addition to managing the entire business he did a considerable part of the actual work connected with operating the gin plant. In other cases the owner did most of the work of operating the gin and exercised full managerial supervision of the business. In arriving at a figure to enter as a salary for management, an attempt was made to arrive at an estimate of what it would cost to hire someone at going wage rates to perform the managerial and other functions actually handled by the owner of the business. The average estimate for all of the gins amounted to slightly over $500 per gin.

Depreciation is a cost that has to be met sooner or later if a gin operator is to continue in business for any length of time. If reserves for taking care of the depreciation are not set aside currently, the present gin plant will go out of existence when the machinery and equipment is worn out. The owners of gins can take the amount alloted for depreciation and "live it up" if they care to, but if a majority of the operators of gins do not set aside sufficient funds to replace their plants the entire ginning industry will gradually go down. This cost of depreciation is, therefore, one that has to be met as the ginning industry goes along if it is to maintain itself over any period of time and perform a satisfactory service.

The item of interest on the investment is another cost that has to be met if capital is to continue to flow into the ginning industry in sufficient quantities to maintain the industry at its present level. As has already been pointed out, the amount of capital invested in gin plants is fairly high in comparison to the amount of time the facilities are used during any one season. Ginners or other investors do not put capital into gin plants unless there is an opportunity to realize at least as much return as they could realize from what would be considered ordi-

narily safe investments. In other words, if a person can derive 3 percent interest on government bonds he is not likely to put his money in a somewhat risky enterprise that promises to earn no more than 3 percent. From this standpoint, in order to have capital continue to flow into the ginning industry in sufficient quantities to maintain the industry at its present level, it is necessary that the ginning industry offer at least as good an opportunity as other investment possibilities. For the 88 gins included in this study the average interest on investment was $476.

The combined overhead costs amounted to $1557 for all of the gins. When the overhead and current expenses are combined, the average gin had a total cost of $4270 during the 1944 season. This is about $700 higher than the average cost for the 43 gins studied in 1943. Practically all items of expense were higher during the 1944 season than for the previous year. These higher costs, however, were more than completely offset by increased income from performing the ginning service. The major part of this increase in income was due to the increased amount of cotton ginned. The average gin in 1944 had a volume of 1333 bales, compared with an average of 1053 bales for the previous season.

After allowing for all current expenses, salary for management, depreciation, and interest on the investment, the average gin in 1944 returned a net profit of $491 on the ginning operation. The modern gins had a net profit of $1227 whereas, the sub-standard gins had a profit of only $7.00. In arriving at these net profit figures on the ginning operation, the entire costs of operating the business were charged against the income received from the performance of the ginning service.

In addition, the ginners had what they made on handling cottonseed and bagging and ties. The handling of seed was quite profitable during the past season and the average ginner made $1893 net income from handling cottonseed. Almost all ginners make a net income of around $0.25 per bale for bagging and ties. This item amounted to an average of $317 per gin. When all of these items were combined, the average gin operator had a net profit of $2701 during the 1944 season. It should be emphasized that this amount of profit was made after

allowing a reasonable salary for management, depreciation on the gin plant, and 4 percent interest on the investment. For the modern gins the net profit amounted to $4327 and for the sub-standard gins the profit was $1497.

It is readily observed from this summary that even though almost all items of expense were higher in 1944 than they had been previously, the income also was considerably higher and resulted in all groups of gins returning a reasonable profit for the gin operations of this season.

COST AND INCOME PER BALE

The average cost for ginning a bale of cotton was $3.10. (Table 3.) The average income for performing the ginning service was $3.46 per bale, thus leaving a net profit of $0.36 per bale on the ginning operation. In addition to the profit made on the ginning operation, the average gin operator had a net income of $1.37 per bale from cottonseed and made $0.23 per bale from bagging and ties. When these three items of

Table 3. Summary of the cost and income per bale of cotton ginned for 88 cotton gins, by groups, according to the condition of the ginning equipment Mississippi, 1944

Item	23 Modern gins	37 Average gins	28 Sub-standard gins	All 88 gins
Current expenses:				
Labor	$ .88	$1.02	$ .91	$ .94
Fuel or power	.24	.25	.27	.25
Materials	.04	.06	.05	.05
Insurance	.18	.19	.14	.18
Taxes	.11	.13	.12	.12
Maintenance and repairs	.24	.35	.31	.30
Other costs	.15	.12	.11	.13
Total current expenses	$1.84	$2.12	$1.91	$1.97
Overhead:				
Salary for management	$ .34	$ .35	$ .47	$ .38
Depreciation	.42	.43	.36	.41
Interest (4 percent)	.36	.36	.30	.35
Total overhead	$1.12	$1.14	$1.14	$1.13
Total cost	$2.96	$3.26	$3.05	$3.10
Fees for ginning	$3.60	$3.57	$3.06	$3.46
Profit on ginning operation	$ .64	$ .31	$ .01	$ .36
Net income from cottonseed	$1.37	$1.46	$1.23	$1.37
Net income from bagging and ties	$ .25	$ .23	$ .22	$ .23
Net profit	$2.25	$1.99	$1.46	$1.96

income are combined, the average operator received a net profit of $1.96 for each bale ginned during the 1944 season. The average net profit for the 43 gins included in the study during the 1943 season was $1.23 per bale. The net profit during 1944 ranged from $2.25 per bale for the modern gins to $1.46 per bale for the sub-standard gins.

It is interesting to note that the fees charged for performing the ginning services were somewhat higher for the modern gins than for those in the sub-standard group. On the other hand the average cost for performing the ginning services was lowest for the modern gins, thus leaving a net profit of $0.64 per bale for the modern gins and only $0.01 per bale for the sub-standard gins. Apparently the modern gins were able to charge a higher rate for the ginning service and still maintain a much higher average volume than the sub-standard gins even though the latter group charged a lower rate for this service. This is contrary to the situation found in the Central Area during the previous season when the sub-standard gins charged a little higher rate for the ginning service than the more modern gins. For the entire group of gins during the 1944 season, the average current expense was $1.97 per bale. Almost 50 percent of the current expenses was made up of labor costs. Fuel or power costs accounted for about 12 percent of the current expenses, and maintenance and repairs about 15 percent. The remaining costs were made up of insurance, taxes, and minor miscellaneous items.

The total overhead costs amounted to $1.13 per bale. In other words, of the total cost of $3.10 for performing the ginning service, the overhead costs were 36 percent and the current expenses 64 percent of the total. Thus as has already been emphasized, the overhead charges necessary to manage and take care of the investment in a gin plant constitute a considerable proportion of the total costs.

LABOR, FUEL AND POWER REQUIREMENTS FOR GINNING

It required an average of 2.9 hours of man labor, including the time of the manager, to gin a bale of cotton during the 1944 season. (Table 4.) The modern gins used 2.6 hours per

bale and to do the same job required an average of 3.3 hours for the sub-standard gins.

There were 40 gins that used Diesel engines as a source of power. These engines used an average of 1.6 gallons of Diesel fuel per bale ginned. The modern gins used an average of 1.4 gallons per bale while at the same time the sub-standard group used 1.8 gallons.

The 15 gins that used electric power consumed an average of 19 kilowatt hours per bale of cotton ginned. Here too the modern gins consumed the smaller quantity, the average for this group being 17.2 kilowatt hours as compared with 25.1 for the sub-standard group. Fourteen of the 15 electrically operated gins used in this analysis were in the North Mississippi Area where TVA power is available.

There were 10 other fuel burning engines that used either tractor fuel or fuel oil. There were not sufficient numbers of

Table 4. Quantities of labor, fuel and power used in the ginning operation, by groups of gins, Mississippi, 1944

Item	Modern gins	Average gins	Sub-standard gins	Average all gins
Labor:				
Number of gins	23	36	30	89
Hours per gin	4950	3729	3156	3851
Hours per bale	2.6	2.7	3.3	2.9
Diesel fuel:				
Number of gins	13	19	8	40
Gallons per gin	3418	2427	2252	2714
Gallons per bale	1.4	1.8	1.8	1.6
Electric power:				
Number of gins	4	8	3	15
KWH per gin	42860	24573	19764	28488
KWH per bale	17.2	19.5	25.1	19.0
Fuel oil or tractor fuel:				
Number of gins	1	2	7	10
Gallons per gin	2736	3425	2900	2988
Gallons per bale	3.2	3.3	3.3	3.3
Gasoline:				
Number of gins	2	5	2	9
Gallons per gin	4612	3559	2262	3505
Gallons per bale	3.3	3.0	3.0	3.1

these to give reliable averages for all the groups but the combined average was 3.3 gallons of fuel per bale ginned.

Power plants that used gasoline for fuel were used in 9 gins, all of which were in the Central Mississippi Area. These gins burned an average of 3.1 gallons of gasoline for each bale ginned.

The average quantities of fuel and the average hours of labor required to operate cotton gins with the same type of equipment do not vary greatly from year to year. Consequently, the average figures for labor and fuel requirements can be used for several years to make estimates of the cost of operating gins.

FACTORS THAT INFLUENCE GINNING INCOME

Size and Volume

As was pointed out earlier in this report the cotton gin is used for only a short period out of each year. Because of the relatively high investment in plant and equipment and this short period of use, it is necessary that a gin plant be operated efficiently and at near capacity throughout the ginning season if a reasonable return is to be made from the operation. The importance of this fact is shown in table 5 where the gins have been grouped by size, as measured by number of stands, and by volume in terms of bales ginned.

Small two-stand gins that ginned less than 600 bales during the season lost an average of $1.15 for every bale ginned. On the other hand, the two-stand gins that ginned over 900 bales made a net income of $0.58 for each bale ginned. As the volume increased the total cost per bale as well as the hours of labor per bale declined significantly. Because of the relatively large overhead cost involved, small gins have difficulty making any profit with a volume that runs less than 500 bales per gin stand.

The relationship for three-stand gins was the same as for the smaller gins. Those that ginned less than 1000 bales had high average costs, substantial average losses, and used a large amount of labor per bale. On the other hand the gins that handled over 1400 bales made an average net income of $0.81 per bale. The three-stand gins had to have an average of about

Table 5. The relationship of the number of bales of cotton ginned to the cost, income, and other factors of gin operation for various sizes of gins, Mississippi, 1944

Size and volume	No. of gins	Bales per gin	Total cost per bale	Net income per bale	Net income per gin	Hours of labor per bale
2 stands:						
Bales ginned:						
Under 600	4	511	$4.63	$—1.15	$—574.01	4.03
600 - 900	5	742	4.17	—.60	—422.14	3.35
Over 900	5	978	3.07	.58	578.91	2.86
3 stands:						
Bales ginned:						
Under 1000	10	636	$5.18	$—1.56	$—867.98	4.60
1000 - 1400	15	1178	3.33	.34	539.02	2.87
Over 1400	16	1627	2.73	.81	1346.16	2.40
4 or more stands:						
Bales ginned:						
Under 1300	10	1035	$4.21	$ —.72	$—552.37	3.11
1300 - 2000	12	1572	3.04	.43	725.76	2.66
Over 2000	11	2488	2.81	.75	1965.43	2.54

450 bales per stand before they returned an average net income. The additional overhead cost necessary to operate a three-stand gin over that which is required for a two-stand gin is not large enough to require the same number of bales per stand for a "break even" volume.

The same relationship between volume, cost, and income holds true for the large gins. That is, the four-stand gins with large volumes had lower costs per bale, used less labor per bale, and made more profit than the low volume gins. The "break even" volume for these larger gins was around 400 bales per gin stand.

The general relationship of volume of ginnings and the total cost per bale is shown in figure 2. Other factors, such as labor efficiency, and type and condition of the machinery and power plant, cause some scatter of the individual gins around the general trend line but there can be little question about the fact that the cost of ginning declines as the volume increases. The decline is very sharp until a volume of around 1000 bales is reached. From about 1000 to around 2000 the decline continues downward but at a decreasing rate. Above 2000 bales

the costs tended to average about the same. This may be due to the fact that there were not enough gins with high volumes to set a definite trend line or it may be that additional economies are hard to realize after a volume of around 2000 bales is reached with a four-stand gin.

The operation of a gin of any size requires a crew that is governed by the size of the gin. This basic or skeleton crew usually has to be on hand during most of the ginning season. Therefore, the cost of this crew, as well as the interest and depreciation on the gin plant, go on whether 500 or 2000 bales are handled. But if a four-stand gin has around 2000 to 2500 bales to gin during a normal season the labor and the equipment can be used to capacity for the major part of the season. If a bale can be ginned every 15 minutes during a 10-hour day, 40 bales can be ginned per day. At this rate 2000 bales would give 50 full 10-hour days at near capacity. When above this amount is handled it means that the labor has to be worked overtime or a night crew has to be employed. Because of these factors the further reduction of the average per bale costs be-

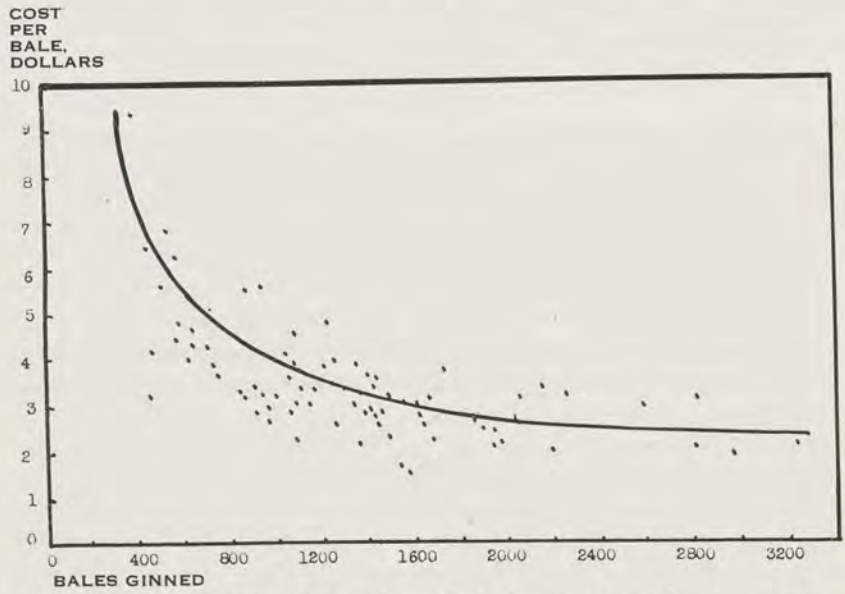

Figure 2. Relationships of the volume of ginnings to the total cost per bale.

comes more and more difficult after a volume of 2000 to 2500 bales is reached for a four-stand gin. Very likely the costs can be reduced still more with larger gins serving larger territories which furnish proportionately larger volumes. The same result could be brought about if the ginning season could be extended to cover a longer period. It might be economically possible for some of the larger gins to provide storage space for some of the seed cotton during the peak harvesting period and gin it during slack periods. The cost of providing such storage would have to be low enough to equal the reduced cost brought about by the more efficient operation, after allowing for the cost of present methods of storage, or the total cost of ginning might be increased. In other words, cotton has to be stored somewhere and it may be that a certain amount of storage could be provided at the gin at low enough cost to bring about economies in the performance of the ginning service. Such storage would have to be constructed so that the cotton or the seed would not deteriorate and would have to be situated so that the cotton could be handled by the suction system of the gin plant. Perhaps one of the greatest drawbacks to such a plan would be the reluctance of producers to wait for any length of time to get their cotton ginned.

Use of Labor

The efficient use of the labor that is employed to run the gin plant is very important if a profit is to be made on the operation. One of the most important ways to increase labor effiency is to be sure of enough volume to keep the force fully employed. But for gins that have about the same volume of ginnings some use nearly twice as much labor as others. (See table 6.) For example, 8 gins that had a volume of less than 1000 bales used an average of 2.5 hours of labor per bale ginned, while 8 other gins in the same volume group used an average of 5.5 hours of labor for each bale ginned. The former group had an average net profit of $0.09 per bale and the latter a net loss of $2.60 for every bale ginned. Of course not all this loss was due to the inefficient use of labor, but there can be little question that it was a major factor in increasing the cost of operation and thus reducing the profits.

Table 6. The relationship of the hours of labor per bale of cotton ginned to the cost, income, and other factors of gin operation for various volume groups, all sizes of gins combined, Mississippi, 1944

Group	No. of gins	Bales per gin	Hours of labor per bale	Total cost per bale	Net income per bale	Net income per gin	Average number of gin stands
Ginned Less than 1000 bales: Hours per bale:							
1.9 - 3.0	8	831	2.5	$ 3.46	$ .09	$ 109.87	2.8
3.1 - 4.0	8	680	3.6	3.97	—.36	—186.46	2.2
4.1 - 7.4	8	585	5.5	6.15	—2.60	—1393.77	3.0
Ginned 1000-1500 bales: Hours per bale:							
1.8 - 2.9	10	1250	2.5	$ 3.00	$ .55	$ 689.13	3.0
3.0 - 3.5	10	1243	3.1	3.39	.26	524.92	3.2
3.6 - 5.1	9	1247	4.1	3.73	—.08	—42.01	3.8
Ginned over 1500 bales: Hours per bale:							
1.3 - 2.0	8	2098	1.6	$ 2.16	$ 1.44	$ 3031.18	3.5
2.1 - 2.6	8	2020	2.5	2.78	.85	1783.14	4.0
2.7 - 3.8	11	1993	3.1	3.13	.34	672.20	3.9

The group of gins that averaged about 1250 bales also had considerable variation in the amount of labor used. Those that used an average of 2.5 hours of labor per bale had a net profit of $0.55 for each bale ginned. On the other hand, those gins with about the same volume but which used 4.1 hours of labor per bale had a net loss of $0.08 for each bale ginned. The same relationship held for the gins that averaged ginning around 2000 bales. Those that used the least labor per bale made a net profit of $1.44 for each bale ginned; whereas, those using the highest amount of labor had a net profit of only $0.34 per bale. The economics that go with the larger volumes can be reduced materially by the inefficient use of labor.

One of the big obstacles of the ginning business is that it furnishes employment for only a short period of the year. Consequently the labor has to be brought in from farms or other places of employment to be used temporarily in the op-

eration of the gin. Under these conditions it is always difficult to secure and keep competent labor; this makes it all the more important that the ginner hire only the amount of help needed when it is needed and if possible, use the same workers year after year so they can be trained to do their particular job effectively.

Power Costs

The decision as to what type of power to use in a gin plant may determine the future financial success of the operation. It has already been pointed out that small gins with low volumes almost always lose money. This is especially true for small gins that have heavy investments in their power plants. The overhead becomes entirely too burdensome for the smaller gins to carry when they have a large amount of capital invested in a power plant.

Diesel type power was used in 41 of the gins included in this study. (Table 7.) Four of these were two-stand gins, and they had an average net loss of $0.23 per bale ginned. The rather low fuel cost of $0.20 per bale was offset by the relatively high cost of $0.26 per bale for depreciation and interest on the investment in the power plant. The larger Diesel powered gins with proportionately higher volumes had progressively lower fuel as well as interest and depreciation costs. The four-stand Diesel operated gins with an average volume of around 1900 bales used only $0.18 worth of fuel per bale. The interest and depreciation charge was $0.16, making an average cost of $0.34 per bale for the large gins that used Diesel power. The average power cost for the Diesel operated gins was $0.18 per bale for fuel and $0.20 for interest and depreciation or a total of $0.38 for each bale ginned.

The use of electric power was limited almost entirely to the North Mississippi Area where TVA power is available. The 19 gins using electric power had almost the same average volume as the Diesel powered gins and had an average power cost of $0.40 per bale and an interest and depreciation cost of $0.07 making a total of $0.47 per bale. However, the total cost was lower and the profit per bale higher for the electrically operat-

Table 7. Relationship of the type of power to average cost, income and other factors of gin operation, Mississippi, 1944

Group	No. of gins	Bales ginned	Capital value of power plant	Cost of power		Total cost per bale	Profit per bale
				Fuel cost	Interest and Depreciation		
Diesel type power:							
2-stand gins	4	808	$2060.16	$ .20	$ .26	$ 3.82	$ --.23
3-stand gins	21	1270	2537.72	.17	.21	3.62	.04
4-stand gins	16	1905	3351.31	.18	.16	3.33	.16
Average	41	1473	$2808.63	$ .18	$ .20	$ 3.53	$ .06
Electric power:							
3-stand gins	5	1286	$ 992.47	$ .34	$ .08	$ 3.32	$ .20
4-stands and over	14	1551	971.33	.42	.07	3.25	.29
Average	19	1482	$ 976.89	$ .40	$ .07	$ 3.27	$ .26
Gasoline type power:							
2-stand gins	3	851	$ 907.89	$ .48	$ .10	$ 3.39	$ .15
3-stand gins	7	1225	1771.65	.41	.13	3.11	.38
Average	10	1113	$1512.55	$ .43	$ .12	$ 3.20	$ .31
Tractor fuel type power:							
2-stand gins	3	616	$ 648.75	$ .33	$ .09	$ 3.93	$ --.50
3-stand gins	4	840	1260.31	.31	.17	4.35	--.82
Average	7	744	$ 998.21	$ .32	$ .14	$ 4.17	$ --.68
Steam type power:							
2-stand gins	2	979	$ 588.95	$ .65	$ .07	$ 4.28	$ --.57
3-stand gins	2	1183	811.31	.66	.08	3.60	--.02
4-stand gins	2	1228	676.59	.37	.05	3.36	.15
Average	6	1069	$ 692.28	$ .56	$ .06	$ 3.75	$ --.15

ed gins than for the gins operated by Diesel power. Electric power cost more per bale than did Diesel fuel, but the investment in the average electric motor was only about one-third as much as in the Diesel type motors. A further factor to consider is the amount of labor required to operate a Diesel type motor as compared with an electric motor. The large Diesel type engines require a considerable amount of engineering ability and supervision for the most efficient operation. On the other hand, the electric motors require very little more than the ability to turn a switch. This difference in labor re-

quirements was one of the main factors accounting for the lower total costs of the electrically powered gins.

The 10 gins that used gasoline engines had an average cost of $0.43 per bale for gasoline and $0.12 for interest and depreciation on the power plant making a total cost of $0.55 per bale. The average investment in gasoline engines was slightly over $1500 per gin. The gins using gasoline type of power had a lower total cost per bale than any of the other groups. This lower cost was accomplished with a smaller volume than either the electric or Diesel power groups. No doubt there are other factors that accounted for the favorable showing of these gasoline powered gins, but all the studies made so far indicate that the smaller gins with somewhere near average volumes have a greater chance of showing a profit when they make efficient use of a good gasoline engine.

The group of 7 gins that used tractor fuel or fuel oil had a fairly low average volume of 744 bales per gin. This low volume probably was the major factor contributing to the rather substantial loss shown for this group. The average cost of fuel was $0.32 per bale and for interest and depreciation $0.14, making a total cost for the other fuel burners of $0.56 per bale.

The final group shows six gins that use steam power. The average cost for steam power was higher than for any of the other groups. The major item of cost was fuel for the burners. The cost of wood and other fuel for steam engines has been very high during the war period. The average cost of fuel for the six gins was $0.56 per bale. On the other hand, interest and depreciation charges were lower than for any of the other groups, averaging only $0.06 per bale. The total per bale cost for the steam powered gins was $0.62. The two large four-stand gins using steam power compared favorably with the same size gins in the other groups in both cost and profit per bale. A major factor to be considered in the use of steam power is that the service of a full time fireman or engineer is required for the efficient operation of the power plant. To have a complete basis for comparison, the services of such a person would have to be added to the actual power costs. The steam

engines that are still in use are all old and will no doubt be replaced by other types as soon as they are no longer serviceable. Steam powered gins have been decreasing at a rapid rate during recent years.

The Use of Capital

It is almost impossible for small gins with relatively high capital investments to return a net profit on the ginning operation. (Table 8.) In order to show the influence of the efficient use of capital on income, an attempt was made to eliminate at least part of the influence of the volume of ginnings. This was accomplished by sorting the gins into groups according to the volume ginned and then re-sorting on the basis of the capital invested per bale of cotton ginned. The gins that had less than 1000 bales and had an average investment of over $14 for each bale ginned, had a net loss of $2.35 per bale. On the other hand, the gins that had less than 1000 bales but which

Table 8. The relationship of the capital investment per bale of cotton ginned to cost, income and other factors of gin operation, Mississippi, 1944

	No. of gins	Bales per gin	Average investment per bale	Average investment per gin	Total cost per bale	Net income per bale	Hours of labor per bale
Ginned below 1000 bales:							
Investment per bale:							
Below $9.00	8	874	$ 7.74	$ 6734.41	$ 3.60	$ .03	3.2
$9.00 - $14.00	10	682	11.16	7660.30	3.91	—.41	3.6
Over $14.00	10	581	19.49	11246.70	$ 5.89	—2.35	4.9
Ginned 1000-1500 bales:							
Investment per bale:							
Below $8.50	9	1352	$ 6.97	$ 9374.69	$ 2.81	$ .73	3.1
$8.50 - $10.00	13	1184	9.34	11063.29	3.57	.04	3.3
Over $10.00	11	1206	10.95	13131.81	3.71	.05	2.8
Ginned over 1500 bales:							
Investment per bale:							
Below $6.00	10	2020	$ 5.18	$10475.95	$ 2.46	$ .99	2.3
$6.00 - $9.00	11	1974	7.45	14798.25	2.80	.73	2.3
Over $9.00	10	2028	10.30	20797.11	2.96	.64	2.6

had less than $9.00 invested for each bale ginned, succeeded in making a small net profit. Part of this difference was probably accounted for by the fact that the sorting procedure used did not result in getting gins in each group with the same average volume. In the second group, however, the volume was about the same for each of the sub-groups. In this case the gins that had less than $8.50 invested for each bale ginned made a net profit of $0.73 per bale, whereas those that had over $10.00 invested for each bale ginned made only $0.05 per bale.

In the group with the highest volume, the relationship was very much the same. In this case, however, each group of gins returned a net profit but the group with the smallest amount invested for each bale ginned made the highest average profit.

It will be observed that in each group shown the gins with the highest investment per bale had the highest total investment per gin and those with the lowest investment per bale had the smallest total investment per gin; also in each case, the gins with the lowest investment per bale always had the lowest total cost per bale. This was true for every volume group. As the usual thing, the gins with the highest investment are the newer, more modern gin plants. From this standpoint they are better equipped to do an efficient job of ginning than those with small investments. However, from the standpoint of making a return from the ginning enterprise, the fact that a person has a new, modern gin plant with a high capital investment does not in any way insure the financial success of the enterprise. The success, and consequently the eventual establishment, of large, modern gin plants will be determined very largely by the ability of these plants to secure sufficient volume to insure the financial success of the operation.

Perhaps one of the major reasons why the majority of cotton gins in the Hill Areas of Mississippi have not put in modern drying, cleaning and other equipment is the fact that their volumes are not sufficient to return income enough to pay for the necessary capital to make these improvements.

FACTORS THAT INFLUENCE COTTON QUALITY

Cotton growers can maintain the quality of cotton they produce by adopting improved methods of harvesting, handling, and by selecting gins adequately equipped and efficiently managed. During the past decade farmers have begun to realize premiums for high grade cotton. This, perhaps, is due largely to closer attention to selection of improved varieties, better harvesting and ginning methods, and market values of the various grades of cotton produced.

Measures of Cotton Quality

Foreign matter content, color, and ginning preparation are the major factors of grade and they all contribute to the spinning utility of cotton lint. Ginning preparation and the average value of lint per pound are two measures of ginning quality used in this analysis of the performance of the three groups of gins in the study.

Preparation[4] is a term used to describe the degree of smoothness or the relative napiness or neppiness of ginned lint. Although the condition of seed cotton when ginned has an important effect on preparation, the manner in which it is ginned and the condition of ginning equipment frequently determine whether the preparation of lint is to be smooth or rough.

All gins used in the study were selected in areas of Mississippi where cotton varieties, soil, climatic conditions, tillage and harvesting methods, and marketing practices are unusually uniform. It has, therefore, been assumed that the principal differences in ginning preparation and in average value of lint cotton per pound would be the result of differences in the adequacy and condition of ginning machinery.

Ginning Performance Based on Official Classification

Since this part of the study is dependent on the official classification of samples submitted from each gin, the number of gins used varies slightly from the number used in the cost

[4]The Classification of Cotton, Bureau of Agricultural Economics, United States Department of Agriculture, Miscellaneous publication No. 310, 54 pp., illus., 1938.

analysis section. All gins used in this analysis, however, were used in that section.

Of the 73 gins included in this section of the study, 21 were classified as modern, 30 as average, and 22 as sub-standard. This grouping was made on the basis of the condition and adequacy of machinery in the gins. It is recognized, however, that method of operation of gin equipment may in some cases nullify the good ginning job expected from a gin having modern gin machinery.

Cotton in Mississippi at the beginning of the 1944 season was somewhat green and evidently contained too much moisture for best ginning results. This condition usually results in an increase in the proportion of roughly ginned cotton. Tests have shown that driers are an effective factor in reducing rough preparation for cotton containing an excessive amount of moisture. Only two of the gins included in the study were equipped with driers for the proper conditioning of seed cotton for ginning.

Effect of Driers on Ginning Preparation

A comparison of rough preparation for gins equipped with driers and those not so equipped is shown in table 9. Gins using driers had only 3.7 percent rough preparation. Had all gins in Mississippi been equipped with driers during the season, the benefits to cotton growers could have meant many thousands of dollars on the basis of these results.

Cotton driers, however, are comparatively expensive equipment and are usually found only in the strictly modern gins. Ginners whose volume of ginning is small usually find that the expense of driers is prohibitive and the only alternative for

Table 9. Proportion of rough ginned cotton for gins equipped with driers and not equipped with driers in selected areas of Mississippi, crop of 1944[1]

Item	Gins having driers	Gins not having driers
Total samples classed	2,725	65,994
Samples reduced 1 or more grades	100	4,459
Percentage rough preparation	3.7	6.8

[1]Based on official classification of samples submitted.

the grower is to harvest his cotton only when it is dry or patronize gins having this improved equipment.

Based on preliminary figures of the Office of Marketing Services, approximately 200,000 equivalent 500 pound bales of the 1944 cotton crop in Mississippi was reduced one or more grades because of rough ginning. It is believed that a major portion of this reduction in grade was a result of ginning cotton containing excessive moisture. Some of the reductions in grade were likely caused by too fast feeding of cotton to the gin stands as will be shown in a later table.

Factors of Gin Operation Influencing Ginning Preparation

In table 10 is set forth some factors of gin operation that have an important influence on ginning preparation. These are (1) density of seed roll, (2) saw speed, (3) condition of saws and (4) condition of ribs.

One-third of the modern gins studied ginned with loose seed rolls. While 27 percent and 23 percent of the average and sub-

Table 10. Distribution of gins in selected areas of Mississippi according to factors of gin operation affecting ginning preparation, by type of gin, crop of 1944

Item	Group					
	Modern		Average		Sub-standard	
	Number of gins	Percent	Number of gins	Percent	Number of gins	Percent
Density of seed roll:						
Loose	7	33	7	27	5	23
Medium	14	67	22	70	16	72
Tight	....	0	1	3	1	5
Total	21	100	30	100	22	100
Saw speed, r.p.m.:						
600 and above	14	67	10	33	4	18
400 to 599	7	33	19	64	15	68
399 and below	....	0	1	3	3	14
Total	21	100	30	100	22	100
Condition of saws:						
Good	14	67	18	60	5	23
Fair	7	33	10	33	7	32
Poor	....	0	2	7	10	45
Total	21	100	30	100	22	100
Condition of ribs:						
Good	15	71	11	37	9	41
Fair	6	29	16	53	7	32
Poor	....	0	3	10	6	27
Total	21	100	30	100	22	100

standard gins, respectively, operated with loose seed rolls. Two-thirds of the modern gins operated with medium seed rolls and 70 percent and 72 percent of the average and sub-standard gins, respectively, operated in this manner. None of the modern gins operated with tight seed rolls while a small percent of both the average and sub-standard gins operated with tight seed rolls.

It is imperative that gins using saw speeds of 600 revolutions-per-minute and above maintain loose seed rolls and use proper seed board settings if a good job of ginning is to be done. This speed coupled with the tight seed rolls causes considerable damage to cotton lint.

Two-thirds of the modern gins used saw speeds of 600 revolutions-per-minute and above and about the same proportion of the other two groups of gins used speeds of 400 to 599.

A major proportion of the modern gins maintained both saws and ribs in good condition. The average sub-standard gins had a considerable proportion of both saws and ribs in fair to poor condition. These factors of gin operation no doubt had quite an influence on the results of ginning as shown in the following tables.[5]

Experiments have shown that as seed rolls are allowed to approach a medium and tight condition, short fibers are pulled from the seed. This results in a slightly higher percentage of lint being produced because a larger proportion of the short fiber is removed from the seed. But manufacturing waste is higher for such cotton and staple length may be reduced because of greater irregularity in fiber length. These practices in ginning may also increase the content of motes and seed fragments in the ginned lint. This, of necessity, brings about a reduction in the class of cotton and, therefore, a loss in grade to the farmer. The increase in lint turnout does not ordinarily offset the loss resulting from the reduction in grade.

Lint Turnout

It is not surprising that, as shown in table 11, the lint percentage turnout for the three groups of gins is slightly higher

[5]Bennett, Charles A., Baggette, F. L., Gerdes, F. L., Modernizing Cotton Gins, USDA, Farmers Bulletin No. 1802, 55 pp., illus., 1939.

for the sub-standard gins. The percentages being 38.1, 38.3 and 39.1 for the modern, average, and sub-standard gins, respectively. These percentages of lint turnout are significant since all gins having average staple lengths of less than one inch were excluded in order that the varieties involved would be almost in exact proportion for each gin group.[6] As a usual practice modern gins ginned with less dense seed rolls than did either the average or sub-standard gins.

Table 11. Lint percentage for cotton ginned in selected areas of Mississippi, crop of 1944, by type of gin establishment

Group	Samples classed	Lint percentage
Modern	27525	38.1
Average	29154	38.3
Sub-standard	12040	39.1

Age of Gins as a Factor Influencing Ginning Preparation

Since age and use bring about worn and outmoded machinery, a comparison of ginning preparation was made for gins built during the period 1937 through 1944 and for gins built prior to 1937, table 12. This grouping of gins was made without regard to whether the gins had been placed in modern, average, and sub-standard groups, but was made purely according to the age of the gins. However, about three-fourths of the gins shown were built during the period 1937 through 1944 and were from the modern group.

Age seems to have a definite influence on ginning preparation as the gins built during and since 1937 show only 4.9 percent rough preparation while those built prior to 1937 average 7.2 percent rough ginned cotton. The gins built since 1937 were assumed to have installed new equipment. Some of

Table 12. Age of gins as a factor influencing ginning preparation, in selected areas of Mississippi, crop of 1944

Period during which gin was built	Number gins	Samples classed	Samples reduced 1 or more grades	Rough preparation
			Bales	Percent
1937 to 1944	16	18014	876	4.9
Prior to 1937	57	50705	3634	7.2

[6]Bennett, Charles A. and Gerdes, Francis L., Effects of Feeds and Saw Speeds on Cotton Turn-out and Quality, USDA, Leaflet No. 151, 4 pp., illus., 1927.

the gins placed in the building prior to 1937 have been overhauled in recent years but are still considered to be inadequate in a number of respects.

Distribution of Gins According to Rough Preparation

Rough preparation for gins used in the study ranged from zero to about 21 percent. (Table 13.) Only two gins, however, had rough preparation in excess of 18 percent. These gins were in the sub-standard group. Approximately 90 percent of the modern gins were in that group having less than 9 percent rough preparation. The average and sub-standard groups each had 73 percent of the gins in this preparation range. Those gins having from 9 to 17.9 percent of rough preparation composed 10 percent, 27 percent, and 18 percent, respectively, of modern, average, and sub-standard gins.

Table 13. Distribution of gins in selected areas of Mississippi, according to the proportion of roughly ginned cotton, by type of gin establishment, crop of 1944

Gin group	Rough Preparation					
	0 to 8.9		9.0 to 17.9		18.0 and above	
	Number of gins	Percent	Number of gins	Percent	Number of gins	Percent
Modern	19	90	2	10	----	0
Average	22	73	8	27	----	0
Sub-standard	16	73	4	18	2	9

In order to compare the effect of condition of gin saws and ribs on ginning preparation, gins submitting samples from 50 percent or more of the bales ginned during the 1944 season, were divided into two groups according to condition of saws and ribs. Those gins having both saws and ribs in good condition had 5.4 percent rough preparation. Gins with either or both saws and ribs in fair to poor condition had 7.3 percent rough preparation.

The average value of lint per pound was 22.22 cents for the gins having saws and ribs in good condition and 22.13 cents per pound for gins having saws and ribs in fair to poor condition, table 14.

Table 14. Average value of lint and percentage of roughly ginned cotton as affected by conditions of gin saws and ribs at ginning establishments in selected areas of Mississippi, crop of 1944[1]

Condition of saws and ribs	Samples classed	Samples roughly ginned		Average value of lint per pound[2]
	Number	Number	Percent	Cents
Good	13694	739	5.4	22.22
Fair to poor	40310	2959	7.3	22.13

[1]Applies only to those gins submitting fifty percent or more of ginnings.
[2]Based on average premiums and discounts prevailing in the 10 designated spot markets, August 1944 through March 1945, staples 13/16 inch through 1-3/16 inches. Memphis premiums and discounts, for same period, were used for staples 1-1/8 inches and longer.

Grade index, average staple length and the proportion of rough preparation were determined for gins having overhead cleaners and those not having such cleaners. (Table 15.) The gins were divided without regard to their original grouping. Fifteen gins had overhead cleaners and 48 lacked this type of equipment. The advantages for overhead cleaners as here shown are almost nil.

Table 15. Grade index, average staple length and preparation of cotton ginned on gins equipped with overhead cleaners and not equipped with overhead cleaners in selected areas of Mississippi, crop of 1944

Item	Number gins	Bales ginned	Grade index[1]	Average staple length[2]	Rough preparation[3]	
					Bales	Percent
Gins equipped with overhead cleaners	15	12419	99.0	33.2	760	6.1
Gins not equipped with overhead cleaners	58	56300	98.9	33.3	3695	6.6

[1]Middling white is 100. Larger index numbers indicate higher grades.
[2]In 32nd inches.
[3]Samples reduced one or more grades because of rough preparation.

The gins using overhead cleaners produced a one-tenth of one percent higher grade index and five-tenths of a percent less roughly ginned cotton, than did gins having no overhead cleaners. The difference in average staple length for the two groups of gins was only one-tenth of one thirty-second inch.

Should the cotton growers in the areas of Mississippi covered by this study continue to pick their cotton by hand, it seems that driers could be more profitably used than overhead cleaners. (By overhead cleaners is meant auxiliary cleaners ahead

of the distributor and gin stands.) But should the trend toward mechanical harvesting of cotton continue, overhead cleaners are likely to become an essential part of the most complete ginning setup.

SUMMARY

Cotton is a raw product of the textile and other industries and consequently has to compete with other fibers that can be substituted for cotton at the point of entry into these industries. In this competitive process, the product that is of the highest quality and can be had at the lowest price will be in greatest demand.

The cotton gin plays an important part in preparing and conditioning cotton for its place in the competitive picture. This study was designed to show the influence of the type and condition of gin machinery and equipment on the cost and efficiency of operating gins as well as the grade of the ginned lint.

Complete cost and grade information was obtained from 50 gins in 4 counties in central Mississippi and 42 gins in 4 counties in north Mississippi. On the basis of detailed appraisal information, all gins were grouped according to whether they were modern, average, or sub-standard in the type and condition of gin machinery and equipment.

The 92 gins handled a total of 122,647 bales during the 1944 season, or an average of 1,333 bales per gin. The 23 modern gins had an average volume of 1,926 bales per gin as compared to an average of 960 for the 30 sub-standard gins. The average age of the modern gins was 8 years as compared to an average of 18 years for the sub-standard group. The estimated replacement value of the 92 gins is slightly under 2 million dollars or an average of $21,703 per gin. The present value, however, averaged only $11,948 or 55 percent of the replacement value.

After allowing for all current expenses, salary for management, depreciation, and interest on the investment, the average gin in 1944 returned a net profit of $491 on the ginning operation. For the modern gins the profit was $1,227 and for the sub-standard group the average was only $7.00. In addition,

all ginners had the profit from the handling of cottonseed and bagging and ties which amounted to an average of $1,893 and $317 respectively. When all items were included, the modern gins had a total net profit of $4,327 and the sub-standard gins a profit of $1,497.

The average cost of ginning a bale of cotton was $3.10. The average gin income was $3.46 per bale, thus leaving a net profit of $0.36 per bale. The net profit from the handling of seed and bagging and ties increased the average total net profit to $1.96 per bale for the 1944 season. The range in total net profit was from an average of $2.25 per bale for modern gins to $1.46 per bale for sub-standard gins.

It required an average of 2.9 hours of man labor to gin each bale of cotton. The 40 gins that used Diesel engines as a source of power used an average of 1.6 gallons of Diesel fuel per bale. Electrically powered gins used 19 kilowatt hours of electricity for each bale. Ten other fuel burners used 3.3 gallons of tractor fuel or fuel oil per bale while 9 gasoline powered gins used 3.1 gallons of gasoline for each bale.

The major factors that influenced ginning income were size and volume, use of labor and power, and the use of capital. All sizes of gins that had large volumes and made efficient use of their labor, power, and capital returned a reasonable net profit. As usual, efficient large gins with a large volume returned a larger profit than smaller gins. To insure enough income to at least break even, small 2-stand gins needed about 500 bales per gin stand, 3-stand gins at least 450 bales per stand and 4-stand gins at least 400 bales per stand. However, this volume alone did not insure the financial success of every individual gin, but volume plus the efficient use of labor, power and capital, almost always insured the financial success of the ginning operation.

Cotton driers have a decided effect on ginning preparation. Those gins using driers had 3.7 percent rough preparation as compared with 6.8 percent rough preparation for gins not having driers.

Little difference existed in the density of seed rolls maintained by the various groups of gins. However, those gins us-

ing tight seed rolls were all in the average and sub-standard groups. Modern gins maintained considerably higher saw speeds than did either the average or sub-standard groups. Saws and ribs on the modern gins were in good to fair condition, while several of the average and sub-standard gins had saws and ribs in poor condition.

Gins built during the period, 1937 to 1944, had 4.9 of their samples reduced one or more grades. But, gins built prior to 1937 had 7.2 percent of their samples reduced one or more grades because of rough ginning. Age of gin, therefore, seems to have had considerable influence on the quality of cotton turned out.

The average value of lint turned out by gins having both saws and ribs in good condition was 22.22 cents per pound. That turned out by gins having either or both saws and ribs in fair to poor condition had an average of 22.13 cents per pound.