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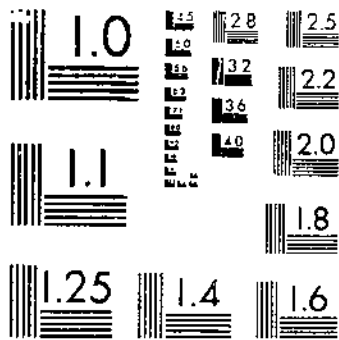
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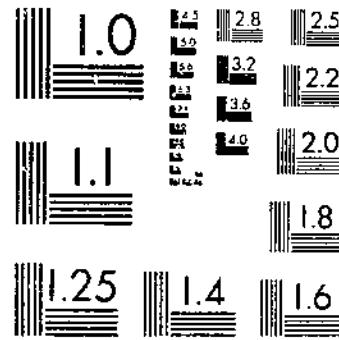
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PRACTICES AND COSTS OF COTTON-GIN OPERATION IN NORTH-CENTRAL TEXAS, 1924 1924
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UNITED STATES DEPARTMENT OF AGRICULTURE
WASHINGTON, D. C.

PRACTICES AND COSTS OF COTTON-GIN OPERATION IN NORTH-CENTRAL TEXAS, 1924-25

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Economic information regarding the ginning industry is very limited. The entire industry has grown up in response to certain well-known demands and without much conscious planning and direction. Many times a large crop of cotton has been sufficient to encourage the building of additional gin plants that were not required under normal conditions. Originally, ginning was a plantation enterprise and the grower personally supervised the preparation of the cotton for market. With the passing of the plantation system and the advent of improved ginning machinery, efficient power plants, good roads, and a realization of the advantages of large-scale opera-

¹Acknowledgment is made to the many ginners who furnished data and whose cooperation was necessary to this study, and to the manufacturers of cotton-ginning machinery for their cooperation. Much credit is due H. E. Buchanan, Assistant in Market Business Practice, who assisted in the collection and tabulation of data, and Christine Beard, who assisted in all the statistical work.

tions, the plantation gin has rapidly disappeared. To-day it is practically extinct and has been replaced by custom gins.

The cotton gin performs certain functions and services which are indispensable in the marketing of cotton. It is of interest to the gin operator, therefore, as well as to the producer and consumer, that the most efficient methods and practices be followed in gin operation.

In undertaking this economic analysis of the practices and costs of cotton-gin operation, an effort was made to determine the factors that influence ginning costs. In any business, costs should be known to the individual engaged therein, that he may more intelligently influence the charge or price for the service he renders. Furthermore, should his costs be higher than the costs of his competitors, a thorough knowledge of the various cost factors is essential to a prompt adjustment of his business to a more efficient level. Costs are relative, and without a comparative cost analysis it is difficult for an individual to know whether his costs are high or low in relation to those of the group of which he is a member.

As new methods and practices are developed, and more and more men in an industry observe and practice efficient methods, a greater share of the savings effected may be passed on to the consumer. In the case of cotton ginning, if costs can be materially reduced, then unquestionably, ginning charges may be lowered, and both the grower and ginner would profit thereby.

Some businesses in every industry are more efficiently operated than others. This condition has been revealed frequently by Federal and State agencies in analyses of businesses of different types. A comparative-cost analysis makes it possible to learn the strong and weak points of an organization. Business concerns learn from each other in much the same way as individuals learn from other individuals. A well-organized and successful business organization has practices and policies that less successful ones might well emulate. A study of groups of comparable businesses also reveals certain determining factors and characteristics that are worth noting.

PURPOSE OF THE STUDY

Briefly, the purpose of this study of practices and costs of cotton-gin operation was to ascertain the economic condition of the ginning industry. This was done by collecting at first hand and analyzing cost and practice information (1) to ascertain the kind and quality of services rendered, and (2) to determine the factors influencing efficiency in gin operation which, when applied, should result in a reduction of waste in the industry.

RESULTS OF THE STUDY

The principal factors considered in this study and the results obtained are presented here in summarized form. More detailed discussions will be found in succeeding sections.

The number of gin plants in the United States declined from 28,358 in 1912 to 18,262 in 1925, a decrease of 35.6 per cent. With this numerical decline there has been a more or less corresponding increase in the size of plants. In 1906 more than 50 per cent of the gin plants in the United States had less than 100 saws each;

in 1919 less than 25 per cent were of this size. Apparently, the ginning industry is rapidly undergoing consolidation.

The custom-ginning business, with large gin plants, has been developed to a greater extent in the Southwest than in some other sections of the country. Each active ginning plant in the United States turned out a yearly average of 642 bales of cotton from 1914 to 1925, inclusive, whereas each active plant in Texas turned out 963 bales.

The charge for ginning cotton in Texas is based on the hundred-weight of seed cotton, exclusive of bagging and ties, and ranges for different localities from 30 to 40 cents for picked cotton and from 40 to 50 cents for "bollies." The usual charge for bagging and ties is \$1.50 per bale.

It is a common practice for the grower to sell his seed to the gin-ner and pay his ginning charges by the transaction. On the average, in the area studied, ginners purchased about 75 per cent of the seed ginned.

The period of gin operation varies with the size of the cotton crop and the condition of the weather. As a rule, it lasts 125 to 150 days.

A ginning business usually has the following divisions: (1) Custom ginning, (2) the purchase and sale of bagging and ties, (3) the purchase and sale of seed, (4) the purchase of seed cotton remnants and the subsequent sale of the ginned products thereof, and sometimes (5) the purchase and sale of baled cotton.

Volume is a major factor in determining the cost of ginning. In the area covered in this study, plants with a volume of 1,000 to 1,500 bales had an average cost² of \$6.97 per bale in 1924-25, whereas plants with a volume of 3,000 to 3,500 bales had an average cost of \$4.58. (Table 8.)

When costs are calculated on the basis of size of plant, the figures show that 4-stand plants ginned on the average 22,090 hundred-weight of seed cotton (about 1,500 bales) at a cost of 42.5 cents per hundredweight; 5-stand plants ginned an average of 27,176 hundred-weight (about 1,900 bales) at an average cost of 37.6 cents; and 8 and 10-stand plants ginned an average of 38,767 hundredweight (about 2,600 bales) at an average cost of 37.9 cents. (Tables 11, 12, and 13.)

The average operating fuel costs for three kinds of power plants were: (1) For 6 oil-engine plants, 22.9 cents per bale; (2) for 37 steam plants, 66.4 cents per bale; and (3) for 22 electric plants, 94.7 cents per bale. (Table 15.)

The cost of labor per bale for oil-engine plants was \$1.48, for steam plants \$1.50, and for electric plants \$1.23. The corresponding total costs per bale were \$6.01, \$5.71, and \$5.51, respectively, and the average quantities ginned per gin, 1,455, 1,542, and 1,733 bales. (Table 15.) These variations in quantity no doubt influence the variations in total costs.

Itemized costs expressed as a percentage of total costs were as follows: Management, 13.24 per cent; labor, 24.66 per cent; power, 12.77 per cent; insurance, 6.50 per cent; taxes, 1.94 per cent; office expense, 1.44 per cent; maintenance, 21.48 per cent; interest on investment, 15.73 per cent; and other expense, 2.24 per cent. (Table 19.)

² See footnote 1, Table 8, page 24.

When custom ginning was treated singly the plants studied failed by 0.7 per cent to make a return of 6 per cent on the capital invested. (Table 22.) Thirty-eight plants failed to make 6 per cent, whereas 28 plants made more than a 6 per cent return on custom ginning. A higher percentage of 4-stand plants failed than of 5-stand or double-battery plants.

A study of the seed business shows that the gins studied received an average net return, after paying drayage, of \$2.65 per ton sold, which is equivalent to a profit of 91 cents per custom bale ginned. (Table 25.)

An average net return of 33.8 cents was realized on each pattern of bagging and ties sold. (Table 26.)

An average return, after paying all expenses, of 27 cents was realized for each hundredweight of seed cotton and bollies bought. (Table 27.)

The 20 plants buying and selling baled cotton incurred an average net loss of \$1.08 per bale. (Table 28.)

For all departments an average total profit of 8.68 per cent of the capital invested, in addition to an allowance of 6 per cent for interest on investment, was made by 53 plants from custom ginning, the seed business, bagging and ties, and seed cotton. (Table 29.) Eleven plants out of a total of 66 (16 $\frac{2}{3}$ per cent) failed to make a 6 per cent return on capital when all their operations were considered.

The average capital investment per bale ginned for 53 plants was \$14.78, or about two and one-half times the charge for ginning a bale of cotton.

THE GINNING INDUSTRY

The scope and character of the industry as a whole and the changes that are taking place within it deserve consideration in this study, for they have a direct influence on the operation and management of ginning businesses.

The ginning industry covers the cotton-producing area of the United States, for almost every town, hamlet, and crossroads has a cotton gin. The gin is as indispensable to the cotton trade as the thresher is to the grain trade. It is estimated that the total investment in cotton-ginning plants in the United States is probably in excess of \$200,000,000, and that the cost to the American cotton growers for ginning and wrapping the 1925 crop amounted to approximately \$100,000,000, or about \$6 per bale. According to estimates of the Census Bureau the ginning facilities of the United States, in the aggregate, are sufficient to gin the entire American cotton crop in 30 days.

Ginning is the first machine process that cotton must pass through on its journey from the field to the fabric. The seed must be separated from the lint before either is of much commercial importance. In addition to this separation, gin service includes the pressing and wrapping of the bale of lint. The grower judges the quality of his gin service on the following bases: (1) Good sample, (2) high percentage of lint turnout, (3) prompt service, and (4) reasonable charge. It should be the business of every ginner to satisfy these demands.

In many parts of the Southwest, the service demanded of the gin has been increased materially in the last few years by the manner

in which the cotton is now harvested. A considerable quantity of the crop is no longer picked as in the Southeast, but the open bolls are "pulled" or "gathered." This class of seed cotton is usually referred to as "snaps." If the boll is struck by frost when it is partly open and this cotton is gathered and ginned it is referred to as "bollies."

Another method of harvesting that has been recently introduced is known as "sledding." By this method, the entire plant is stripped of its branches and fruit at one operation.

Bollies are less desirable than snaps because of the excessive leaf and other foreign matter and the high relative percentage of immature fiber. The trade distinguishes sharply between "early snaps" and bollies. The practices of "snapping" and sledding cotton have been developed because of the scarcity of labor and the high cost of picking cotton carefully. A much larger quantity of cotton can be gathered than can be picked in a day. Many different types of bolly machines have been devised and manufactured to separate cotton and burs. The ginner's operating cost is increased because of performing this additional service, and as a result a higher rate is charged for ginning snaps, bollies, and sledded cotton than for picked cotton.

NUMBER OF GIN PLANTS IN THE UNITED STATES

There were 18,262^a gin plants in the United States in 1925. Of this number 15,482 were active during the 1925-26 season, and 2,780 were idle. Plants are idle usually because of a crop failure in the community or because of pending dismantlement. Table 1 shows that the total number of gin plants has declined 35.6 per cent in the years 1912 to 1925, or at an average rate of decrease of 2.7 per cent per year. Every year of the 13 shows a substantial decrease from the preceding year. From 1913 to 1914 the decrease was smallest, being 1.1 per cent, and from 1916 to 1917 it was largest, being 6.8 per cent.

TABLE 1.—Total number of gin plants in the United States, 1912-1925

Year beginning Aug. 1—	Number of gin plants *	Decrease from the preceding year	Percentage decrease from the preceding year
1912.....	28,358		
1913.....	27,649	709	2.5
1914.....	27,339	310	1.1
1915.....	26,721	618	2.3
1916.....	25,960	722	2.7
1917.....	24,226	1,734	6.8
1918.....	23,439	787	3.2
1919.....	22,418	1,021	4.4
1920.....	21,870	542	2.4
1921.....	20,938	938	4.3
1922.....	19,937	1,001	4.8
1923.....	19,189	749	3.8
1924.....	18,636	553	2.9
1925.....	18,262	374	2.0
Decrease 1912-1925.....		10,096	35.6
Average annual decrease.....		776.6	2.7

* Data are from bulletins of the Bureau of the Census.

^a All data relative to the number and size of gin plants, except those collected by the writer in the area studied, are from publications of the Census Bureau.

The number of active and idle plants in the United States for the years 1912 to 1925 is shown in Figure 1. The decline in number of plants has been marked, but it has been accompanied by a small increase in the total capacity of active plants. In 1906, according to census statistics, the total number of saws was 3,597,400, and in 1919, the latest date for which statistics are available, the number was 3,721,925.

Larger and more efficient plants are displacing the small and inefficient ones. The development of good roads and faster modes of transportation is making it possible for a centrally located plant to serve a much larger number of customers than formerly, particularly in the Southeast, where not long ago plantation gins were common. Plantation gins are rapidly passing because of the breaking up of large plantations and the introduction of the more economical system of large-scale ginning.

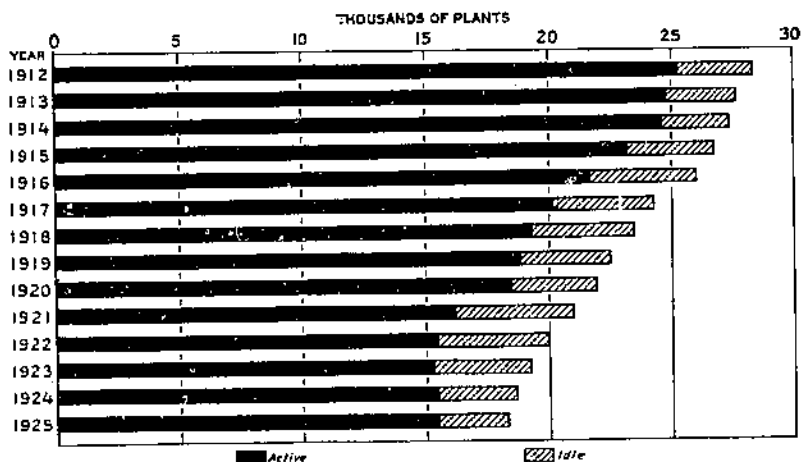


FIG. 1.—TOTAL GIN PLANTS IN THE UNITED STATES, 1912-1925

The decrease in number of establishments has been compensated for, in large measure, by the increase in size of plants, as shown in Table 2.

The prosperity of the ginning industry is directly dependent upon successful cotton production. In many sections of the South the invasion of the boll weevil has no doubt brought about a decided reduction in the number of gin plants. Cotton production has been almost discontinued in many communities, and in others diversification is practiced to a much greater extent than formerly. These production changes have naturally caused an adjustment in the ginning industry.

The number of plants, active and idle, for the various cotton-producing States for 1912 and for 1925 is shown in Figure 2. There has been a substantial decrease in number of plants in practically every State. Three States show decreases of approximately 50 per cent for the 13-year period—Georgia, Alabama, and Mississippi. Arkansas, North Carolina, South Carolina, and Louisiana show net losses of one-third or more, Texas about one-eighth, and Oklahoma one-tenth. The less rapid decrease in Texas and Oklahoma is probably due to the establishment of new gins in the new producing areas of those States.

SIZE OF GIN PLANTS

The Census Bureau has collected statistics on the number of gin plants, by sizes, for the years 1906, 1909, 1914, and 1919. An analysis of these data for the United States as a whole shows that, in 1906, 80.19 per cent of the plants had less than 200 saws. (Table 2.) In 1919 this figure had decreased to 53.14 per cent. The corresponding figures for Texas are 48.11 per cent and 16.16 per cent. Thus, Table 2 shows that plants with less than 200 saws have been going out of business rapidly, whereas those with more than 200 saws have been growing more numerous.

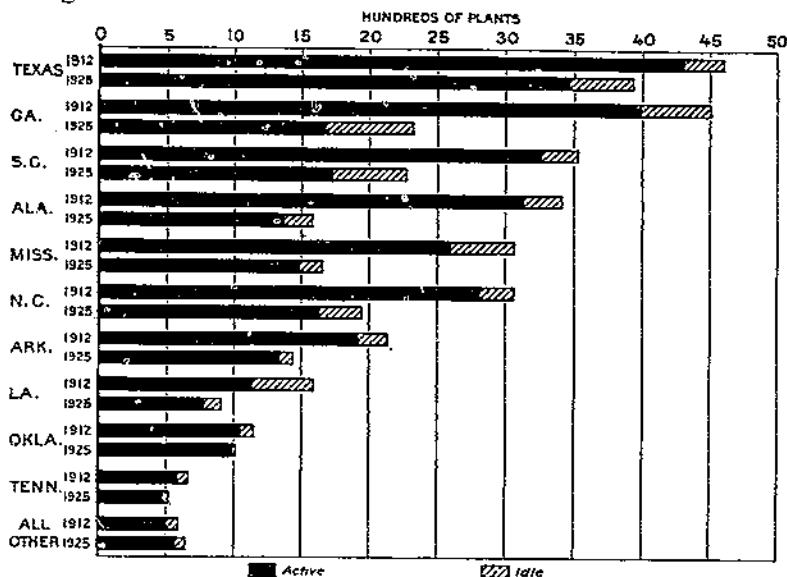


FIG. 2.—GIN PLANTS IN THE UNITED STATES, BY STATES, 1912 AND 1925

There was a marked decrease in number of cotton-gin plants throughout the Cotton Belt during this period.

TABLE 2.—Percentage of gin plants in the United States and in Texas, by number of saws, 1906-1919

(Data are from bulletins of the Bureau of the Census)

Year beginning Aug. 1—	Less than 50 saws		50 to 74 saws		75 to 99 saws		100 to 199 saws		200 to 499 saws		500 or more saws	
	Per-centage of United States total	Per-centage of Texas total	Per-centage of United States total	Per-centage of Texas total	Per-centage of United States total	Per-centage of Texas total	Per-centage of United States total	Per-centage of Texas total	Per-centage of United States total	Per-centage of Texas total	Per-centage of United States total	Per-centage of Texas total
1906.....	3.02	0.24	41.83	14.63	5.32	1.32	20.12	31.92	18.03	48.05	1.18	3.24
1909.....	2.69	.27	36.80	11.89	4.64	.98	31.27	26.99	22.77	54.57	1.73	5.35
1914.....	1.27	.16	26.69	4.72	4.16	.73	31.74	20.73	32.74	65.45	3.10	8.21
1919.....	.98	.06	19.04	1.66	3.33	.36	30.09	14.18	42.96	74.96	3.90	8.88

THE INDUSTRY IN TEXAS

More than 20 per cent of the gin plants in the United States are within the State of Texas. In 1912 there were in Texas 4,607 plants, and by 1925 this number had been reduced to 3,923. The low point was reached in 1922, for in that year only 3,772 were reported. (Fig. 3.)

From 1913 each succeeding year witnessed a small decrease until 1923, since when there has been a small increase each year because of the opening up of more and more cotton land in the western and northwestern parts of the State. New gin plants have been erected to care for this expansion in cotton territory.

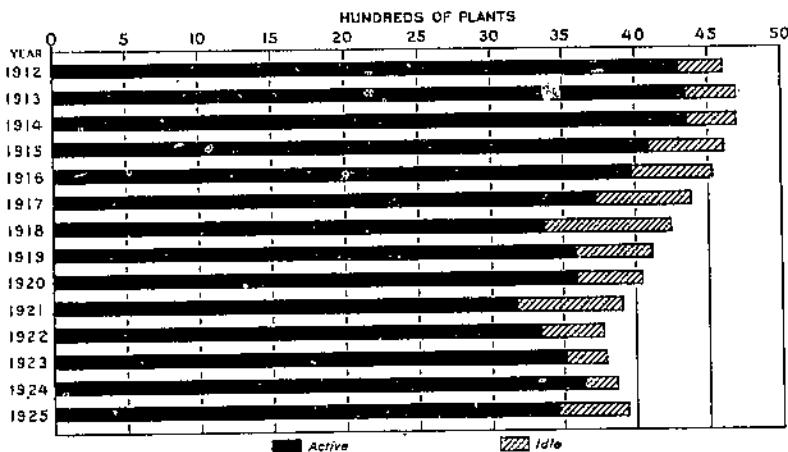


FIG. 3.—TOTAL GIN PLANTS IN TEXAS, 1912-1925

Total number of gin plants in Texas, active and idle, 1912 to 1925, inclusive. The decrease in number of gin plants has not been as marked as in other States, principally because of the establishment of gins in new producing areas.

TABLE 3.—Cotton production in Texas and in Ellis and Dallas Counties, Tex., 1914-1925

[Data are from bulletins of the Bureau of the Census]

Year beginning Aug. 1—	Texas	Ellis County	Dallas County
	Running bales	Running bales	Running bales
1914	4,390,200	135,913	64,785
1915	3,068,852	111,304	41,379
1916	3,562,789	118,247	57,666
1917	3,041,725	105,471	67,262
1918	2,610,337	91,258	51,016
1919	2,960,335	93,753	37,355
1920	4,148,399	146,760	44,326
1921	2,129,660	78,457	29,512
1922	3,125,758	82,290	39,898
1923	4,212,248	112,711	53,940
1924	4,350,056	122,241	65,061
1925	4,098,249	78,182	62,144
Average	3,516,626	103,880	51,190
Percentage of total Texas crop		2.95	1.45

The comparative trend of cotton production in Texas as a whole, and in Dallas and Ellis Counties, for the years 1914 to 1925 is

shown in Table 3. For each of the three years, 1923 to 1925, Texas has produced more than 4,000,000 bales. The two counties shown have been consistent heavy producers and on an average produce about 4½ per cent of the Texas crop. Dallas County had 10 plants less in 1925 than in 1914, and Ellis County had 8 less in 1925 than in 1914. The percentages of decrease in these two counties were 19.2 and 10 per cent, respectively. (Table 4.)

TABLE 4.—Number of gin plants in Dallas and Ellis Counties, Tex., 1914-1925
[Data are from bulletins of the Bureau of the Census]

Year beginning Aug. 1—	Gin plants in Dallas County			Gin plants in Ellis County		
	Active	Idle	Total	Active	Idle	Total
1914.....	48	4	52	78	2	80
1915.....	49	4	53	77	2	79
1916.....	49	4	53	78	2	80
1917.....	48	1	49	79	2	81
1918.....	46	2	48	76	5	81
1919.....	45	3	48	77	5	82
1920.....	44	4	48	74	8	82
1921.....	39	6	45	71	8	79
1922.....	42	3	45	67	8	75
1923.....	41	3	44	69	5	74
1924.....	39	2	41	69	2	71
1925.....	42	0	42	68	4	72

The average number of bales per active plant is higher in Texas than for the United States as a whole. This has been invariably true since 1914. For the last 12 years each active plant in the United States has turned out a yearly average of 642 bales; each active plant in Texas has turned out 963 bales; each active plant in Dallas County, Tex., has turned out 1,155 bales, and each in Ellis County, Tex., 1,412 bales. Table 5 gives this comparison for the years 1914-1925:

TABLE 5.—Comparison of the average number of bales ginned per active plant in the United States, Texas, and Ellis and Dallas Counties, Tex., 1914-1925

[Data are from bulletins of the Bureau of the Census]

Year beginning Aug. 1—	Average number of bales ginned per active plant in—			
	United States	Texas	Dallas County	Ellis County
	<i>Running bales</i>	<i>Running bales</i>	<i>Running bales</i>	<i>Running bales</i>
1914.....	618	1,007	1,350	1,742
1915.....	478	750	844	1,440
1916.....	526	897	1,177	1,516
1917.....	554	817	1,401	1,335
1918.....	618	776	1,109	1,201
1919.....	602	820	830	828
1920.....	720	1,155	1,007	1,583
1921.....	493	671	757	1,105
1922.....	631	936	950	1,228
1923.....	605	1,200	1,314	1,634
1924.....	882	1,328	1,668	1,772
1925.....	1,043	1,185	1,477	1,164
Average ²	642	963	1,155	1,412

¹The Texas crop for each of these years exceeded 4,000,000 running bales. In each case the average number of bales ginned per active plant was more than a thousand.

²Averages are weighted by the number of active plants over the period of 12 years.

In 1906, 48 per cent of the gins in Texas were plants having less than 200 saws, whereas in 1919 this percentage was reduced to about 16. (Table 2.) The corresponding figures for the entire country were 80 and 53 per cent, respectively. In all probability Texas never did have a high percentage of small gin plants. Cotton production there began later than in the Southeastern States, the old plantation system of the South did not develop, and custom ginning was practiced rather generally from the first. Consequently, gins were more centrally located, larger plants were built, and subsequent developments have tended to perpetuate this situation.

GIN LAWS IN TEXAS⁴

Every ginner doing a custom-ginning business in Texas is declared by statute to be a public ginner. All public gimmers are required to obtain a license from the State commissioner of warehouses prior to beginning operation and to file a surety bond with the said commissioner. The amount of the bond required is stated to be not less than \$250 and not more than \$1,000 for each plant operated. Both licenses and bonds must be renewed annually, the former upon the payment of a fee of \$1 and the latter at a cost of about \$3.50. Suits may be instituted by owners of cotton that is damaged while in the possession of the gin in any court of competent jurisdiction in the name of the aggrieved party without the necessity of binding the State in the suit; but venue of the suit shall be subject to the general venue statutes of the State. Recovery may be had upon said bond until the amount thereof has been used up; then the maker thereof shall be required to give a new bond, or make good the impairment; otherwise license as a public ginner is subject to cancellation.

Each bale of cotton ginned by a licensed and bonded ginner shall be so wrapped that the bale will be completely covered when compressed; provided that the ends of the bale shall be closed and well sewed; and provided further, that the quality of the bagging shall at all times be such that marking thereon will, under ordinary conditions, remain intact and visible. Each licensed and bonded ginner shall mark each bale of cotton ginned by him with a metal tag or marker of some indestructible material on which shall be stamped in distinct letters the number of the bale as recorded on the ginner's books and the number of the gin license.

METHOD OF STUDY

Since practically no information was available regarding ginning costs it was apparent from the beginning that this study would have to be based largely on data obtained directly from gimmers. To expedite the collection of an adequate and satisfactory sample of ginning information, it was decided to choose a small but representative area of north-central Texas in which to work. This careful selection of a relatively small area not only facilitated the taking of records but increased the chances of finding comparable ginning conditions so that the conclusions drawn from the data obtained and analyzed are likely to be more reliable.

⁴ For complete articles in civil and penal codes relating to ginning see Appendix D, page 55.

The selected area is based somewhat on county lines since the county is a unit on which available gin statistics are given. Dallas and Ellis Counties form the major part of the area surveyed, though a few gins from adjoining counties are included in the sample. These counties are important cotton-producing areas, located in the north-central part of the State, forming a part of what is known as the "black lands." (Fig. 4.) The black-lands section extends north and south throughout the central part of the State and produces approximately 40 per cent of the State's cotton crop. Production and

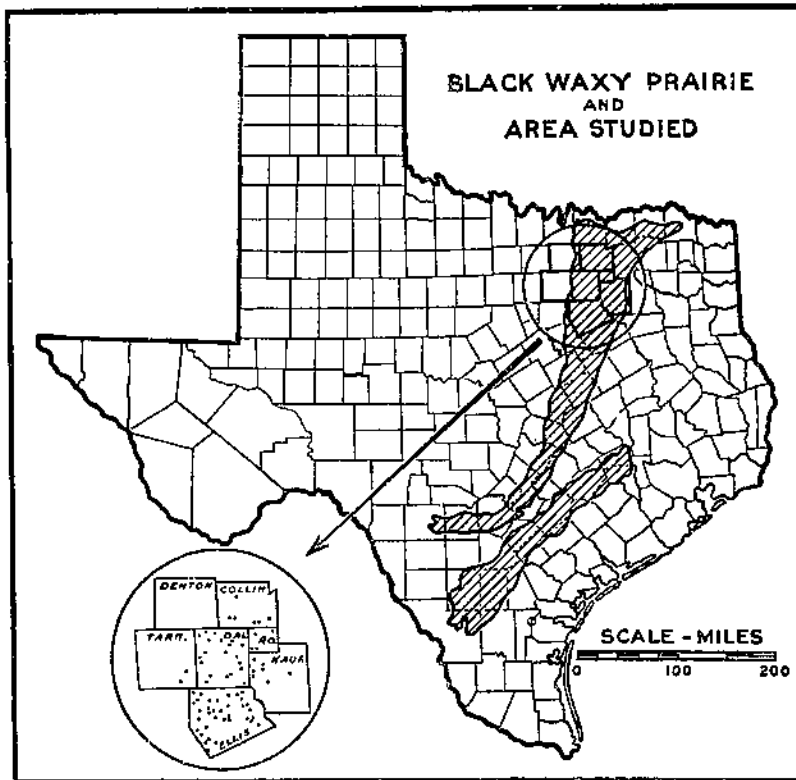


FIG. 4.—The part of the "black lands" of Texas covered by the survey is shown in the insert. The approximate location of the gins studied is indicated by dots. Each dot represents one gin.

ginning conditions in this territory are fairly comparable, and the results of an investigation in a part of it should have partial application to the entire section.

The selection of the sample or group of gins for detailed study was purposely haphazard. Nothing was known about any of the gins prior to visiting them except the name of the operator and the business address. No information was available relative to the size of the plant or the volume of business the preceding year. Records were taken of gins visited wherever either written or verbal information was available, and no plants were omitted in order to weight the sample in any way. Both country and town gins were included,

and line⁵ and independent gins in about the same proportion that each type exists in the area studied. In all 74 ginning businesses were covered in the study, embracing 51 per cent of the active gins of the two counties surveyed and representing 58 per cent of the total bales ginned in the two counties.

COTTON-GINNING PRACTICES

LOCATION OF GINS

Ginning and marketing are so closely related that a good gin site is almost invariably found near a cotton market, and as a result most gins are located in small towns that have cotton buyers. Bales of cotton are usually moved directly from the gin to the market; consequently the gin located near a good market usually is favored by the grower. Country gins often establish a cotton market by buying baled cotton to attract gin patronage, and gins sometimes do the same thing as a competitive measure. As a rule, growers will have their cotton ginned where they can sell the bale to best advantage. The cotton gin is usually a part of the trading center, and a trip to the gin often serves a manifold purpose—the cotton is ginned and sold, groceries and farm supplies are purchased, debts are paid, and other business transacted.

It is not unusual to find as many as four or five large-capacity gins in an important trading center. Cotton is brought in from a distance of 8 to 10 miles. The average gin community, however, was found to be about 4 to 5 miles in radius, the shape of the territory served depending upon the geography and roads of the section.

GENERAL PLANT LAYOUT

Most gin plants consist of a gin house, a power house, which is generally attached to, or partitioned off from, the gin house, a seed house, a cotton house, and an office or scale house. (Fig. 5.) Arrangement of the buildings varies in individual plants, but not a great deal. The layout in most instances is the one recommended by the manufacturer of ginning machinery, and this no doubt explains the similarity of individual plants. Most modern plants are conveniently and economically planned. (Fig. 6.)

Two general types of gin houses are in common use—one-story and two-story houses. Each type undoubtedly has certain advantages. Most of the more recently constructed plants seem to be of the one-story plan. Of 43 plants visited, 24 were one-story and 19 two-story. One-story plants usually have concrete floors. This reduces the fire hazard and there is less vibration, resulting in less wear, tear, and friction than in the case of the average two-story plant.

The modern gin house is of what is known as ironclad construction; both roof and sides are of galvanized iron. The other buildings almost invariably have metal roofs, but the seed house and office are usually of frame construction otherwise. The cotton house is usually ironclad.

⁵ The term "line" is used to differentiate ownership of gins and refers to gins operated as units of a system embracing several plants. "Independent" gins, on the other hand, are owned and managed as separate concerns.

GINNING SYSTEMS

Both brush and air-blast ginning systems are in use in this area. Of 44 plants visited, 31 were brush and 14 air blast. The air-blast system is a comparatively recent development and for this reason a smaller percentage of plants in operation to-day would be expected to have it. Normal weather conditions which influence the condition of the cotton to be ginned and individual ginner preferences are important factors in the selection of ginning systems.

The speed of gin saws depends on the type of ginning machinery. Brush systems usually operate with a medium-hard seed roll into

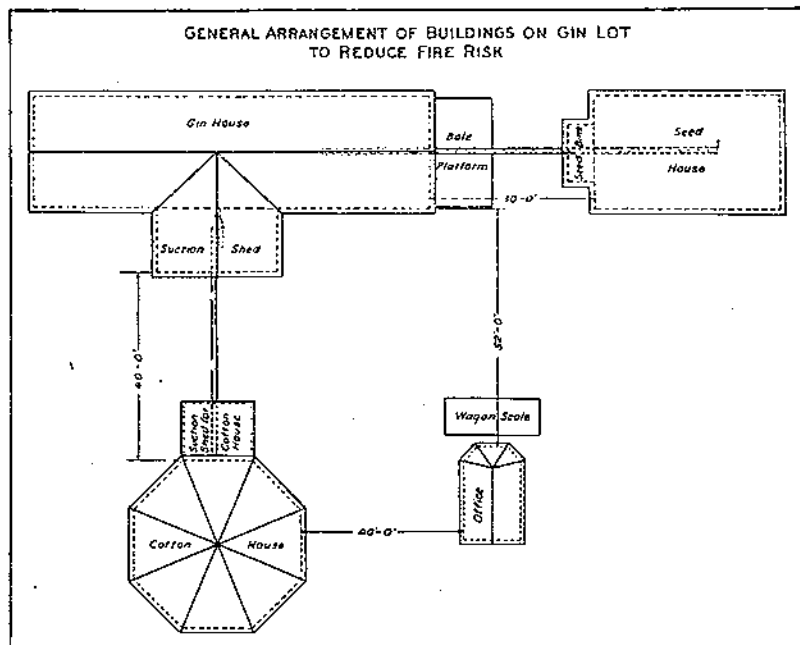


FIG. 5.—General arrangement of buildings on gin lot to reduce fire risk. Fire hazard in cotton gin operation is very great, resulting in high insurance costs. It is important, therefore, in building a plant to observe those distances between buildings that reduce the fire risk to a minimum.

which the saws are driven at a speed of 350 to 450 revolutions per minute. Air-blast systems use a soft or loose seed roll and run at a much higher speed, usually 500 to 700 revolutions per minute. Usually the speed of both systems is kept fairly constant during operation—the speed is not changed for damp cotton nor for staple of unusual length. In answer to a question on this subject, practically all ginner replied that they vary the feed but never the speed when damp or wet cotton is encountered.

A question relative to complaints received about gin-cut cotton was asked each ginner visited and the almost unanimous answer was that they have no complaints except when cotton is ginned damp, which is always done at the owner's risk.

GIN LABOR REQUIREMENTS

In addition to the manager, the usual crew of a 4 or 5 stand gin plant consists of a weigher or bookkeeper, a ginner, two pressmen, a suction man, and an engineer. If the capacity is doubled, making it a double-battery plant, the crew, with the exception of the bookkeeper and perhaps the engineer, is doubled. If electric power is used, one man may be dispensed with. Many single-battery gins use two suction men, particularly during the peak season when a considerable quantity of seed cotton is unloaded into the seed-cotton house. Automatic press trampers make it possible to economize in man power at the press. Two men are required to "tie out" a bale, but the second man may devote most of his time to general duties as utility man.

The ginning day is a 12-hour day. During the peak period it often becomes a 15 to 18 hour day, and many times a night crew is put on, and the plant runs the entire night. In the area studied white labor is almost invariably used. One or two cases were noted where compensation was made for piecework. This was for press-

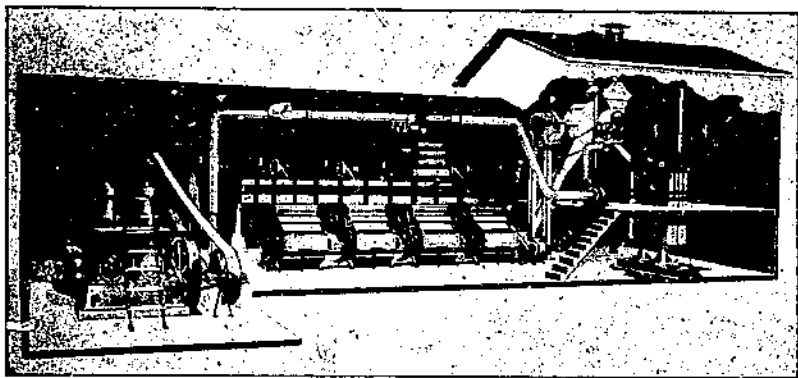


FIG. 6.—A complete modern 4-stand air-blast oil-engine-driven gin plant. In many sections of the Cotton Belt special cleaning equipment is added.

men who contracted to "tie out" bales at so much per bale. All other labor was paid on an hour or day basis.

CHARACTER OF GIN MANAGEMENT

DUTIES OF MANAGERS

The duties of gin managers vary widely, depending upon the size of plant and the number of enterprises engaged in. Managers of plants with small volumes of business are laborers as well as managers. The manager may serve as ginner and manager, or he may be weigher and manager; the latter combination of duties is not unusual. Large plants employ more men, and there is less overlapping of duties—the manager in such cases is principally a director and supervisor. He has time for making contacts with his customers; he looks after the buying, selling, and shipping of seed, and if baled cotton is bought a considerable amount of his time is required for it. There are hundreds of pressing matters during the peak period to demand his attention. The job of seeing that the machinery is running smoothly and being able to act quickly and intelligently in case of a breakdown is no mean responsibility.

PERIOD OF EMPLOYMENT

The period of employment of gin managers varies greatly. In large plants the manager is usually employed for 12 months. For about half of this time he is busy with actual gin management; during the other half he is more or less at leisure, spending his time in maintaining and developing his custom business by constant contacts with the cotton producers of his community. Managers of small plants are employed for only six or eight months.

RELATED INTERESTS

A number of gin managers handle cottonseed for planting. All gin managers are more or less closely allied with farming interests. Many of them are actively engaged in cotton production, and others own farms and supervise their operation. Twenty-six out of the 41 gin managers gave farming as their other business, 2 were carpenters, 1 was a banker, 1 a mechanic, 1 a cotton merchant, and 10 had no other business.

In the line gins^a a good share of the management is centered in the home office. The local manager becomes more of a superintendent. All decisions pertaining to the purchase and sale of cottonseed, baled cotton, etc., are made by the general manager, who is in constant touch with general market conditions. The local manager is an agent of the line-gin company and is kept constantly informed regarding the proper course to pursue by telephone or by visits of the general manager.

EDUCATION, EXPERIENCE, AND AGE OF GIN MANAGERS

A study of the education and experience of 41 gin managers for whom data are available revealed that 5 were college men, 18 had more or less high-school education, and 18 had had less than high-school training. In ginning experience 7 of the 40 reporting had had less than 10 years, 16 had had 10 to 20 years, 13, 20 to 30 years, and 4, more than 30 years' experience in cotton ginning. A study of the ages of 41 gin managers showed the following: None was less than 30 years of age, 7 were between 30 and 40, 16 were between 40 and 50, 12 were between 50 and 60, and 6 were more than 60 years of age.

PERIOD OF GIN OPERATION

Ginning begins and ends with the picking season. As the picking season opens, an occasional wagonload of cotton begins to find its way to the gin, and as the season progresses the ginning operations become more and more regular until, in many instances, both day and night shifts are employed to take care of the custom work. The season closes in much the same way. Toward the end wagons appear very irregularly, so "gin days" are set, and cotton is ginned only or one or two days in each week.

Weather conditions during the picking season are a big factor in efficient cotton-gin operation. The more favorable the weather for

^a See footnote 5.

maturing the crop and picking it the more regular the employment of the gin crew and plant facilities. These conditions vary widely from season to season. Ginning usually begins during the period from August 15 to September 1 in this area and ends about February 1.

At most, the average gin plant is utilized about 150 days⁷ during the year, including the annual repair period. There are perhaps very few businesses with equal capital investment that have so short an operating period. If an alternative use could be found for even the power plant during the idle season, a considerable economic saving might be realized. The gin businesses studied have almost without exception found no profitable use for their gin facilities during the idle season. In a few instances the seed and seed-cotton storage houses have been utilized for the storage of feeds during the spring and early summer.

CHARGES FOR GINNING

BASIS OF CHARGES

Ginning charges are based on the hundredweight of seed cotton and are exclusive of bagging and ties. The hundredweight basis is fair and just—it is an unvarying basis, whereas the bale is a variable unit. In some communities the amount of seed cotton required to make a 500-pound bale of lint is higher than in others, because of varieties of cotton grown and soil and climatic conditions. Again, the hundredweight is an equitable basis because of bollies and snaps, which require a much larger quantity to make a bale. The most important justification is that it imposes the charge in direct proportion to the quantity ginned. Charges for ginning picked cotton during the 1924-25 season were in most cases 40 cents per hundredweight; but a few plants ginned for 35 cents, and a few worked for as low as 30 cents. The usual charge per hundredweight for bollies and snaps was 50 cents. As a rule bagging and ties were sold to customers for \$1.50 per pattern.

DETERMINATION OF CHARGES

Ginning charges are determined to a large degree by competition. Attempts have been made in a number of cases to get the ginners in a county or in a town to agree in conference prior to the opening of the season as to what the charges should be for the coming season. It is said that these ginners' conferences have not attempted to keep up high charges so much as to obtain an intelligent discussion and consideration of the cost factors in the local situation beforehand to prevent disastrous competition after the season opens. In answer to a question relative to how the charge is determined most ginners replied that they "followed the other fellow."

SEED USED IN SETTLEMENT

Charges for ginning and for bagging and ties are usually settled when the seed is sold. As most growers sell their seed to the ginner, credit is almost unknown in the ginning business. It is an almost

⁷ Equivalent 12-hour days.

insignificant item when the size of the business is taken into consideration. A very small percentage of ginning income is in the form of cash. The difference between the total gin charges per bale and the amount the seed comes to is called a "premium." Some customers have a number of bales ginned, in some instances their entire crop, before making a settlement; the seed when left is usually more than enough to balance the charges for gin service.

Cottonseed, in the area studied, is seldom weighed when purchased from a customer. The approximate weight is arrived at by applying a percentage, 60 to 62 per cent, to the weight of seed cotton. This is a practice which at first seems unfair to the producer of low-percentage lint cotton. He is forced to sell his seed on a basis which may be fair to the community, but under a system which fails to distribute the value equitably among the producers in the community. The ginner uses a percentage that will permit him to break about even for the season, occasionally gaining a few tons and as often losing a few. This practice removes the necessity for an additional investment in seed scales, or, on the other hand, saves the farmer the trouble of "catching" his seed, driving it on to the platform scales for weighing, and then having to unload it into the seed house by hand.

Present practice enables the seed to be conveyed directly to the seed house without any loss in time or labor. It would probably be exceptional for a grower to suffer an appreciable economic loss under this system. If he has exceptionally high-quality cotton with a high-percentage lint, he gains by having an average applied; and if he has a variety which produces a low-percentage lint, he suffers a small penalty. The chances are that on the average the majority of growers in a community experience only small variations in the output from the varieties grown. At most a grower could lose only a small amount per bale, depending upon the price of seed.

In communities or sections where a considerable portion of the crop is snapped and gathered as bollies, it is necessary that the seed be weighed. The quantities of snaps or bollies required to make a bale vary so greatly that it is practically impossible to apply a percentage that will prove satisfactory. Nearly all gins in the areas where cotton is harvested rather extensively, instead of being clean picked, have special seed scales as a part of their equipment.

COMPETITIVE PRACTICES

CUTTING GINNING CHARGES

The most common form of competition is in reducing charges for ginning. This is probably the easiest competition to practice, but when carried to an extreme undoubtedly may prove to be one of the most costly from the standpoint of the ginner. It seems that ginner in most communities have now had sufficient experience in this direction and realize that they must consider their operations over a period of years and not for one particular season. From the profits of good years must be accumulated a small surplus to help tide over the lean years, which always come in a ginning business because of absolute dependence on the size of the local crop harvested. Unfavorable weather conditions often affect the ginner in the same way they do the farmer.

BUYING PRODUCTS

The buying of baled cotton by ginners, often at a slight premium over the market, is a competitive practice frequently resorted to in an attempt to attract patronage. The ginner evidently thinks that his speculative risk will prove of value to him. He reasons that if he "breaks even" on his cotton purchases he will have profited because of an increase in the volume of his ginning business. In other words, he is willing to buy and sell cotton gratis and, if necessary, take a small loss, if that will indirectly increase the profits of his ginning business. And if the price of cotton should advance with the season he has a good chance to gain thereby. This practice, though frequent, is not common in the area covered by this study. In general, it would no doubt be more economical for ginners to stick to their primary interests and let other agencies do the job of cotton marketing.

The seed market is too limited to permit much competition among ginners in the purchase of seed as a means of attracting additional patronage. The local oil mills are the principal markets for seed, and the price paid by them to ginners does not allow sufficient margin to warrant a material increase in price to the grower. Large quantities of seed can not be stored by the ginners, so the current oil-mill prices determine to a large extent the price paid at the gin.

KIND OF SEED COTTON BOUGHT BY GINS

Almost every cotton grower has a few hundred pounds of seed-cotton remnants at the end of the picking season. Occasionally two or three neighbors pool their remnants in order to make a bale, but usually it is sold to the ginner as seed cotton. In addition, it is more or less a common practice in some communities to sell bollies prior to ginning. This is a very rough grade of cotton usually gathered at the extreme end of the season, and a higher charge is made for ginning it. The quantity required to make a bale varies from 1,750 to 2,500 pounds, depending upon the quantity of trash and burrs included. The tendency seems to be for the grower to sell as much of bollies as possible in the seed. Complete data for 34 plants in 1924-25 (Table 6) show that of the total hundredweight of seed cotton bought by ginners, bollies ranged from 25 to 100 per cent. Of the seed cotton bought by one plant 25 to 40 per cent was bollies; by 5 plants, 41 to 55 per cent; by 6 plants, 56 to 70 per cent; by 14 plants, 71 to 85 per cent; and by 8 plants, 86 to 100 per cent.

TABLE 6.—Percentage of bollies in total hundredweight of seed cotton bought by 34 plants in north-central Texas, 1924-25

Percentage of bollies of total hundredweight bought	Number of plants	Cumulative percentage
25 to 40.....	1	2.9
41 to 55.....	5	17.8
56 to 70.....	6	35.3
71 to 85.....	14	70.5
86 to 100.....	8	100.0
Total.....	34	100.0

KIND OF COTTON GINNED

An early frost often means a higher percentage of rough cotton to be ginned. Bolls that are partly open when the frost comes are gathered, ginned, and make low grades of marketable cotton. The practice of harvesting bollies is more common in some communities than in others. In Table 7 the percentage of bollies in the total hundredweight of seed cotton ginned is shown for 36 plants. Further details are also shown in Table 7.

TABLE 7.—Percentage of bollies in total hundredweight of seed cotton ginned by 36 plants in north-central Texas, 1924-25

Percentage of bollies of total hundredweight ginned	Number of plants	Cumulative percentage
Under 1.....	3	8.3
1.1 to 5.....	7	27.7
5.1 to 10.....	12	61.1
10.1 to 15.....	6	77.8
15.1 to 20.....	6	94.4
20.1 to 25.....	1	97.2
25.1 to 30.....	1	100.0
Total.....	38	100.0

UNMIXED SEED FOR PLANTING

All ginners indicated that they had cooperated with their customers when asked to do so in returning unmixed seed to them for planting purposes. The ginners of some communities had more requests for service of this kind than others, but in all cases the ginner signified his willingness to assist in keeping varieties pure.

This does not mean that ginners are always willing to clean out their seed rolls in order to gin a bale or two of cotton from which the farmer wishes to catch his seed for planting. There are rush periods in ginning that make such a procedure very expensive in time and money, and sometimes it is almost impossible. But almost every gin plant has a seed-cotton storage house where the farmer can store several bales at no cost to himself. Then at a suitable period the ginner will make a continuous run from the grower's stall in the cotton house and thus make it possible for him to get back unmixed a sufficient quantity of his own seed to use for planting purposes.

COSTS OF GINNING

METHOD OF ANALYSIS

For the purpose of a cost analysis it is desirable, if not actually necessary, to divide a ginning business into its principal subdivisions.

Every ginning business has four or five sources of income, and without treating each of these separately it would be impossible to determine the strong and weak points of a business or of a group of comparable businesses.

DEPARTMENTS IN A GINNING BUSINESS

In this study the following briefly described departments have been used: (1) *Custom ginning*. Gin service is performed for a stipulated charge per hundredweight of seed cotton to be ginned.

(2) *Bagging and ties.* In addition to ginning, gin service includes the pressing and wrapping of the bale of cotton, but the price of the wrapping material is not included in the charge for ginning. The wrapping material is bought and kept on hand by the ginner for sale to the customer and therefore becomes a source of income. (3) *Cottonseed business.* Seed is purchased from the grower and sold to the cottonseed-oil mills. The customer usually settles his ginning and bagging and ties charges when he sells his seed. (4) *Seed-cotton business.* Nearly all gins buy some seed cotton. Toward the end of the picking season many growers have odd lots of seed cotton to be disposed of. They do not have enough to make a bale or they have too much for even bales. The ginner buys up these remnants and gins them for the account of the gin and sells the resulting lint cotton and seed. It is not unusual for a few bales of bollies to be bought and handled likewise. (5) *The purchase and sale of baled cotton.* (6) *Mercantile business.* This includes the purchase and sale of coal, feed, seed, etc.

PRORATING COSTS TO THE GINNING DEPARTMENTS

The matter of apportioning costs to the several departments of a ginning business is very important. In this study all direct costs have been charged to the department or departments concerned. The cost of drayage of cottonseed, for instance, was applied directly to cottonseed expense. Custom ginning of course bears the major part of the expenses. It is the basic enterprise of the business and incurs a large operating expense.

The question naturally arises as to how far one can or should go in prorating expenses like management and labor to the various departments. It is a fact that part of management is for the purchase, and, particularly, the sale of seed. But as to whether the cost of management is increased by having duties other than custom ginning to superintend is a debatable question. The seed business grows out of the custom-ginning business and might be said to be indispensable to it; therefore it could be argued that ginning should bear all except direct expenses. The same line of argument might be offered for bagging and ties and, to a limited extent, for seed-cotton business.

In the final analysis, it would seem that custom ginning is the real business and should bear the expenses necessary to the efficient conduct of that business. The other departments become adjuncts to custom ginning and help to diversify the business. No additional capital investment is required because of them; management and labor are more efficiently employed, with perhaps little, if any, increase in cost; the business is better balanced; and finally, the opportunity for profit is materially increased. Therefore, in this study direct costs have been charged against the department or departments involved, and only in the case of the seed-cotton business has an apportionment of ginning expenses been made.

An apportionment of ginning expense was necessary in the case of the seed-cotton business because of the manner in which this department was set up and analyzed in the study. Seed cotton is bought by the gin and ginned for its account, and the two resulting products, seed and lint, are sold. Obviously, this department

should bear its proportional part of the total cost of ginning. Total ginning cost was prorated to seed-cotton business on a hundred-weight of seed-cotton basis according to the proportion of bought seed cotton to the total hundredweight of seed cotton ginned. This was simply a transfer between departments, and it was deemed proper to make it on a cost basis in order that the profits of the departments affected might not be unduly influenced.

As a matter of practice, most gin managers make the same charge to themselves for ginning bought seed cotton as they make to their customers. As a result of this practice, book ginning receipts are slightly inflated, and seed-cotton business shows a correspondingly smaller profit. But the ginners are necessarily conservative in their present practice because at the time of purchasing seed cotton they do not know their ginning costs per unit. It is necessary to make an approximation, and the easiest guide to follow is the current charge. In determining departmental profits at the close of the season the method used here might be of considerable value, particularly to ginners that buy large quantities of cotton in the seed.

USE OF INTEREST ON INVESTMENT

The inclusion of interest on investment as a cost in this study is of secondary importance to its inclusion as an equalizing factor in facilitating comparisons of costs. No attempt is made here to justify its inclusion for any other purpose. On account of variations in capital invested because of variations in size of plant, type of equipment, and kind of power plant, the use of interest as an equalizing factor is indispensable in a study of this kind. When earnings are discussed, after interest on investment has been included as a cost for the above reason, it should be borne in mind that an allowance for interest has already been made, and with the amount, or rate, of the allowance at hand, adjustment may easily be made to show profits inclusive of interest on investment. The discussion of earnings which appears later in this bulletin will attempt to maintain this position as far as possible.

USE OF REPRODUCTION COSTS

Efforts were made, first, to ascertain the original cost of each plant visited, and later, to obtain appraisal values for each of the properties under study. When these attempts failed, final resort was made to a schedule of reproduction costs for various sizes and types of plants. This schedule was compiled with the assistance of leading manufacturers of ginning machinery and professional gin appraisers. It is given in Table 31 in Appendix B.

It is not intended here to attempt to establish a precedent for the use of reproduction values in a determination of costs. The method was adopted only after painstaking but futile efforts had been made to find a more satisfactory basis. The ginning industry in this area has gone through a period of development and marked adjustment in the last 10 years. Many improvements have been made in ginning machinery, new machines have been added because of the change in service demanded by growers, and altogether most of the gin plants now operating in the area have been either built new or rebuilt during the past decade. The net result of this is that the

gin plants studied probably approach in capitalization the figures set forth in Table 31 and used as reproduction values. A full discussion of the capital investment of gin plants is given in Appendix B.

EXPLANATION AND DEFINITION OF TERMS USED

Maintenance.^a—The term "maintenance" is used to cover yearly cost of repairs and annual depreciation. In other words, the amounts listed under maintenance are estimated to be those amounts which, over a period of years, the expected life of the plant, will keep the plant in a normal state of repair and at the same time accumulate a reserve sufficient to restore it when it shall have become unfit for further use through normal wear and tear and obsolescence.

Management.—In most cases management includes only the salary of the gin manager. There are a few cases where it also includes the salary of a superintendent and salaries of other officials. In the case of line^b gins it includes a prorated part of the general management overhead, the division being made on the basis of bales ginned. The wages of the weigher or bookkeeper are not included in management but in labor.

Labor.—Labor includes all compensation to employees except that part included under management.

Insurance.—Three kinds of insurance are included here—fire insurance on property, employer's liability, and fire insurance on products.

Power.—Coal, oil, and grease, water, electricity, natural gas, and like items are included under power.

Taxes.—All taxes except income tax are listed under taxes.

Office.—Stationery, stamps, books, tags, etc., are entered as office expense.

Miscellaneous.—Expense not included under any of the above items goes under miscellaneous.

Interest on investment.—Interest on investment has been computed on the reproduction costs shown in Table 31, Appendix B, at a rate of 6 per cent. This is the legal rate in the State of Texas, and although perhaps not often the rate actually paid, it makes it possible to compare the cost of ginning in individual plants.

Very few plants had interest expense except on capital invested. No account has been taken of small expenditures for interest on operating capital because a very small amount of working capital is needed to run a ginning business. Most supplies are bought on time, and interest, where it occurs, is included in their initial cost. In the seed business some capital is required, but settlements are made at least monthly with the oil mills, and most gins usually have a considerable quantity of growers' seed pending settlement. This means that the ginner is at least partially compensated for any short-time loans he may require.

Net profits.—Net profits as used here is the amount left after paying all expenses, including allowances for interest on investment and for maintenance.

Plant.—The term "plant" is used as meaning a ginning establishment irrespective of size.

^a See Appendix A, page 50, for method of determining maintenance.

^b See footnote 5.

Gin.—The term "gin" in this study designates a single-battery plant of either four or five stands.

Double battery.—A double battery is a plant with two batteries of gin stands (two gins).

Gin stand.—A gin stand is a single unit of a battery of gin stands.

Custom ginning.—Custom ginning is the principal department of a ginning business—that part of the business which comes directly from customers.

INFLUENCE OF VOLUME

Volume is one of the major factors in the success of any business. A proper adjustment of volume and plant capacity is the principal determinant of maximum operating efficiency. In ginning, the operating period is short and often very irregular because of variations in weather conditions which delay picking and hauling to the gin. For this reason the operating organization of a ginning business must be very elastic. The organization must be able to adapt itself to a run of from a few bales a day up to a baleage which taxes its maximum capacity.

The size and adaptability of a plant should be determined over a period of years. The potential production of the community served is limited, and the variations or deviations from this production are rather marked from year to year on account of the many phenomena which influence production. Changes in the size and number of gin plants in a territory also vitally affect the opportunity of the individual plant to secure an optimum volume. As good roads and auto trucks increase the size of the gin community the tendency will be for total volume per plant to increase, but it may be that in many instances a corresponding growth in ginning facilities will result. As long as the grower demands immediate gin service (that his bale be ginned as quickly as it is out of the field) the ginner is almost helpless in improving his efficiency greatly by a better adjustment between volume and size of plant.

Two unit measurements of volume—hundredweight and bale—have been used in this study of ginning costs. In practice, input is usually expressed in terms of hundredweight of seed cotton, and the charge for ginning is made on this basis. In speaking of total volume ginned, however, the bale is the unit more commonly used. Since income is on the hundredweight basis, costs are also expressed in terms of the same unit; therefore in the tables and discussions which follow both units are generally employed.

BALES GINNED PER PLANT

To study the influence of volume on costs, the 74 gin plants studied were sorted into groups according to number of bales ginned. A group range of 500 bales was used, and five groups resulted from the sorting, representing a total range of 2,500 bales, or from 1,000 to 3,500 bales. These data are shown in Table 8. As double-battery plants were counted twice, each battery being considered a gin, the data in Table 8 are for 89 gins. The average number of bales ginned per plant was 1,914, and the average number per gin, 1,592. In the fourth and fifth groups the average number of bales per gin decreases because more double-battery plants are included in those groups. A double-battery plant, obviously, does not obtain twice

the volume of a single-battery plant. As will be pointed out later, it does not need to do so in order to maintain its efficiency, because of a marked decrease in overhead costs.

TABLE 8.—Relation of volume to cost of ginning per bale¹

Bales ginned per plant	Number of plants	Number of gins ²	Total quantity ginned	Average quantity ginned		Average cost per bale ³
				Per plant	Per gin	
				Bales	Bales	
1,001 to 1,500	21	22	20,846	1,278.3	1,220.2	\$6.970
1,501 to 2,000	25	26	43,428	1,737.1	1,670.3	5.843
2,001 to 2,500	15	18	32,604	2,179.6	1,810.3	5.413
2,501 to 3,000	8	13	22,358	2,794.7	1,720.0	5.131
3,001 to 3,500	5	10	16,341	3,268.2	1,634.0	4.581
Total and average	74	89	141,660	1,914.4	1,591.7	5.699

¹ All data in this and subsequent tables are for the season 1924-25 only. An allowance for use of capital is included in all costs computed.

² Double-battery plants are counted twice.

³ Averages are weighted by total number of bales ginned.

It is interesting to note the influence of each additional increment of volume (approximately 500 bales) on average cost, as shown in Table 8. From the first to the second group there is an increase of 459 in the average number of bales ginned per plant, which is about a 36 per cent increase in volume. The corresponding average costs per bale show a decrease of \$1.13, or 16 per cent. Thus for a 36 per cent increase in volume, in this instance, a decrease in cost of 16 per cent results. From the second to the third group there is an increase of 442 in the average number of bales ginned per plant, which is a percentage gain of 35 per cent on the basis of the average number of bales in the first group. The decrease in average costs from the second to the third group is 43 cents, a decrease of 6 per cent in the average costs of the first group. Thus with a second increment of 35 per cent in volume there resulted a decrease of 6 per cent in cost. From the third to the fourth group there is an increase of 615 bales or 48 per cent and a corresponding decrease of 28 cents, or 4 per cent, in costs. An increment of 474 bales to the fourth group, an increase of 37 per cent, resulted in a corresponding decrease of 55 cents, or 8 per cent, in cost. Altogether there is an increase in average volume per plant from the first to the fifth group of 1,990 bales, or 156 per cent. Likewise there is a decrease in costs per bale of \$2.39, or 34 per cent. On an average, therefore, for each hundred bales increase in volume from 1,278 to 3,268 bales, there tends to be a decrease of about 12 cents per bale in average cost of ginning.

HUNDREDWEIGHT GINNED PER PLANT²⁰

The volume and cost data for 74 plants analyzed in Table 8 on a bale basis have been treated in a like manner on a hundredweight basis, and the results are shown in Table 9. Five volume groups again result, and the number of plants in each group is about the same, the only exceptions being the first and second groups. There is one more plant in the first group and one less in the second group

²⁰ The term "hundredweight," as used throughout this bulletin, refers to seed cotton.

than in the groups in Table 8, but this slight difference does not materially affect any of the conclusions already drawn; the variations in volume and in costs are strictly analogous to those previously discussed. On the average about 15 hundredweight of seed cotton are required to make a bale; so, generally speaking, a conversion from volume in bales to volume in hundredweight may be accomplished by multiplying the number of bales by 15.

TABLE 9.—Relation of volume to cost of ginning per hundredweight

Hundredweight ginned per plant	Number of plants	Number of gins ¹	Total quantity	Average quantity ginned		Average cost per hundredweight ¹
				Per plant	Per gin	
			<i>Cwt.</i>	<i>Cwt.</i>	<i>Cwt.</i>	<i>Cents</i>
15,001 to 22,500.....	22	23	415,622	13,902	18,071	46.9
22,501 to 30,000.....	24	25	620,403	25,850	24,816	40.5
30,001 to 37,500.....	15	18	483,730	32,382	25,985	35.3
37,501 to 45,000.....	8	13	325,145	41,143	25,319	33.7
45,001 to 52,500.....	6	10	237,356	47,471	23,736	33.2
Total and average.....	74	89	2,088,256	28,219	23,404	38.7

¹ Double-battery plants are counted twice. ² Averages are weighted by total hundredweight ginned.

SIZE OF PLANT

Of the 74 gin plants included, 19 are 4-stand plants, 40 are 5-stand plants, and 15 are 8, 9, and 10 stand plants. Because of the limited number of plants in the sample, no effort was made to subsort these groups according to whether the stands were 70 or 80 saws in size. In total number of saws, the 4-stand plants have an average of 301, the 5-stand plants 370, and the double-battery plants 646. These figures are shown in Table 10. The 4-stand plants ginned an average of 22,090 hundredweight per plant, or approximately 1,500 bales; the 5-stand plants ginned an average of 27,176 hundredweight, or about 1,800 bales; and the double batteries ginned 38,767 hundredweight, or about 2,600 bales per plant. The average for all plants was 28,220 hundredweight, or approximately 1,900 bales.

TABLE 10.—Relation of size of plant to cost of ginning, plants grouped according to number of gin stands

Number of stands	Average number of saws	Total quantity ginned	Number of plants	Average quantity ginned per plant	Average quantity ginned per 70 saws	Average cost per hundredweight ¹
		<i>Cwt.</i>		<i>Cwt.</i>	<i>Cwt.</i>	<i>Cents</i>
4.....	301	415,702	19	22,089.5	5,137.1	42.5
5.....	370	1,087,054	40	27,176.3	5,142.2	37.6
8 or more.....	646	581,500	15	38,766.6	4,198.6	37.9
Total and average.....	408	2,088,256	74	28,219.7	4,838.4	38.7

¹ Averages are weighted by quantity ginned.

The cost of ginning per hundredweight was highest for 4-stand plants, and there was only a fractional difference in cost for 5-stand and double-battery plants; the former had a cost of 42.5 cents per hundredweight, whereas the two last named had costs of 37.6 and 37.9 cents, respectively. It seems apparent that the volume of

double batteries over that of 5-stand plants is just sufficient to take care of the additional overhead required. With the same cost per hundredweight and a much larger total volume the profits earned will of course be considerably greater in the case of double batteries. The average cost for the 2,088,256 hundredweight ginned by 74 plants was 38.7 cents per hundredweight.

HUNDREDWEIGHT GINNED PER 70 SAWS

The average total hundredweight ginned by each size of plant was computed on a 70-saw basis to obtain a fair comparison of the relative utilization of plant capacity. The average hundredweight ginned per 70 saws is practically the same in the case of 4 and 5 stand plants. There is a difference of only 5 hundredweight in favor of the larger plant. Double-battery plants ginned an average of only 4,199 hundredweight per 70 saws, nearly 1,000 hundredweight less than 4-stand plants. These data are shown more fully in Table 10.

An analysis was made of the influence of volume, expressed as quantity ginned per 70 saws, on the cost of ginning for the different-sized plants. Table 11 shows the 19 4-stand plants sorted into four groups according to quantity ginned per 70 saws. On the average, the 19 plants ginned 5,137 hundredweight per 70 saws at a cost of 42.5 cents. Even though the influence of volume is marked, it is readily apparent that the average cost for this size of plant is very high, particularly when it is recalled that average custom receipts are less than 40 cents per hundredweight. Only 3 of the 19 plants, those with the highest volume, had average costs of less than 40 cents.

TABLE 11.—Relation of hundredweight ginned per 70 saws to cost of ginning for 4-stand plants

Hundredweight ginned per 70 saws	Number of plants	Total quantity ginned	Average quantity ginned per 70 saws	Average cost per hundredweight ¹
		Cwt.*	Cwt.	Cents
3,001 to 4,000.....	2	30,872	3,602.3	36.3
4,001 to 5,000.....	8	159,996	4,519.7	44.4
5,001 to 6,000.....	6	136,150	5,424.3	42.0
6,001 or more.....	3	92,684	7,355.8	35.5
Total and average.....	19	419,702	5,137.1	42.5

¹ Averages are weighted by hundredweight ginned.

The 40 5-stand plants were sorted into six groups according to hundredweight ginned per 70 saws. Two of these ginned less than 3,000, 5 ginned 3,001 to 4,000, 10 ginned 4,001 to 5,000, 15 ginned 5,001 to 6,000, 5 ginned 6,001 to 7,000 and 3 ginned more than 7,000 hundredweight per 70 saws. This analysis of 5-stand plants is given in Table 12. The range in average costs was from 49.3 cents in the first group to 30.9 cents in the fifth group. The average cost for the fifth group was a little lower than for the sixth group, perhaps because of the small number of plants represented in these two groups. The average cost per hundredweight for the 40 plants was 37.6 cents. Twenty-three of the 40, those in the last three groups, had average costs of less than 40 cents. A similar analysis of the fifteen 8 and 10 stand plants is shown in Table 13.

TABLE 12.—Relation of hundredweight ginned per 70 saws to cost of ginning for 5-stand plants

Hundredweight ginned per 70 saws	Number of plants	Total quantity ginned	Average quantity ginned per 70 saws	Average cost per hundred-weight ¹
Under 3,000.....	2	<i>Cwt.</i> 33,382	<i>Cwt.</i> 2,928.2	<i>Cents</i> 49.3
3,001 to 4,000.....	5	88,328	3,438.8	47.6
4,001 to 5,000.....	10	240,752	4,559.6	41.3
5,001 to 6,000.....	16	446,731	5,535.7	36.4
6,001 to 7,000.....	5	163,907	6,377.0	36.9
7,001 or more.....	3	113,954	7,596.9	33.0
Total and average.....	40	1,087,054	5,142.2	37.6

¹ Averages are weighted by hundredweight ginned.

TABLE 13.—Relation of hundredweight ginned per 70 saws to cost of ginning for 8 and 10 stand plants

Hundredweight ginned per 70 saws	Number of plants	Total quantity ginned	Average quantity ginned per 70 saws	Average cost per hundred-weight ¹
Less than 3,000.....	1	<i>Cwt.</i> 19,048	<i>Cwt.</i> 2,493.0	<i>Cents</i> 66.5
3,001 to 4,000.....	5	157,243	3,623.0	43.7
4,001 to 5,000.....	6	260,006	4,429.7	33.6
5,001 to 6,000.....	3	143,400	5,103.2	35.2
Total and average.....	15	581,500	4,198.8	37.8

¹ Averages are weighted by hundredweight ginned.

To make the comparison easy, parts of the three preceding tables are consolidated in Table 14. Slight adjustments in grouping were made, which necessitated the omission of two 5-stand plants and one double-battery plant. Four volume groups are shown in Table 14, and it may be seen at a glance how the different-sized plants compare in volume and corresponding costs. (Fig. 7.)

TABLE 14.—Relation of size of plant to cost per hundredweight according to hundredweight ginned per 70 saws

Hundredweight ginned per 70 saws	Size of plant											
	4 stands				5 stands				8 and 10 stands			
	Number of plants	Quantity ginned per 70 saws	Average quantity ginned per plant	Average cost per hundred-weight ¹	Number of plants	Quantity ginned per 70 saws	Average quantity ginned per plant	Average cost per hundred-weight ¹	Number of plants	Quantity ginned per 70 saws	Average quantity ginned per plant	Average cost per hundred-weight ¹
3,001 to 4,000.....	2	<i>Cwt.</i> 3,602.3	<i>Cwt.</i> 15,436.0	<i>Cents</i> 56.3	5	<i>Cwt.</i> 3,436.8	<i>Cwt.</i> 17,665.6	<i>Cents</i> 47.6	5	<i>Cwt.</i> 3,623.0	<i>Cwt.</i> 31,448.6	<i>Cents</i> 43.7
4,001 to 5,000.....	6	4,519.7	19,999.5	44.4	10	4,559.6	24,075.2	41.3	6	4,429.7	43,484.8	33.6
5,001 to 6,000.....	6	5,424.3	22,691.7	42.0	15	5,635.7	29,782.1	36.4	3	5,163.2	47,800.0	35.2
6,001 or more.....	3	7,355.6	30,894.7	35.5	8	6,827.1	34,732.6	31.8				
Total and average.....	10	5,137.1	22,089.5	42.5	38	5,268.4	27,728.2	37.2	14	4,303.1	40,110.8	36.8

¹ Averages are weighted by hundredweight ginned.

INFLUENCE OF KIND OF POWER

Three kinds of power plants are used in this area—steam, electric, and oil engine. No doubt each has advantages which recommend it to the prospective buyer. In many communities electric current is not procurable in commercial quantities, and for this reason many ginners have only to choose between steam and oil engine plants as prime movers. Where all three kinds of power are available it has been found a decided advantage, from the standpoint of cost and convenience, in the case of double-battery plants to have one battery driven by an electric motor. This arrangement enables the ginner to handle the straggling loads of cotton at the beginning and close of the season with a minimum of labor and power costs. In some communities the kind of water is an important factor in choosing a power plant. If the water is hard and causes the boiler to depreciate rapidly, steam power may prove more expensive than

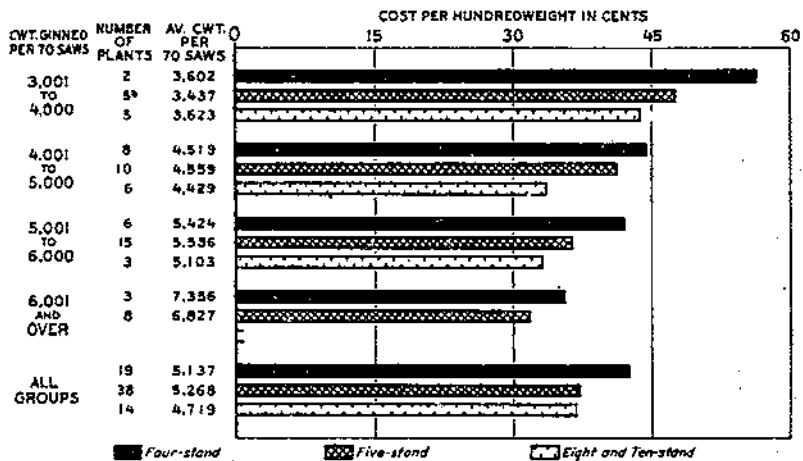


FIG. 7.—RELATION OF SIZE OF PLANT TO AVERAGE COST OF GINNING, 1924-25

The plants have been sorted into volume groups and each volume group into sub-groups according to size of plant.

either of the other two in the long run, when ordinarily it might be cheapest. The kind of power to install is a question which must be determined by the individual, in the light of local conditions.

POWER COST

No attempt has been made in this study to analyze power cost further than the operating-fuel costs of different kinds of power plants. Repairs, depreciation, and interest on investment must be considered in addition to fuel costs in determining which kind of power plant will prove the most economical for use.

What are the relative operating costs of power for steam, electric, and oil engine plants? Table 15 shows 65 plants sorted into five volume groups, according to bales ginned per plant. Each volume group was subsorted according to kind of power plant, and in this manner the cost of power for each kind of power plant was placed on a fairly comparable basis.

A summary of 65 plants shows that 22, or one-third, are electric; 37, or more than one-half, are steam; and 6 are oil. The average number of bales ginned per electric plant was 1,970; per steam plant, 1,917; and per oil-engine plant, 1,940. The average cost of electric power per bale for the ginning of 43,335 bales by the 22 plants was 94.7 cents, the average cost of steam power for the ginning of 70,944 bales by 37 plants was 66.4 cents, and the average cost of oil-engine power for the ginning of 11,643 bales by 6 plants was 22.9 cents.

TABLE 15.—Influence of kind of power on total cost of ginning, on labor cost, and on power cost per bale, by groups, according to volume ginned per plant

Bales ginned per plant	Kind of power	Number of plants	Number of gins	Number of bales	Average quantity ginned		Average cost per bale ¹	Cost per bale	
					Per plant	Per gin		Labor ¹	Power
1,001 to 1,500	Electric	8	6	7,992	1,332.0	1,332.0	\$6.793	\$1.422	\$1.055
	Steam	10	10	12,708	1,270.8	1,270.8	6.765	1.635	.823
	Oil	1	2	1,947	1,347.0	673.5	9.854	1.918	.238
1,501 to 2,000	Electric	7	7	12,416	1,773.7	1,773.7	5.284	.989	.893
	Steam	13	14	22,237	1,710.5	1,588.4	5.975	1.544	.672
	Oil	3	3	5,241	1,747.0	1,747.0	5.820	1.623	.249
2,001 to 2,500	Electric	5	6	10,558	2,111.6	1,759.6	5.708	1.369	1.012
	Steam	7	9	16,629	2,232.7	1,736.6	5.295	1.389	.719
	Oil	1	1	2,281	2,281.0	2,281.0	5.071	1.360	.150
2,501 to 3,000	Electric	2	2	5,657	2,828.5	2,828.5	4.414	1.199	.851
	Steam	5	9	13,927	2,785.4	1,547.4	5.391	1.695	.537
	Oil	1	2	2,774	2,774.0	1,387.0	5.289	1.117	.253
3,001 to 3,500	Electric	2	4	6,712	3,356.0	1,678.0	5.037	1.231	.953
	Steam	2	4	5,383	3,191.5	1,595.7	4.361	.992	.459
	Oil	2	4	6,712	3,356.0	1,678.0	5.037	1.231	.953
Summary	Electric	22	25	43,335	1,969.7	1,733.4	5.514	1.234	.947
	Steam	37	46	70,944	1,917.4	1,542.3	5.707	1.500	.664
	Oil	6	8	11,643	1,940.5	1,455.4	6.013	1.485	.229

¹ Averages are weighted by bales ginned.

Steam power seems to be more efficiently employed in larger plants than either electric or oil-engine power. Electric-power cost tends to run more or less the same per bale, regardless of the number of bales ginned; about the same amount of time is required to gin one bale as another, as the power is turned off and on as needed. Oil-engine power also tends to run about the same in cost per bale, for after the engine is thoroughly warmed it can be started and stopped with only a small amount of lost power. The figures for cost of steam power, by groups, show a very nice gradation in cost per bale with increase in volume. (Fig. 8.) The average cost per bale in Group 1 was 82 cents; in Group 2, 67 cents; in Group 3, 72 cents; in Group 4, 54 cents; and in Group 5, 46 cents. The other kinds of power do not show so marked a decrease in cost per bale with increase in volume.

A brief inspection of power costs as influenced by size of plant is interesting at this point. Table 16 shows 19 4-stand plants, 32 5-stand plants, and 14 double-battery plants grouped according to kind of power, regardless of volume. Cost of power per bale was uniformly lowest for oil-engine plants. Electric power costs from four to six times as much per bale as oil-engine power. On the other hand, labor costs for 4 and 5 stand plants were considerably lower when electric power was used. Power cost per bale for electric

and oil-engine plants appears to increase with size of plant and volume, whereas steam power shows a consistent tendency to decrease in cost per bale with increasing volume.

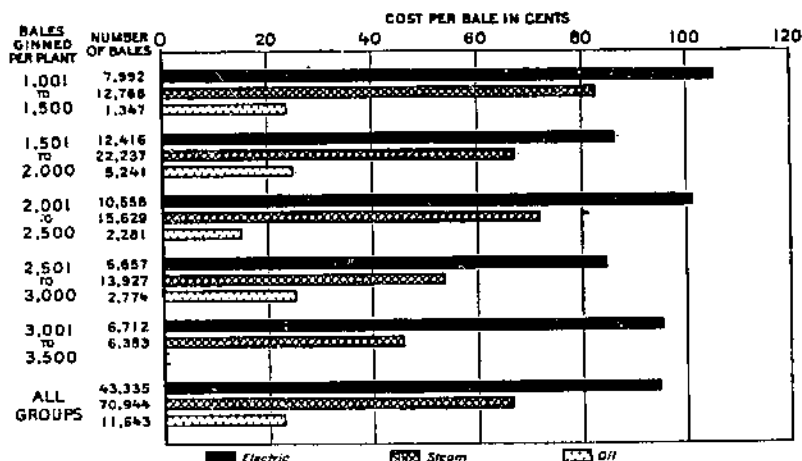


FIG. 8.—POWER COSTS FOR GINNING BY KIND OF POWER USED, 1924-25

Cost of power, by kinds of power plants, according to volume of cotton ginned. Electric power shows highest cost per bale, steam power second highest, and oil-engine power lowest. Steam-power cost seems to be influenced most by variations in volume. Power cost does not include repairs or depreciation on power plant.

TABLE 10.—Influence of kind of power on power and labor costs per bale for different sized plants

Kind of power	Size of plant in stands (number)	Number of plants	Average quantity ginned per plant		Quantity ginned per 70 saws	Total cost ¹		Cost per bale ¹	
			Bales	Cwt.		Per bale	Per hundred-weight	Power	Labor
Electric	4	7	1,714.0	25,063.3	5,914.2	5.601	38.27	92.4	112.0
Steam	4	11	1,372.0	20,111.3	4,067.2	6.814	46.48	86.3	179.1
Oil	4	1	1,574.0	22,823.0	4,961.0	5.347	36.90	15.0	143.0
Electric	4	12	1,876.8	28,147.4	5,439.1	5.428	36.19	94.1	115.9
Steam	5	17	1,895.8	28,130.6	5,500.5	5.378	36.09	63.3	135.0
Oil	5	3	1,982.0	28,849.3	5,512.0	5.658	38.68	23.8	157.3
Electric	8 and 10	3	2,937.3	43,065.7	4,581.5	5.614	38.30	99.4	149.8
Steam	8 and 10	9	2,625.2	38,609.1	4,227.3	5.479	37.30	57.9	151.9
Oil	8 and 10	2	2,060.5	29,730.0	3,362.2	6.781	47.00	24.8	137.9

¹ Averages are weighted by quantity ginned.

LABOR COST

The cost of labor for ginning a bale of cotton is also shown in Table 15, so that a comparison may be made between power and labor costs for the different kinds of power plants. Everyone realizes that little labor is required in the operation of an electric motor; therefore it is not surprising that the average total labor cost for electrically driven plants is considerably lower than that for steam and oil engine plants. Logically, less labor is required to operate an oil engine than a steam outfit inasmuch as a steam plant has to be

fired regularly, a constant watch kept on the steam pressure, etc., whereas the oil engine, after it has been properly started, needs attention only occasionally. In practice, however, one man is usually assigned to the operation of either the oil-engine or steam plant. On the average, the total cost of labor for ginning a bale in 22 electric plants is \$1.23, in 6 oil-engine plants, \$1.48, and in 37 steam plants, \$1.50. Because of the small number of oil-engine plants represented, the differential in labor costs for steam and oil engine plants is probably much less than it would be if a more reliable average had been possible.

The influence of volume on average total labor cost is not so marked as in the case of power cost because of a greater variation in practices involving labor, but there is a noticeable relationship between volume and total labor cost. With the exception of the fourth group, in which there are only five plants, and the electric plants in Group 2, a nice gradation in costs is shown with increase in volume. Labor cost per bale was highest in an oil-engine plant, \$1.92. It was a double-battery outfit with a volume of less than 1,500 bales. No oil-engine plant studied ginned more than 3,000 bales. The lowest average labor cost per bale was that in the seven electric plants in Group 2, \$0.99, and this was practically the same as the average cost in the two steam plants in Group 5, whose individual costs were \$0.71 and \$1.25 per bale.

The figures for oil-engine plants are indicative, but they are based on too few cases to be very reliable. The figures for electric and steam plants, on the other hand, are based on a fairly representative number of cases and are dependable. A study of the labor costs of these two types of power seems to show almost invariably a saving in labor where electric power is used.

The average cost of labor per bale in electric 4-stand plants was \$1.18, in electric 5-stand plants \$1.16, and in electric double-battery plants \$1.50. These and other data are given in Table 16. The groups are too small and the volume ginned and the practices too varied in different-sized plants to permit any reliable conclusions to be drawn.

TOTAL COST

The influence of kind of power on total cost of ginning is a factor it is impossible to measure accurately where data are limited in amount and cover a short period. Theoretically it might be said that over a long period the compensating advantages of each type of power, under similar conditions, would be such that costs would be approximately the same. If this were not true, one kind of power would eventually be used to the exclusion of all other kinds. In this analysis total cost includes maintenance and interest on investment, and so all elements of cost are embraced in the total. A slight variation in volume and in the size and dependability of the group will of course be expected to result in a variation in total cost (Tables 15 and 16).

In this analysis the volume ginned varies considerably in different size groups and in different kinds of power plants within the size groups. The number of plants in the various groups is also quite variable (Table 16).

INFLUENCE OF OWNERSHIP

A tabulation was made to determine the influence of ownership, if any, on the cost of ginning. In Table 17 comparative figures are shown for 22 line-gin plants and 18 independent-gin plants. All of these are 5-stand establishments, and they were sorted into three groups on the basis of hundredweight ginned per 70 saws. There was not a sufficient number of 4-stand and double-battery plants of each type to justify a comparison of costs for those sizes on a basis of ownership.

On an average the line gins have a slightly larger capacity than the independent gins. The 22 line gins have an average of 373 saws per plant, and the 18 independent plants have an average of 367 saws per plant. In all other comparisons the independent gins are favored both in volume groups and in total. Whether volume is expressed in average hundredweight per gin, average bales per gin, or in average hundredweight per 70 saws, the independent plants seem to have the advantage. It would seem that the kind of ownership and management is a more important factor in obtaining patronage or volume than in influencing costs directly. Table 17 shows that volume is the dominant factor in cost.

TABLE 17.—*Influence of ownership of plant on cost of ginning in 5-stand gins, by groups, according to hundredweight ginned per 70 saws*

Hundredweight ginned per 70 saws	Number of gins		Average number of saws per gin		Average quantity per gin		Average quantity per 70 saws		Average cost per hundredweight ¹	
	Line	Independent	Line	Independent	Line	Independent	Line	Independent	Line	Independent
Under 4,000.....	5	2	380.0	350.0	<i>Cwt.</i> 17,449.0	<i>Cwt.</i> 17,231.0	<i>Cwt.</i> 3,214.7	<i>Cwt.</i> 3,440.0	<i>Cents</i> 49.2	<i>Cents</i> 45.1
4,001 to 5,000.....	8	4	368.7	375.0	23,487.5	24,980.7	4,484.2	4,070.4	43.9	37.6
5,001 or more.....	11	12	372.7	367.0	30,498.7	32,425.5	5,734.8	6,195.9	38.2	33.3
Total and average.	22	18	372.7	366.7	25,615.4	26,684.2	4,812.3	5,551.5	40.1	34.9

¹ Averages are weighted by quantity ginned.

Line gins are usually controlled by outside capital and managed by a local manager who has no financial interest in the plant. His contacts as a gin manager are probably not so effective in obtaining volume as those of the manager of the independent gin, who in most cases is owner or part owner and who almost invariably is a leader in community affairs. This does not necessarily mean that the local manager of the line gin may not be a community leader; he may be, but the chances are that he is not as much so as his competitor, the independent gin manager. The line-gin company generally is not able to command the services of men to serve as local managers who can make more money working independently. The responsibilities and duties of a local line-gin manager are not as great as those of an independent gin manager. A considerable share of line-gin management is centered in the home office and must be compensated for in addition to the salary of the local manager. In the case of a company that controls a small number of gins, this is no doubt an important consideration in competing for superior local managers.

VARIATIONS IN COSTS

TOTAL COSTS

Up to this point all the costs shown have been average group costs. Individual-plant costs, from which the group averages were obtained, also deserve consideration in a complete analysis of the influence of cost factors. In Figure 9 the individual total costs per hundred-weight for 74 plants are shown by volume groups, the plants in each group arranged from high to low according to cost.

Medians of the different groups ranged from 46 cents for Group 1, plants ginning 15,001 to 22,500 hundredweight, to 34 cents for the group ginning 45,001 to 52,500 hundredweight. Volume is clearly

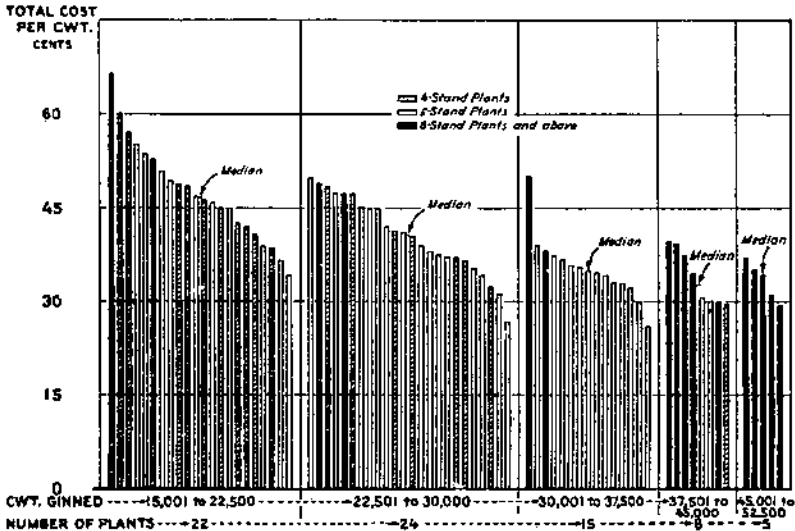


FIG. 9.—VARIATIONS IN TOTAL COST, 1924-25

Total cost of ginning, per hundredweight, for 66 plants arranged in groups according to volume ginned in plants of indicated sizes. Volume is clearly one of the principal factors in determining total costs per unit. Size of plant in relation to volume is also a factor of considerable significance.

one of the principal factors in determining total costs per unit; yet the influence of practices which require more labor or more power between plants is partly responsible for individual plant-cost variations.

LABOR COSTS

A study of the cost of labor per bale in 66 plants shows some striking variations with quantity of cotton ginned and where the quantity ginned is held fairly constant by volume groupings. In Figure 10 the individual labor costs of the 66 plants are shown arranged from high to low in volume groups, according to the size of the plant indicated. The cost of labor for plants ginning 1,001 to 1,500 bales ranges from \$0.83 to \$2.32, or a total range of \$1.49 per bale. The median cost of the group is \$1.59, and the average deviation is 40 cents. Twenty-three plants ginned from 1,501 to 2,000 bales, with a median labor cost per bale of \$1.35, a range of \$0.67 to \$2.24, and an average deviation of 36 cents. In the group gin-

ning 2,001 to 2,500 bales, the range was from \$1.01 to \$2.35 per bale, with a median of \$1.35 and an average deviation of 24 cents. Eight plants ginned 2,501 to 3,000 bales, with costs of \$1.12 to \$1.98 and a median cost of \$1.42 per bale. Five plants in this group were double batteries, two were 5-stand plants, and one was a 4-stand plant. In the last volume group, all of which were double-battery plants, the cost of labor ranged from \$0.66 to \$1.28 per bale.

It is obvious that some ginners are much more efficient in the use of labor than others. Variations of 100 per cent in cost between two plants ginning practically the same volume during the same season indicate a great opportunity and an imperative demand for increased efficiency. It is unlikely that rate of wages is of much

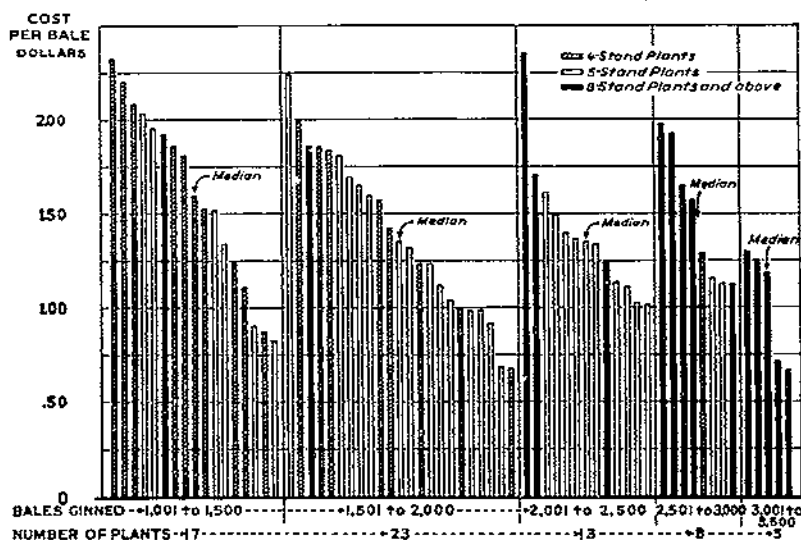


FIG. 10.—VARIATIONS IN LABOR COST, 1924-25

Labor cost of ginning, per bale, for 46 plants of indicated sizes, grouped according to volume ginned. Extreme variations in cost appear in all groups regardless of size of plant.

significance here. The causes of variations are principally, no doubt, the quantity of labor employed and the efficiency with which it is used. Kind of power is one factor in determining the amount of labor needed; labor-saving devices in pressing and in weighing and handling the pressed bale and the number of men used at the suction are also factors which greatly influence variations in total quantity of labor used.

MANAGEMENT COST

Cost of management per bale varied from \$0.34 to \$1.64 in plants with a volume of 1,001 to 1,500 bales, the median for this group being 88 cents and the average deviation 33 cents. (Fig. 11.) Costs for the 23 plants in Group 2 ranged from \$0.29 to \$1.36 per bale, with a median of 92 cents and an average deviation of 26 cents. Medians for the other three groups in order were 69, 70, and 50 cents, and the average deviations 13, 8.5, and 14.5 cents, respectively.

Thus management costs per bale decrease perceptibly with increase in volume, but the variations in individual costs within groups is very marked. Variations in cost of management are due principally to period of employment, rate of compensation, and, in many instances, to the financial interest of the manager in the business.

POWER COST

In Figure 12 the individual power cost of 66 plants is shown according to kind of power and size of plant. Thirty-seven plants used steam power at costs of from 11 cents to \$1.31 per bale, the median cost was 69 cents and the average deviation for this group of plants was 18 cents. Two of these plants appear to have costs which

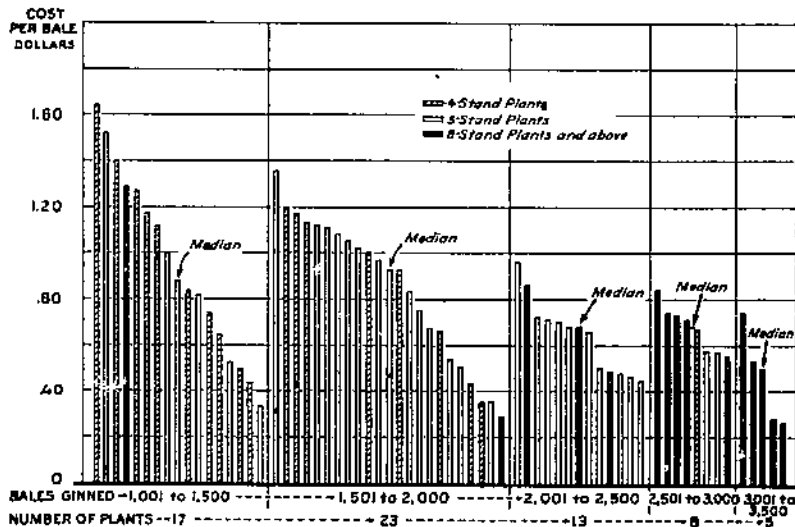


FIG. 11.—VARIATIONS IN MANAGEMENT COSTS, 1924-26

Cost of management, per bale, for 66 plants of indicated sizes grouped according to volume ginned. Variations in management cost were greater for small-volume plants than for those handling large volumes. Gin managers are usually employed in advance for the season, and when volume ginned is less than anticipated the cost per bale is unavoidably high.

are uncommonly low and an examination reveals that one used natural gas for fuel and the other operated only during the peak period. It did not operate during the opening and closing periods when steam power is at its highest cost per bale because of irregular operation. The 22 electric plants had costs which ranged from 58 cents to \$1.31, with a median cost of 95 cents and an average deviation of 14 cents. Six oil-engine plants had costs which varied from 15 to 36 cents per bale, with a median cost of 23 cents and an average deviation of 6 cents.

No account has been taken of volume in this treatment of individual-plant power costs, though it is probably the major influence in causing variations between plants within a group. Some plants use a great deal more power for unloading seed cotton into the cotton house than do others; this of course increases the cost of power for the plants following this practice and probably accounts for part of

the variations between plants. The varying costs of water and fuels used are also factors which cause variations in total power cost per bale.

RELATION OF ITEMIZED COSTS TO TOTAL COST

The average total cost of ginning per bale for 66 plants, 81 gins, was \$5.63. Of this amount, \$0.74 was for management, \$1.39 for labor, \$0.72 for power, \$0.37 for insurance, \$0.11 for taxes, \$0.08 for office supplies, \$1.21 for maintenance, \$0.83 for interest on investment, and \$0.13 for other expenses. These figures are shown in more detail in Tables 18 and 19 and are presented graphically in Figure 13.

The distribution of itemized costs to total cost for the 5-volume groups shows that the costs of management, labor, insurance, main-

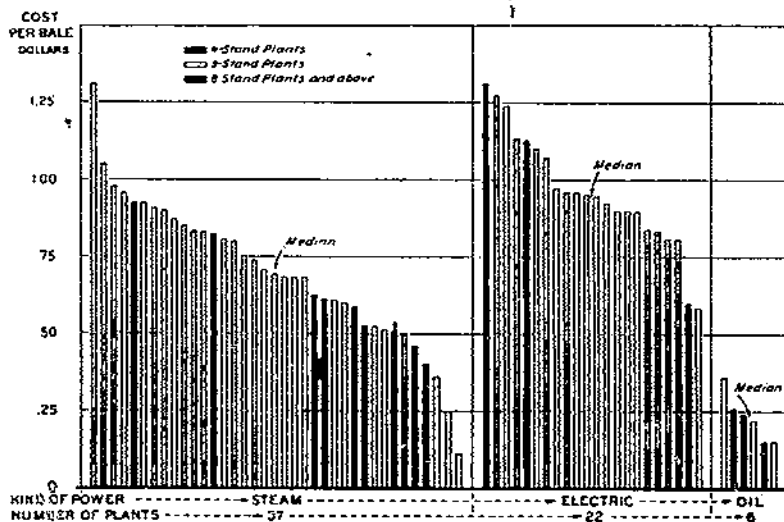


FIG. 12.—VARIATIONS IN POWER COST, 1924-25

Cost of power, per bale, for 37 steam, 22 electric, and 6 oil-engine plants of indicated sizes grouped according to kind of power. Electric-power cost varied less proportionately than either of the other types of power employed.

tenance, and interest on investment decrease perceptibly with increases in volume, whereas power, taxes, and office items either remain about the same or increase. The variations in percentage distribution of itemized expenses for the volume groups do not appear to show a decided tendency in either direction with increase in volume except in the case of taxes, in which an increase was noticeable.

Figure 13 shows that labor is the greatest single expense in cotton ginning and maintenance is the second highest. These two items combined form more than 45 per cent of the total cost. Interest on investment, management, power, insurance, other expenses, taxes, and office expense follow in the order named. Taken collectively, management and labor are about equal to maintenance and interest on investment, each comprising approximately 37 per cent of the total cost. Therefore, these four items form nearly three-fourths of the entire cost of operation.

TABLE 18.—Itemized costs of ginning per bale, by groups, according to number of bales ginned per plant

Bales ginned per plant	Number of plants		Average quantity ginned			Items of cost ¹									
	Number of gins ¹	Per plant	Per gin	Average total per bale ²	Management	Labor	Power	Insurance	Taxes	Office	Maintenance	Interest	Other expense		
														Bales	Bales
1,001 to 1,500.....	17	18	1,300.4	1,228.2	6.963	95.0	157.6	87.1	44.0	0.9	8.2	102.2	117.7	14.7	
1,501 to 2,000.....	23	24	1,734.6	1,662.3	5.738	84.8	138.2	67.6	37.7	7.6	8.0	123.3	90.2	15.6	
2,001 to 2,500.....	13	10	2,180.8	1,770.3	5.431	64.8	130.1	78.2	38.3	11.3	0.6	107.0	80.2	13.7	
2,501 to 3,000.....	8	13	2,794.7	1,719.8	5.131	68.0	147.9	58.1	30.8	14.1	5.6	106.0	75.2	7.4	
3,001 to 3,500.....	5	10	3,268.2	1,634.1	4.581	47.2	102.4	69.7	29.0	15.2	7.5	102.0	77.6	7.5	
Total and average..	60	81	1,957.1	1,594.6	5.620	74.6	138.9	71.9	38.0	10.9	8.1	120.9	88.5	12.0	

¹ Double-battery plants are counted twice.² Averages are weighted by total bales ginned.

TABLE 19.—Itemized costs of ginning per bale as percentages of total cost, by groups, according to number of bales ginned per plant

Bales ginned per plant	Number of plants		Average quantity ginned			Items of cost ¹									
	Number of gins ¹	Per plant	Per gin	Average total cost	Management	Labor	Power	Insurance	Taxes	Office	Maintenance	Interest	Other expense		
														Bales	Bales
1,001 to 1,500.....	17	18	1,300.4	1,228.2	100	13.64	22.62	12.51	6.57	1.42	1.19	23.30	10.91	2.10	
1,501 to 2,000.....	23	24	1,734.6	1,662.3	100	14.78	24.08	11.77	6.33	1.51	21.49	15.72	2.75		
2,001 to 2,500.....	13	10	2,180.8	1,770.3	100	11.94	25.61	14.39	7.05	2.08	1.78	19.80	14.78	2.53	
2,501 to 3,000.....	8	13	2,794.7	1,719.8	100	13.25	28.82	11.32	6.02	2.75	1.09	20.85	14.60	1.44	
3,001 to 3,500.....	5	10	3,268.2	1,634.1	100	10.31	22.36	15.22	6.29	3.32	1.64	22.28	16.95	1.63	
Total and average..	60	81	1,957.1	1,594.6	100	13.23	24.66	12.77	6.50	1.94	1.44	21.48	15.73	2.24	

¹ Double-battery plants are counted twice.² Percentages are computed from total-cost figures.

Volume alone does not appear to be an important factor in influencing the percentage distribution of itemized costs to total cost, but when it is considered in connection with size of plant, that is, quantity ginned per 70 saws, it has a greater significance. Each group according to size of plant (4, 5, and 8 and 10 stands) was sorted into subgroups according to hundredweight ginned per 70 saws, and absolute and relative itemized costs were calculated for each size of plant and for each volume group within the size group. (See Tables 32 to 39, inclusive, in Appendix C and Figure 13.) There was little change within the size groups because of changes in volume. The ratio of labor cost to total cost tends to be a little larger for double-battery plants, and the ratio of power cost to total cost decreases with increase in size of plant and volume. The latter is no doubt due largely to the preponderance of steam-power plants, which appear to operate more efficiently as large units. For 4-stand plants taxes represent 1.2 per cent of total cost, for 5-stand plants, 1.9 per cent, and for double-battery plants, 2.6 per cent. The

proportion that maintenance and interest on investment is of total cost increases slightly, but not strikingly, with increase in size of plant. Taken altogether the percentages for the various cost items do not seem to be affected a great deal by variations in hundred-weight ginned per 70 saws nor by change in size of plant. The ratio of itemized expenses to total cost, with the exception of management and taxes, does not show a marked tendency in either direction with variations in volume and size of plant.

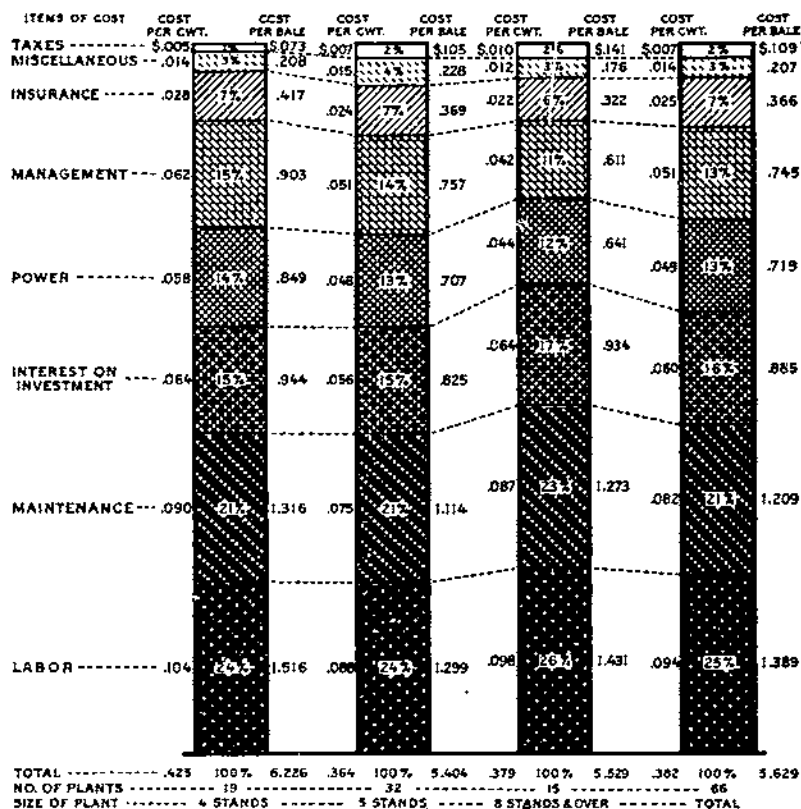


FIG. 13.—ITEMIZED COSTS OF GINNING IN RELATION TO TOTAL COST, 1924-25

Relation of itemized costs to total costs of ginning cotton according to size of plant. Labor is the greatest single expense in cotton ginning and maintenance is the second highest. These two items combined form more than 45 per cent of the total cost. Data for this chart are shown in Tables 32 to 30, inclusive, of Appendix C.

CONTRIBUTION OF CUSTOM-GINNING INCOME TO GINNING COSTS

Out of his income the ginner must pay all of his ginning expenses, hoping that he will have a portion left over as profit. A percentage distribution of income to costs was calculated for each of the 5-volume groups and for all the groups combined. The results of this calculation are shown in Table 20. The plants included in this analysis received a total of \$666,212 for ginning 1,784,719 hundred-weight, or about 120,000 bales of seed cotton. On the other hand, these same plants incurred a total expense of \$681,632 for ginning

this cotton. Therefore, for each dollar received \$1.023 was expended, according to these computations. On the average of every dollar paid for ginning, 13.5 cents went to management, 25.2 cents to labor, 13.1 cents for power, 6.7 cents for insurance, 2 cents for taxes, 1.5 cents for office expenses, 22 cents to maintain the plant, 16 cents for interest on money invested in the plant, and 2.3 cents for all other expenses.

It should be borne in mind that while it appears that the ginner, on the average, expended 2.3 per cent more money than he actually received, this is not necessarily the case because of the inclusion of an allowance for interest on investment as a cost. The ginner who owns his plant does not have to make an out-of-pocket disbursement for interest on capital invested; therefore, instead of losing 2.3 cents for each dollar of custom-ginning income he failed by that amount to make the 16 cents allowed him, in this computation, for interest on his money.

The gin plants with small volumes failed by greater amounts to make the computed allowance for use of capital. For plants ginning 15,001 to 22,500 hundredweight expenses were 125.4 per cent of the income; for those ginning 22,501 to 30,000 hundredweight expenses were 108 per cent of the income; for those in the next three higher volume groups expenses were 93, 92, and 87 per cent, respectively, of the custom income. As might be expected, there was almost without exception a gradual decrease in the percentages for each item of cost with increase in volume and increase in percentage of profit.

TABLE 20.—Percentage distribution of average custom income to itemized ginning costs, by groups, according to hundredweight ginned per plant

Hundredweight ginned per plant	Number of plants	Average quantity ginned per plant	Total cost expressed as percentage of income	Distribution of income ¹										
				Management	Labor	Power	Insurance	Taxes	Office	Maintenance	Interest ²	Other expense	Profit or loss	
15,001 to 22,500	18	18,431.3	125.36	17.39	28.08	15.83	7.90	1.75	1.49	29.16	21.12	2.55	-23.30	
22,501 to 30,000	22	23,557.0	108.06	15.21	26.07	12.56	7.19	1.48	1.70	23.19	17.02	3.04	-8.00	
30,001 to 37,500	13	30,374.3	93.02	11.83	23.32	13.53	6.42	1.93	1.58	18.40	13.60	2.35	8.98	
37,501 to 45,000	8	38,915.7	91.05	11.21	24.28	10.93	5.91	2.95	1.04	19.71	14.04	1.50	8.35	
45,001 to 52,500	5	44,081.2	86.89	10.32	22.50	12.31	4.01	2.27	1.36	18.24	13.82	1.10	13.11	
Total and average	66	27,041.1	102.31	13.54	25.24	13.07	6.65	1.98	1.48	21.97	16.09	2.20	-2.31	

¹ Percentages are computed from total cost figures.

² Interest on investment.

EARNINGS

RELATION OF GINNING COSTS TO CUSTOM INCOME

Average costs per hundredweight and average custom income per hundredweight were brought together for the purpose of ascertaining the amount of profit¹ earned per hundredweight of seed cotton

¹ Profit is the amount earned over and above the allowance made in cost for use of capital, and the term "loss," on the other hand, is used to denote all plants and groups of plants that failed to make a profit after an allowance has been made for interest on investment.

ginned. These data are shown in Table 21 for each of the five volume groups, and in total.

TABLE 21.—Relation of costs and receipts of ginning, by groups, according to hundredweight ginned per plant

Hundredweight ginned per plant	Number of plants	Average quantity ginned per plant	Average cost per hundred-weight ¹	Average receipts per custom hundred-weight ¹	Average profit or loss per custom hundred-weight ¹	Total profit or loss on custom ginning ²	Average quantity custom ginned per plant	Average custom ginning profit or loss per plant ²
		<i>Cwt.</i>	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>	<i>Dollars</i>	<i>Cwt.</i>	<i>Dollars</i>
15,001 to 22,500.....	18	19,226.1	46.9	37.4	-9.5	-31,739.00	18,631.4	-1,767.61
22,501 to 30,000.....	22	25,816.4	39.8	36.9	-2.9	-15,394.00	23,557.0	-696.73
30,001 to 37,500.....	13	32,562.5	35.2	37.8	2.6	10,435.00	30,374.3	802.70
37,501 to 45,000.....	8	41,143.1	33.7	36.7	3.0	9,532.35	38,915.7	1,194.04
45,001 to 62,500.....	5	47,471.2	33.2	38.2	5.0	11,254.75	44,981.2	2,250.95
Total and average....	66	28,846.1	38.2	37.3	-0.9	-15,419.80	27,041.2	-233.63

¹ Averages weighted by hundredweight ginned.

² Slight discrepancy due to apportionment of costs to seed-cotton business for groups and not for individual plants. Unit costs and receipts shown are true group averages.

It is readily seen that on the average plants with a volume of less than 30,000 hundredweight (about 2,000 bales) failed to make a positive return after including an allowance for use of capital in

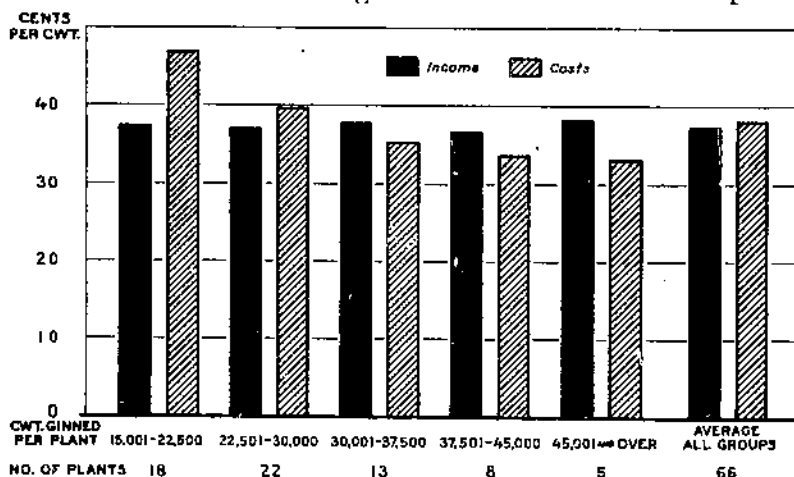


FIG. 14.—INCOME FROM CUSTOM GINNING IN RELATION TO COST, 1924-25

Relation of income and cost by volume groups, according to hundredweight ginned per plant. Average costs for the first two volume groups were greater than income. For the other three groups income exceeded cost. A decrease in cost was evident with each additional increment in volume.

cost, whereas plants with a greater volume made a return in addition to the allowance for interest on investment. The plants in the first group failed by an average of \$1,767 to make a net return; those in the second group by \$700; whereas the plants in Group 3 made an average return of \$803, those in Group 4, \$1,194, and those in Group 5, \$2,251, in addition to an allowance for interest on investment. On the average, the 66 plants failed by \$234 to earn the full amount allowed in the computations for use of capital. The relationship of costs to income for each volume group is shown graphically in Figure 14.

CUSTOM-GINNING PROFITS¹²

The plants with large volumes made money; whereas those with small to medium volumes lost more or less money. These results were all based on group averages. When a distribution of custom-ginning profits is made for all plants and for plants according to size the following results are shown: Sixteen of a total of 19 4-stand plants failed to make a return in addition to the allowance for interest on investment, 16 to 32 5-stand plants failed to make such a return, and 6 of 15 double-battery plants fared likewise. Of the 66 plants studied, 38 failed to make a profit, and 28 succeeded in making a profit after including in cost an allowance for use of capital. These data are presented graphically in Figure 15. The

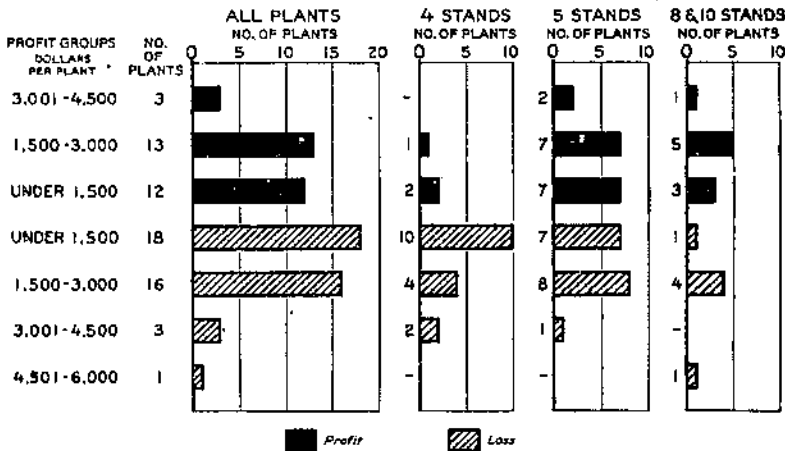


FIG. 15.—CUSTOM-GINNING PROFITS BY SIZE OF PLANT, 1924-25

Custom-ginning profits for all plants and for plants grouped according to size. A higher percentage of the larger-sized plants than of the smaller plants earned profits.

larger-sized plants with their correspondingly larger volumes obviously fared better than the smaller plants.

The largest individual loss,¹² however, was in the case of a double-battery plant which had a very small volume. Had interest on investment not been included as a cost, the above results would have been materially different. A separate compilation excluding interest as a cost shows that only 20 instead of 38 plants would have been loss plants and 46 instead of 28 would have been profit plants.

Profits earned are often meaningless and are sometimes misleading until considered in relation to capital investment. Custom-ginning profits¹² have, therefore, been expressed as percentages of capital invested. (Table 22.) Percentages of profit or loss by groups ranged from -6.87 per cent for plants ginning 1,001 to 1,500 bales to 5.55 per cent for plants ginning 3,001 to 3,500 bales. With interest not included as a cost, only the first group would have shown a net loss and that a loss of less than 1 per cent. The 66 plants had an average investment of \$28,919 and incurred an average net loss of \$204 on custom ginning, which represents a loss of 0.7 per cent on investment.

¹² See footnote 11.

TABLE 22.—Percentage of custom-ginning profit earned on capital investment, by groups, according to number of custom bales ginned per plant

[Profit computed is in addition to 6 per cent for use of capital allowed as a cost. Capital investment represents the amount of capital that would be required to build new plants of similar size and type.]

Custom bales per plant	Number of plants	Average number of custom bales ginned per plant	Average total investment	Average custom-ginning profit or loss per plant ¹	Percentage profit or loss of investment ¹
1,001 to 1,500.....	22	1,261.9	\$25,290.20	-\$1,738.40	-0.87
1,501 to 2,000.....	22	1,738.1	27,529.10	-325.55	-1.18
2,001 to 2,500.....	10	2,181.0	29,273.50	1,004.00	3.43
2,501 to 3,000.....	9	2,737.8	35,010.70	1,631.20	4.54
3,001 to 3,500.....	3	3,272.6	43,537.60	2,418.00	5.55
Total and average.....	66	1,854.2	28,918.80	-203.50	-0.70

¹ A slight discrepancy is due to apportionment of costs to seed-cotton business being made for groups and not for individual plants.

ANALYSIS OF PROFIT PLANTS AND LOSS PLANTS¹⁴

A study and comparison of the plants that lost money and those that made money on custom ginning reveals that the average hundredweight ginned per plant making money was about one-third greater than that per plant losing money, the average quantity ginned in the former case was 35,055 hundredweight and in the latter 24,271 hundredweight. The analysis of the profit plants is shown in Table 23 and that of the loss plants in Table 24. Only 6 plants of the 26 with more than 30,000 hundredweight lost money, whereas 32 plants of the 40 with less than 30,000 hundredweight lost money on custom ginning. The 38 loss plants lost on the average \$1,641, and the 28 profit plants earned \$1,722. Average receipts per custom hundredweight were 1.6 cents higher in the case of profit plants, and this unquestionably was the deciding factor in a few cases as to the group, profit or loss, the plant fell in. Variations in average receipts per custom hundredweight are due to variations in charges in different communities and to varying proportions of bollies and picked cotton, which are ginned at different rates. The ratio between total and custom hundredweight ginned by profit and loss plants is about the same.

TABLE 23.—An analysis of 28 custom-ginning profit plants, by groups, according to hundredweight ginned per plant

Hundredweight ginned per plant	Number of plants	Average quantity ginned per plant	Average quantity custom ginned per plant	Average cost per hundredweight ¹	Average receipts per custom hundredweight ¹	Average profit per custom hundredweight ¹	Total custom-ginning profit ²	Average total profit ²
		<i>Cwt.</i>	<i>Cwt.</i>	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>	<i>Dollars</i>	<i>Dollars</i>
15,001 to 22,500.....	1	22,121.0	21,317.0	34.0	35.7	1.7	370.00	370.00
22,501 to 30,000.....	7	26,174.1	24,662.8	33.5	38.3	4.8	8,366.10	1,195.15
30,001 to 37,500.....	9	32,306.3	30,518.3	33.3	39.1	5.8	15,894.50	1,766.55
37,501 to 45,000.....	6	41,349.6	39,601.3	31.8	37.0	5.2	12,347.70	2,067.95
45,001 to 52,500.....	5	47,471.2	44,981.2	33.2	38.2	5.0	11,257.00	2,251.09
Total and average....	28	35,055.4	33,254.8	32.9	38.1	5.2	48,203.00	1,721.54

¹ Averages weighted by hundredweight ginned.

² A slight discrepancy is due to apportionment of costs to seed-cotton business being made for groups and not for individual plants. Unit costs and receipts shown are true group averages.

¹⁴ See footnote 11.

TABLE 24.—An analysis of 38 custom-ginning loss plants, by groups, according to hundredweight ginned per plant

Hundredweight ginned per plant	Number of plants	Average quantity ginned per plant	Average quantity custom ginned per plant	Average cost per hundredweight ¹	Average receipts per custom hundredweight ¹	Average loss per custom hundredweight ¹	Total custom-ginning loss ²	Average total loss ²
		<i>Cwt.</i>	<i>Cwt.</i>	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>	<i>Dollars</i>	<i>Dollars</i>
15,001 to 22,500.....	17	19,055.7	18,473.4	47.7	37.5	10.2	32,185.55	1,893.27
22,501 to 30,000.....	15	25,040.4	23,041.0	42.5	30.1	6.7	23,249.00	1,549.80
30,001 to 37,500.....	4	33,133.7	30,065.2	39.4	35.0	4.4	5,248.20	1,312.05
37,501 to 45,000.....	2	49,623.5	36,859.0	39.4	35.9	3.5	2,575.00	1,287.50
Total and average..	38	24,270.8	22,462.7	43.8	36.5	7.3	62,340.30	1,640.53

¹ Averages weighted by hundredweight ginned.

² A slight discrepancy is due to apportionment of costs to seed-cotton business being made for groups and not for individual plants. Unit costs and receipts shown are true group averages.

SEED BUSINESS

The ginner performs the service of assembling, in the marketing of cottonseed, for it is a common practice of the grower to sell his seed and settle his ginning charges in the same transaction. Estimating that on the average the seed cotton ginned to make a bale produces 850 pounds of seed, it has been calculated that the ginner buys about 77 per cent of the seed resulting from his custom ginning. This means that as a rule a ginning business can depend upon handling about three-fourths of the seed ginned. As a general thing the grower "catches" seed for planting purposes only, and, occasionally, for feeding to cattle. In some communities there are street buyers, but rarely does the grower sell to anyone other than his ginner. The seed business of 50 plants was analyzed, and the figures are shown in Table 25. The plants were sorted into groups according to number of tons bought to determine whether there was a relation between quantities bought and sold and prices paid and received. Apparently there is no relation. If the seed profit is calculated on a custom-bale basis it is seen that, on an average, the ginner made 91 cents for each bale ginned for customers. The average price paid the grower in each of the volume groups was practically the same, owing to the fairly well-organized market for seed in this area. Quoted prices were followed closely during this particular year, and as a result price differences between communities were not very marked.

TABLE 25.—An analysis of the seed business of 50 cotton-ginning plants, by groups, according to tons of seed bought per plant

Tons of seed bought	Number of plants	Number of bales custom ginned	Quantity of seed bought	Total amount paid	Price paid per ton ¹	Quantity sold	Total amount received	Price received per ton ¹	Total seed expense	Total profit	Profit per ton sold ¹	Profit per custom bale ¹
			<i>Tons</i>	<i>Dolls.</i>	<i>Dolls.</i>	<i>Tons</i>	<i>Dolls.</i>	<i>Dolls.</i>	<i>Dolls.</i>	<i>Dolls.</i>	<i>Dolls.</i>	<i>Dolls.</i>
201 to 400.....	9	9,580	2,647.8	88,689	33.49	2,630.5	98,451	37.43	2,259	7,504	2.85	0.79
401 to 600.....	14	21,695	6,989.2	234,039	33.48	7,125.2	265,332	37.24	7,723	23,570	3.31	1.09
601 to 800.....	16	30,167	10,786.5	361,464	33.51	10,854.9	394,903	36.38	11,698	21,741	2.00	.72
801 and above.....	12	32,528	11,541.0	384,901	33.35	11,542.0	426,582	36.96	9,303	32,378	2.81	1.00
Total and average	50	93,910	31,064.5	1,069,092	33.45	32,152.6	1,185,268	36.86	30,963	85,193	2.45	.91

¹ Averages are weighted by quantity ginned.

BAGGING AND TIES

Ginning is not complete until the bale has been pressed and wrapped; therefore, for every bale ginned a pattern of bagging and ties must be bought and sold. The ginner is almost invariably a dealer in this necessity and, naturally, in most cases receives a profit for performing this service. An analysis of the purchases and sales of bagging and ties is shown in Table 26 by groups according to number of custom bales ginned per plant. There does not seem to be any tendency for costs to decrease with increase in volume; small plants appear to be able to buy at about the same prices as large plants. The average cost of bagging and ties delivered to the plant for 135,272 patterns was \$1.05 per pattern, and of this number 122,401 were sold to customers at an average price of \$1.39, which resulted in a profit of 34 cents per pattern or for each custom bale ginned. The cost of bagging and ties varies a little for individual plants and for groups of plants because of a number of factors. Some plants use a heavier wrapping than others, some are located a greater distance from the railroad and consequently incur a larger drayage cost, and some buy in larger quantities and at a more opportune season than do others. The profit derived from the sale of bagging and ties amounted to about 32 per cent on those sold.

TABLE 26.—An analysis of the purchases, sales, and profits of bagging and ties, by groups, according to bales ginned per plant

Bales custom ginned	Number of plants	Total number of bales custom ginned	Average number of bales custom ginned	Total number of patterns purchased	Total cost of patterns	Average cost per pattern ¹	Number of patterns sold to customers ¹	Total amount received	Average receipts per pattern ¹	Total profit on patterns sold ²	Average profit per pattern (bale) ¹
1,001 to 1,500.....	22	27,882	1,267	33,649	\$33,768	1.063	27,962	\$40,020	\$1,430	\$10,260	\$0.367
1,501 to 2,000.....	22	38,238	1,738	40,797	42,182	1.034	38,238	53,570	1,401	14,033	.367
2,001 to 2,500.....	10	21,683	2,168	24,692	27,423	1.069	21,722	29,315	1,349	5,452	.251
2,501 to 3,000.....	9	24,838	2,760	26,226	27,494	1.048	24,641	33,876	1,375	8,058	.327
3,001 to 3,500.....	3	9,818	3,272	9,911	16,300	1.039	9,818	13,889	1,415	3,662	.374
Total and average.....	66	122,459	1,855	135,272	142,860	1.056	122,401	176,676	1,394	41,372	.338

¹ Averages weighted by bales ginned.

² Discrepancy between patterns bought and patterns sold to customers is due to sales to other gins at cost, patterns used in wrapping bought cotton, and stocks on hand.

³ Discrepancy between profits and receipts minus costs arises from situation described in footnote 2.

SEED-COTTON BUSINESS

Seed cotton is bought by ginners in quantities which vary in amount from a few pounds to a bale. The ginner usually evaluates the seed cotton offered for sale on a basis of the market price of lint cotton and in terms of the possible turnout of lint. Many ginners sort their seed-cotton purchases according to staple, color, and foreign-matter content and thus gin out fairly uniform bales of lint which sell to much better advantage. Data covering the seed-cotton business of 48 plants have been analyzed and are presented in Table 27. It appears that plants that buy small quantities of seed cotton, mostly remnants, make a large unit profit on

seed-cotton purchases, but the plants that make more of a business of buying seed cotton work on a narrower margin.

TABLE 27.—An analysis of the seed-cotton business of 48 cotton-ginning plants, by groups, according to quantity of seed cotton purchased per plant

[All averages except average quantity purchased are weighted according to quantity]

Hundredweight purchased per plant	Number of plants	Total quantity purchased	Average quantity purchased	Average cost per hundred-weight	Average receipts per hundred-weight of seed cotton bought ¹	Average gross margin per hundred-weight bought	Average total expense per hundred-weight bought ²	Average profit per hundred-weight bought	Average profit per bale bought
		<i>Cwt.</i>	<i>Cwt.</i>	<i>Dollars</i>	<i>Dollars</i>	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>	<i>Dollars</i>
1 to 2,000.....	20	24,852	955.8	5.972	6.997	102.5	48.6	53.9	9.563
2,001 to 4,000.....	14	39,415	2,815.5	5.673	6.398	72.5	49.7	22.9	4.368
4,001 and over.....	8	56,104	7,013.0	6.628	7.276	61.8	46.7	18.1	3.128
Total and average..	48	120,371	2,507.8	6.180	6.931	75.1	48.1	27.0	4.863

¹ Average receipts from sale of lint and seed per hundredweight of seed cotton bought.

² Expense for ginning, bagging and ties, drayage, etc.

³ 436.75 hundredweight of seed cotton was sold as seed cotton and is included in sale of seed and lint.

COTTON BUSINESS

Twenty of the plants studied purchased baled cotton: 10 purchased from 1 to 600 bales, 6 purchased from 601 to 1,200 bales, and 4 purchased from 1,201 to 1,800 bales. In all, 13,304 bales were bought. As it was impossible to get accurate data for pounds of cotton handled, the bale is the unit used in analyzing the cotton business. The data are given in Table 28. The 20 plants paid an average price of \$116.86 per bale and sold at \$115.78, losing an average of \$1.08 per bale. The plants buying smaller quantities, a bale now and then, seem to have paid a slightly higher price and also to have received a higher price. It is possible that these plants bought and sold immediately; whereas, in cases where large quantities were bought, there may have been a tendency to speculate, resulting in this particular year in losses. The buying of baled cotton as a part of the ginning business is not common in the area studied. In many cases a bale is bought merely as an accommodation to the grower. If a bale is partially burned during ginning, it is not uncommon for the ginner to buy that bale and make a fair settlement for the loss suffered by the customer.

TABLE 28.—An analysis of the cotton business of 20 gin plants, by groups, according to number of bales bought per plant

[Averages are weighted by number of bales purchased]

Bales bought	Number of plants	Total number of bales bought	Total cost	Average cost per bale	Total sales	Average receipts per bale	Total net loss	Average net loss per bale
1 to 600.....	10	636	\$112,525	\$120.22	\$111,451	\$119.07	\$1,074	\$1.147
601 to 1,200.....	6	5,991	703,005	117.34	698,698	116.62	4,317	.721
1,201 to 1,800.....	4	6,377	739,221	116.02	739,236	114.51	9,985	1.469
Total and average..	20	13,304	1,554,751	116.86	1,540,375	115.78	14,376	1.081

TOTAL BUSINESS

To present the ginning business in its entirety and to visualize it in its true perspective, the profits¹⁵ are now given in total for the various departments. A distribution of total ginning profits is shown in Figure 16 for all plants and for plants according to size. This summary includes the custom-ginning profits of 66 plants, the bagging and ties profits of 66 plants, the seed profits of 57 plants, the seed-cotton profits of 55 plants, and the baled-cotton profits (actually losses in most cases) of 20 plants.

It is pointed out here that the distribution of plants according to total profits is slightly influenced because the data are not exactly comparable for all plants. All the plants handled seed, but it was impossible to get the data for nine plants. Unquestionably the in-

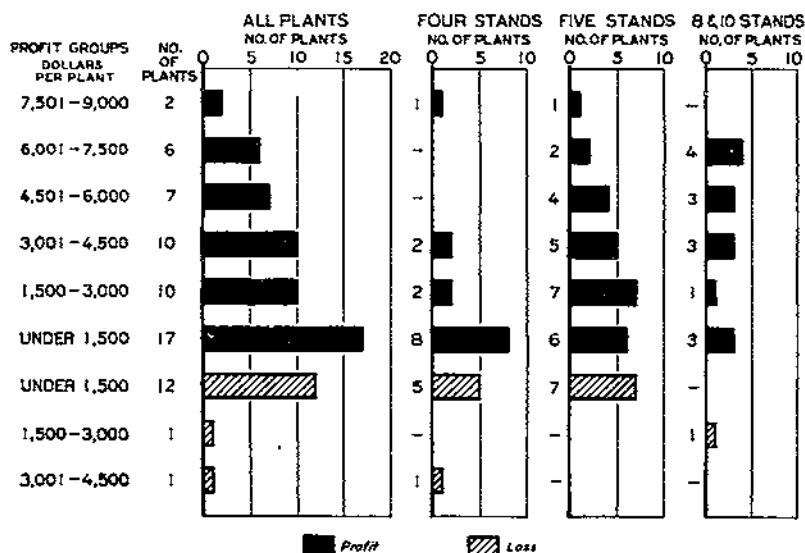


FIG. 16.—TOTAL GINNING PROFITS BY SIZE OF PLANT, 1924-25

Total ginning profits of all plants and of plants grouped according to size. A larger percentage of small plants than of large plants incurred losses.

clusion of the seed businesses of these nine plants would affect the position of other plants in the frequency distribution. An inspection of these nine plants showed that only one incurred a loss, and that a loss of only \$113; therefore, had seed profit been included, this plant would no doubt have been a profit plant instead of being a loss plant.

The data covering the seed-cotton business were not available in 11 cases; 2 plants showed losses if seed cotton was omitted; 1 of these was the one mentioned above under seed, and the other had a loss of \$1,029. It is doubtful if the addition of seed-cotton profits would have sufficed to make the latter a profit plant. Of the 20 plants doing a baled-cotton business, 14 lost money in cotton. Five of these are loss plants in the tabulation of total profits. Figure 16 shows

¹⁵ See footnote 11.

that 14 plants of a total of 66 lost money doing a ginning business. But if the plant that had both seed and seed-cotton profits omitted from total profits is taken into consideration only 13 plants, or 20 per cent of the total number, lost money. The frequency distribution, in spite of the slight discrepancy, is approximately accurate in showing the amount of the losses and profits for individual plants. A 4-stand plant had the greatest loss, and one 4-stand and one 5-stand plant comprise the highest profit group—\$7,501 to \$9,000.

Inasmuch as cotton is not commonly traded in by ginners and a high percentage of those plants buying cotton lost money during the year studied, a separate frequency distribution of total profits, exclusive of cotton, was made. Only 11 plants, or 16 $\frac{2}{3}$ per cent of the total number, lost money if the trading in cotton is disregarded.

As in the case of custom ginning it is necessary to relate total profits to capital invested to get a true picture of the total returns of a ginning business. Fifty-three plants made an average net profit of \$2,439 on an investment of \$28,107, and on a percentage basis this is a profit of 8.68 per cent of the investment (Table 29). Had interest on investment not been included as a cost, the total average earnings would have represented 14.68 per cent of the capital.

TABLE 29.—Ginning profit¹ earned on capital investment,² by groups, according to bales ginned per plant

Bales ginned per plant	Number of plants	Average number of bales ginned	Average total investment	Total ginning profit ³	Percentage of profit on investment	Average investment per bale ginned ⁴
1,001 to 1,500.....	14	1,283.7	\$26,020.10	\$371.40	1.43	\$20.28
1,501 to 2,000.....	19	1,733.0	25,857.80	2,088.10	8.08	14.91
2,001 to 2,500.....	12	2,182.3	29,018.90	3,619.60	12.47	13.30
2,501 to 3,000.....	5	2,703.8	31,412.60	4,879.60	15.53	11.24
3,001 to 3,500.....	3	3,226.3	42,886.60	5,519.60	12.87	13.29
Total and average.....	53	1,900.9	28,106.70	2,438.90	8.68	14.78

¹ Profit computed is in addition to 6 per cent for use of capital allowed as a cost.

² Capital investment represents the amount of capital that would be required to build new plants of similar size and type.

³ Total ginning profit does not include profits and losses from dealing in cotton.

⁴ Average investment per bale ginned is weighted by number of bales ginned.

The average capital invested per bale ginned ranges from \$20.28 in the first group to \$11.24 in the fourth group, with an average for all groups of \$14.78. This amount is approximately two and one-half times the average amount received for ginning a bale.

A distribution of the total percentage profits earned on capital invested by the 53 ginning businesses is shown in Table 30. About 17 per cent of the plants failed to make a positive return, and 66 per cent made 10 per cent or less in addition to the allowance for use of capital.

TABLE 30.—Distribution of 53 ginning businesses according to percentage of profit earned on capital invested (interest on investment included in cost)

Percentage of total ginning profit on capital investment ¹	Number of plants	Cumulative percentage	Percentage of total ginning profit on capital investment ¹	Number of plants	Cumulative percentage
-5.00 to -4	3	5.7	18.01 to 20	1	90.8
-3.99 to -2	1	7.5	20.01 to 22	1	98.7
-1.99 to 0	5	17.0	22.01 to 24	1	99.0
0.01 to 2	4	24.5	24.01 to 26	2	94.3
2.01 to 4	5	31.0	26.01 to 28	1	96.2
4.01 to 6	8	45.3	28.01 to 30		
6.01 to 8	3	50.9	30.01 to 32		
8.01 to 10	8	68.0	32.01 to 34	1	98.1
10.01 to 12	3	71.7	34.01 to 36		
12.01 to 14	4	79.2	36.01 to 38	1	100.0
14.01 to 16	2	83.0			
16.01 to 18	1	84.9	Total	53	100.0

¹ Profits from custom ginning, bagging and ties, seed and seed cotton, after an allowance of 6 per cent is made for interest on capital invested. Cotton profits were excluded in the above table as only 10 of the 53 plants handled cotton. Had cotton profits been included, however, one plant would have shown a loss of about 13 per cent, and otherwise the distribution would have remained approximately the same.

CONCLUSIONS

In the last two decades the ginning industry has undergone a number of highly significant changes. The trend is definitely toward fewer but larger and more efficient plants. With 28,358 gin plants in the United States in 1912 and 18,262 in 1925, it is a matter of conjecture as to future developments.

How few plants can adequately serve the cotton growers of the South? The answer to this question naturally hinges on many factors, the optimum size of plant, good roads and fast modes of transportation, improved and additional gin service in the larger plants, new marketing systems, and in the final analysis, the grower's evaluation and demand for the kind of service that returns to him the largest net profit.

The ginners themselves are in a more favorable position to influence the trend of the industry than any other group, for if gin service is to be improved they will be the ones to improve it. By keeping their plants modern in all respects, and operating for profit, and at the same time for a satisfied patronage, optimum results are practically assured. To do this, however, ginners must be alert and give greater attention to the factors which influence operating and managerial efficiency. Too often ginners have subordinated the best interests of their customers in the rush to get a greater quantity of cotton ginned, and the results have been damaged lint and a heavy monetary loss to the grower.

The day has come when the ginner must gin in the light of spinner demands, thereby giving his customer the highest form of service. To render this service, ginners must study intelligently the staples and classes of cotton and the influence of different cleaning and ginning methods on them. It is not improbable that in the near future there may be "ginners' schools" to give instruction in ginning methods.

So many factors are involved in efficient gin operation that it is deemed unwise to attempt to establish any rule-of-thumb procedure for ginners to follow. The cost records kept by the average ginner are, as a rule, very elementary, but most ginners have a fair idea as to the amount of most of their major costs. Individual ginners may, therefore, be able to compare their costs with group costs shown in this study, to determine their relative position in the group. The value of the figures presented will accrue to the individual who takes time to interpret them in the light of the problems of his own situation.

Individuals or groups of individuals who plan to engage in the ginning business will find it to their interest to ascertain in advance the potential and actual cotton production of the community and the proportion of the crop they can reasonably expect to gin. With this information as a basis, adequate ginning facilities can be erected or acquired, and plans can be made so that efficient operation may result in maximum returns to those interested.

The data used in this study are for a year that was considerably better than average, and the total profits earned must not be accepted as representative over a period of years. As will be recalled, the 12-year average volume for gin plants in Dallas County, Tex., was 1,155 bales, and in Ellis County, Tex., 1,412 bales, and the average bales ginned per plant embraced in this study (1924-25) was about 1,900.

The engagement of the ginner in certain side lines like the purchase of baled cotton has occasionally been criticized. Custom ginning is the real basis of the ginning business. Its success as measured in efficient and economic service should not become dependent upon speculative enterprises. In this study no such general tendency has been revealed, but it is known that in times past ginners have engaged rather recklessly in the buying and selling of seed and cotton, in many cases holding them in a speculative way. The ginner's principal business is to render good gin service to the cotton growers of his community. He should devote more time to an improvement of this service.

APPENDIX A

METHOD OF DETERMINING COST OF MAINTENANCE

It is a common practice among gin managers to consider most of their minor replacements and in many cases major replacements as repairs and charge them to repairs account. Obviously, this presents a rather difficult accounting problem in a determination of ginning costs. In following such a policy the cost of repairs is increased and the amount of depreciation actually sustained for a given year is decreased. The long-time result is probably a lengthening of the life of the plant. The degree in which the cost of repairs is increased and depreciation decreased is dependent directly upon the extent to which this practice is followed. Ordinarily, the thing to do in a case of this kind would be to audit each debit to repairs, separate replacements and additions therefrom, and place them in their proper accounts. But, unfortunately, such records as will yield this information are rarely available. It becomes apparent that to utilize the cost-of-repair data as they are, some arbitrary method must be evolved which will give approximately the average cost of repairs over a period of years. If a satisfactory and reliable average can be obtained, it may be combined with depreciation to give average annual maintenance.

The costs of repairs as reported by 49 single-battery 4 and 5 stand plants in the area studied were used to find an average cost of repairs to apply in the case of single-battery plants. The range in cost for these gins was very great, the lowest amount reported being \$238 and the highest \$1,736. All of these gins operated under similar conditions, and the average obtained from them is used only as representative for gins in that area. The term of operation of these gins varies from 1 year to as long as 20 years. Naturally, during this particular year some of them had very low expenditures for repairs (so called), whereas others, no doubt, had comparatively high costs. In other words, the history of a number of gins for one year might accurately reflect what would be the history of one gin for a period of years. It is on this theory that average expense for repairs is grouped with depreciation (an estimated average covering the life of the plant) to obtain average maintenance cost. Fifteen double-battery plants (8 and 10 stands) were used in finding a similar average for double batteries. The results of this procedure indicate for single-battery gins an average yearly cost of \$761 for repairs and for double batteries, \$1,121. These figures were substituted for those reported by individual gins and were combined with depreciation to give cost of maintenance.

The rate of depreciation for a given plant is influenced abnormally by the inclusion of replacements in the repairs account. There is no scientific method of evaluating this influence and discounting it. The best that can be done is to estimate it and alter the normal depreciation rate accordingly. So far as has been ascertained, there

is no really authentic source for a proper depreciation rate on cotton-ginning machinery. All authoritative tables of rates of depreciation appear to have failed to list this type of machinery.

Considering the manner in which the repairs account is constituted and has had to be used in this study, a depreciation rate of 5 per cent on ginning machinery is estimated to be about in line with normal wear and tear and obsolescence not taken care of in repairs. The depreciation rates used for other classes of gin property are those used by Nicholson and Rohrbach¹⁰ and are as follows:

Buildings:

Wood and galvanized iron, 5 per cent.

Power plant:

Steam, 6 per cent.

Gas and oil engines, 7.5 per cent.

Motors, 5.5 per cent.

APPENDIX B

CAPITAL INVESTMENT OF GIN PLANTS

A number of efforts were made to obtain the capital investment of the gin plants embraced in this study. The schedules used in collecting the data called for the original cost of plants by their main divisions, for replacements and additions, the type of construction, the ginner's estimate of the life of each of the main divisions, and other pertinent data. In most instances reliable data were not available in sufficient detail to enable one to compile the investment for any given year. The date of erection varied greatly, and it was readily seen, in view of the tremendous price changes during the past 10 years, that had the above data been available it would have proved unsatisfactory as a basis for a comparative cost analysis. This first effort to place the study on an individual plant-cost basis was therefore unsuccessful.

Many of the larger plants had had appraisals made during the last few years. It was thought that these appraisals might furnish a basis for ascertaining capital investments for the year 1924-25. An investment schedule was prepared and mailed out to each of the co-operating gins with the request that the gin manager, in lieu of a professional appraisal, make an appraisal of his own plant. The returns indicated that there was too large a discrepancy in the replacement costs of plants of identical size to justify the use of these figures.

When these two possibilities had been exhausted, the leading manufacturers of ginning machinery were requested to prepare a schedule of approximate reproduction costs of modern gin plants adapted to ginning conditions in central and north-central Texas. The schedule shows itemized costs by size of plant for buildings, machinery and equipment, and power plant. The costs of different kinds of power plants are also shown—steam, motors, and oil engine. Charges for depreciation and interest on investment have been based on this schedule of reproduction costs. The schedule is shown in Table 31.

¹⁰NICHOLSON, J. L., and ROHRBACH, J. F. D. COST ACCOUNTING. 570 p. New York. 1919.

TABLE 31.—Schedule of approximate costs of modern gin plants adapted to central and north Texas conditions¹

Classes of property	Size of plant ²							
	4-70	4-80	5-70	5-80	6-70	6-80	10-70	10-80
Buildings.....	\$0, 000	\$6, 000. 00	\$6, 800	\$6, 800	\$7, 150	\$7, 150	\$7, 490	\$7, 400
Machinery and equipment (in- stalled).....	12, 450	13, 700. 55	14, 203	15, 750	23, 500	26, 700	27, 300	30, 500
Fire and extra equipment.....	300	300. 00	300	300	350	350	350	350
Power plant (installed):								
Steam.....	4, 150	4, 150. 00	4, 895	4, 895	8, 300	8, 300	9, 790	9, 790
Oil engine.....	7, 699	7, 699. 00	9, 215	9, 215	15, 338	15, 338	18, 430	18, 430
Motors.....	2, 160	2, 160. 00	2, 378	2, 378	3, 533	3, 533	3, 530	3, 030
Total investment (exclusive of land):								
Steam.....	23, 700	24, 816. 55	26, 108	27, 745	33, 300	42, 500	44, 840	48, 040
Oil engine.....	27, 210	28, 365. 55	30, 518	32, 065	46, 388	49, 508	53, 480	56, 080
Motors.....	21, 710	22, 826. 55	23, 679	25, 226	34, 533	37, 733	38, 980	42, 180

¹ Compiled from estimates of manufacturers of cotton ginning machinery and professional gin appraisers.

² Size is expressed in number of stands and number of saws per stand, for example, a 4-70 plant has four gin stands of 70 saws each.

It is readily apparent that the costs for depreciation and interest on investment as computed on the above basis are in many cases slightly higher than the costs actually sustained by the gin plants under study. Obviously, a ginning business established prior to 1914 did not make the same capital investment as the one started in 1920. But the ginning business starting to-day will have to consider the opportunity for profit on the basis of the present necessary capital investment. For a few years, at any rate, the individual entering the ginning business now will be at a slight disadvantage, perhaps, with the individual who made his start when prices of gin plants were relatively lower. This apparent disadvantage in capital investment is offset to a large extent by the greater good will usually accorded a new and modern plant.

The elements of cost that have to do with depreciation and interest on investment in this study are as for new plants operated for only one season.

APPENDIX C

MISCELLANEOUS TABLES

TABLE 32.—Itemized costs of ginning per hundredweight, by groups, according to hundredweight ginned per plant

[All cost averages are weighted by hundredweight ginned]

Hundredweight ginned per plant	Number of plants	Number of gins ¹	Average quantity ginned		Average total cost	Items of cost									
			Per plant	Per gin		Man- age- ment	Labor	Power	Insurance	Taxes	Oil	Main- tenance	Interest	Other ex- pense	
															Cwt.
15,001 to 22,500	18	1919	226.1	18, 214. 2	46. 9	6. 5	10. 5	5. 9	3. 0	0. 7	0. 6	10. 9	7. 9	0. 9	
22,501 to 30,000	22	2325	816. 4	24, 683. 9	39. 5	5. 6	9. 8	4. 6	3. 0	. 5	. 6	8. 0	6. 4	1. 1	
30,001 to 37,500	13	1632	562. 5	26, 457. 0	35. 9	4. 5	8. 8	5. 1	3. 0	. 4	. 7	7. 0	5. 2	. 9	
37,501 to 45,000	8	1341	143. 1	25, 318. 5	37. 1	4. 1	8. 9	4. 0	3. 0	1. 1	. 4	7. 2	5. 2	. 6	
45,001 to 52,500	5	1047	471. 2	23, 735. 0	33. 2	3. 9	8. 0	4. 7	1. 9	. 9	. 5	7. 0	5. 3	. 4	
Total and average	66	8128	816. 1	23, 561. 5	38. 2	5. 1	9. 4	4. 9	2. 5	. 7	. 6	8. 2	6. 0	. 8	

¹ Double-battery plants are counted twice.

TABLE 33.—Percentage of itemized ginning costs per hundredweight, by groups, according to hundredweight ginned per plant

[Percentages are computed from total-cost figures]

Hundredweight ginned per plant	Number of plants	Number of gins	Average quantity ginned		Average total cost	Items of cost									
			Per plant	Per gin		Management	Labor	Power	Insurance	Taxes	Office	Maintenance	Interest	Other expenses	
															P. ct.
15,001 to 22,500	18	10	10, 226.3	18, 214.2	100	13.87	32.40	12.63	6.37	1.40	1.10	23.20	16.85	2.03	
22,501 to 30,000	22	13	25, 816.3	24, 603.9	100	14.08	24.68	11.63	6.64	1.37	1.58	21.47	15.74	2.81	
30,001 to 37,500	13	8	32, 592.4	26, 457.0	100	12.72	25.07	14.55	6.91	2.07	1.69	19.78	14.68	2.53	
37,501 to 45,000	8	5	41, 143.1	25, 318.8	100	13.25	28.82	11.32	6.02	2.75	1.03	20.65	14.66	1.44	
45,001 to 52,500	5	3	47, 471.2	23, 735.6	100	11.87	25.96	14.17	5.66	2.61	1.53	21.01	15.90	1.26	
Total and average	66	81	28, 816.1	23, 534.2	100	13.24	24.86	12.77	6.50	1.94	1.44	21.48	15.73	2.21	

† Double battery plants are counted twice.

TABLE 34.—Itemized costs of ginning per hundredweight for 4-stand plants, by groups, according to hundredweight ginned per 70 saws

[All cost averages are weighted by hundredweight ginned]

Hundredweight ginned per 70 saws	Number of plants	Average quantity ginned per 70 saws	Average total cost per hundredweight	Items of cost									
				Management	Labor	Power	Insurance	Taxes	Office	Maintenance	Interest	Other expenses	
3,001 to 4,000	2	3, 602	50.3	5.5	14.7	6.8	4.3	0.9	0.7	13.1	9.4	0.6	
4,001 to 5,000	8	4, 520	44.4	6.1	9.9	5.9	2.9	.6	.8	10.2	7.4	.8	
5,001 to 6,000	6	5, 424	42.0	6.7	10.3	5.5	3.1	4	7	8.5	6.1	.7	
6,001 and over	3	7, 356	35.5	5.6	9.6	5.8	2.0	4	4	6.2	4.4	1.1	
Total and average	19	5, 137	42.5	6.2	10.4	5.8	2.8	.5	.6	9.0	6.4	.8	

TABLE 35.—Percentage of itemized costs of ginning per hundredweight for 4-stand plants, by groups, according to hundredweight ginned per 70 saws

[Percentages are computed from total-cost figures]

Hundredweight ginned per 70 saws	Number of plants	Average quantity ginned per 70 saws	Total cost per hundredweight	Items of cost									
				Management	Labor	Power	Insurance	Taxes	Office	Maintenance	Interest	Other expense	
3,001 to 4,000	2	3, 602	100.0	10.22	26.19	12.10	7.66	1.50	1.18	23.18	16.75	1.13	
4,001 to 5,000	8	4, 520	100.0	13.83	22.46	13.25	6.51	1.33	1.25	22.96	16.56	1.85	
5,001 to 6,000	6	5, 424	100.0	15.92	21.63	13.64	7.28	.93	1.67	20.35	14.53	1.65	
6,001 and over	3	7, 356	100.0	15.78	26.94	16.36	5.62	1.02	1.18	17.47	12.43	3.20	
Total and average	19	5, 137	100.0	14.51	24.34	13.65	6.70	1.17	1.36	21.13	15.17	1.97	

TABLE 36.—Itemized costs of ginning per hundredweight for 5-stand plants, by groups, according to hundredweight ginned per 70 saws

[All cost averages are weighted by hundredweight ginned]

Hundredweight ginned per 70 saws	Number of plants	Average quantity ginned per 70 saws	Average total cost per hundredweight	Items of cost								
				Management	Labor	Power	Insurance	Taxes	Office	Maintenance	Interest	Other expense
3,001 to 4,000.....	3	3,477	Cents 48.5	Cents 0.5	Cents 9.9	Cents 6.1	Cents 3.9	Cents 0.6	Cents 0.6	Cents 11.6	Cents 8.5	Cents 0.8
4,001 to 5,000.....	9	4,613	40.4	5.8	9.8	4.3	2.3	.8	.5	8.9	6.6	1.8
5,001 to 6,000.....	12	5,587	35.8	5.2	8.9	4.5	2.6	.6	.6	7.3	5.4	.7
6,001 and over.....	8	6,827	31.7	4.2	7.6	5.2	2.2	.9	.5	5.9	4.3	.9
Total and average.....	32	5,418	36.4	5.1	8.8	4.8	2.4	.7	.5	7.5	5.6	1.0

TABLE 37.—Percentage of itemized costs of ginning per hundredweight for 5-stand plants, by groups, according to hundredweight ginned per 70 saws.

[Percentages are computed from total-cost figures]

Hundredweight ginned per 70 saws	Number of plants	Average quantity ginned per 70 saws	Total cost per hundredweight	Items of cost								
				Management	Labor	Power	Insurance	Taxes	Office	Maintenance	Interest	Other expense
3,001 to 4,000.....	3	3,477	100.0	13.44	20.51	12.61	8.92	1.27	1.13	23.84	17.45	1.73
4,001 to 5,000.....	9	4,613	100.0	14.43	21.07	10.57	5.71	1.57	1.25	22.06	16.37	3.96
5,001 to 6,000.....	12	5,587	100.0	14.46	24.89	12.64	7.35	1.58	1.58	20.41	15.13	1.96
6,001 and over.....	8	6,827	100.0	13.11	23.78	10.38	6.88	3.03	1.60	18.56	13.67	2.99
Total and average.....	32	5,418	100.0	14.01	24.04	13.08	6.84	1.94	1.46	20.63	15.25	2.75

TABLE 38.—Itemized costs of ginning per hundredweight for 8 and 10 stand plants, by groups, according to hundredweight ginned per 70 saws

[All cost averages are weighted by hundredweight ginned]

Hundredweight ginned per 70 saws	Number of plants	Average quantity ginned per 70 saws	Average total cost per hundredweight	Items of cost								
				Management	Labor	Power	Insurance	Taxes	Office	Maintenance	Interest	Other expense
2,001 to 3,000.....	1	2,493	Cents 66.5	Cents 8.7	Cents 13.0	Cents 1.6	Cents 4.3	Cents 1.9	Cents 0.9	Cents 19.2	Cents 13.9	Cents 3.0
3,001 to 4,000.....	5	3,823	43.7	4.3	11.1	4.9	2.1	1.0	.7	10.7	8.0	.9
4,001 to 5,000.....	6	4,430	33.6	3.5	8.7	3.7	2.3	1.0	.3	7.9	5.7	.5
5,001 to 6,000.....	3	5,193	35.2	4.7	9.8	5.4	1.8	.7	.8	6.0	5.0	.4
Total and average.....	15	4,199	37.9	4.2	9.8	4.4	2.2	1.0	.0	8.7	6.4	.6

TABLE 39.—Percentage of itemized costs of ginning per hundredweight for 8 and 10 stand plants, by groups, according to hundredweight ginned per 70 saws

[Percentages are computed from total-cost figures]

Hundredweight ginned per 70 saws	Number of plants	Average quantity ginned per 70 saws	Total cost per hundred-weight	Items of cost								
				Management	Labor	Power	Insurance	Taxes	Office	Maintenance	Interest	Other expense
2,001 to 3,000	1	2,493	100.0	13.02	19.47	2.42	6.44	2.79	1.41	28.85	20.97	4.57
3,001 to 4,000	5	3,023	100.0	9.75	25.47	11.23	4.89	2.28	1.53	24.47	18.26	2.12
4,001 to 5,000	6	4,436	100.0	10.35	25.98	11.09	6.84	3.04	1.05	23.52	16.80	1.33
5,001 to 6,000	3	5,103	100.0	13.46	27.92	15.35	5.18	2.03	2.19	18.69	14.11	1.07
Total and average	15	4,100	100.0	11.04	25.87	11.59	5.84	2.55	1.48	22.03	18.89	1.71

APPENDIX D

TEXAS LAWS RELATING TO GINNING¹⁷

The following extracts of laws that affect and govern ginning operations are taken from the civil and penal codes of Texas:

CIVIL CODE¹⁸

ART. 4443. The duties of the commissioner [of Agriculture] shall be as follows:

11. He shall collect and publish statistics and such other information regarding such industries of this State and of other States as may be considered of benefit in developing the agricultural resources of this State. He shall cause a proper collection of agricultural statistics to be made annually; and, to this end, he shall furnish blank forms to the tax assessors of each county before the first of January of each year, including forms as to the acreage in cotton, grain, and other leading products of the State, to be filled out by persons assessed for taxes, together with such instructions as will properly direct said assessor in filling them out. It is hereby made the duty of said tax assessor to return said blanks, with accurate answers, to the commissioner of agriculture on or before the first day of June following. It is further made the special duty of the said tax assessor to forward by registered mail to the commissioner of agriculture lists of the names and addresses of all ginners within their counties when asked to do so by the commissioner. It shall be the duty of the commissioner to furnish to every ginner blank forms for reports, which forms shall be filled out by said ginners as the commissioner may direct, and returned by them to the commissioner. In order to facilitate the collection and collation of accurate information concerning the various subjects treated of in this chapter the heads of the several State departments and of the State institutions are hereby required to furnish accurately such information as may be at their command whenever called upon for same by said commissioner. In the prosecution of his work the commissioner is hereby empowered to enter manufacturing establishments chartered or authorized to do business in this State, and said corporations shall furnish such information as said commissioner may request of them.

12. He shall make and publish such rules and regulations as he may deem necessary to carry into effect the provisions of this chapter.

ART. 7827c. PUBLIC GINS CHARGED WITH PUBLIC USE; LICENSE; BOND; SUITS ON BOND; VENUE; NEW BOND; CONDITIONS OF BOND.—All gins operated in this State, whether by individuals, partnerships, joint-stock companies, or corporations,

¹⁷ TEXAS. LAWS, STATUTES, ETC. COMPLETE TEXAS STATUTES. Civil Statutes, 1677 p.; Penal Code, 311 p.; Criminal Procedure, 195 p. Kansas City, Mo. 1920.

¹⁸ All articles which appear under both the civil and penal codes have been omitted from the material appearing under the heading of the civil code.

ginning cotton for commercial purposes, shall be known as ginners; and shall be charged with the public use; and shall be required to obtain a license as a licensed ginner, from the commissioner, which license shall be renewed each year, upon the payment of an annual fee of one dollar (\$1). Applications for such license shall be made to the commissioner of warehouses, stating the location and amount of capital of the gin, by whom owned, by whom conducted, and the post-office address of the owner and operator. Such application shall be accompanied by a bond in the form prescribed by the board. Such bond may be that of a bonding and indemnity company authorized to do business in Texas, or may be a personal surety bond; and in the event of a personal surety bond, such bond shall be renewed once each year; provided, in no event shall a bond of less than two hundred and fifty dollars (\$250), nor more than one thousand dollars (\$1,000), be required of any one ginner for each gin he may own. Said bond shall be payable to the State of Texas, for the use and benefit of all who may have a cause of action against the maker thereof under the terms and provisions of this act; and suit may be brought thereon against the maker thereof in any court of competent jurisdiction in the name of the aggrieved party, without the necessity of binding the State in the suit; but venue of the suit shall be subject to the general venue statutes of the State. Said bond shall not be void on first recovery but repeated suits may be brought on one bond until the amount of same has been exhausted; and when the bond has become impaired by reason of any judgment thereon, the maker thereof shall be required to give a new bond, or make good the impairment; otherwise, the board shall cancel his license as a public ginner. The conditions and obligations in the bond shall be that the cotton ginned by the gin designated in the bond, and in its application for license, has been carefully ginned, and that no foreign matter or substance has been placed in the cotton, nor has any water or anything that would increase the weight thereof been placed therein during the process of ginning, or thereafter, while the cotton was in possession of the gin; and that the gin will separate the dirt from the seed; and that any sample of cotton taken from the bale during the process of ginning, as provided in this act, is a fair and true sample of the cotton in the bale.

ART. 7827c. SAMPLE FROM COTTON BALES GINNED; CERTIFICATE.—Each licensed ginner, under this act, shall take from each bale of cotton ginned by him one fair, true, and correct sample of cotton, unless requested in writing, by the owner of the cotton, not to do so. When a sample of cotton is taken, such sample shall weigh not less than 4 nor more than 6 ounces; and the ginner shall wrap the same tightly in a sample wrapper, to secure a reasonable degree of compactness. Such sample shall be taken in three draws, as nearly as practicable, representing the parts of a bale. With each sample of cotton there shall be placed a certificate, under the signature of the ginner, that same is a fair and true sample, as far as said ginner may be able to determine, and that the ginner guarantees no fraud was practiced in taking such sample; and that it was taken from the bale in such manner as to secure a correct sample of the cotton in the bale. Whether or not a sample of the bale of cotton so ginned shall be requested and taken by the ginner as provided herein, the ginner shall, nevertheless, place with each bale of cotton ginned by him a certificate guaranteeing under his bond that during the process of ginning, or thereafter, while the cotton was in the possession of the ginner, no water or foreign substance of any nature had been placed in such cotton, with intent to defraud. Such certificate shall bear the name and address of the person for whom the cotton was ginned, the number of the bale on the books of the ginner, and the weight of the bale at the gin. Provided, that any ginner who takes a sample from a bale of cotton, under the provisions of this act, may at his option, take and file a like sample from such bale of cotton, for his own protection under this bond.

ART. 7827d. WRAPPING OF COTTON GINNED; MARKING.—Each bale of cotton ginned by a licensed and bonded ginner in this State shall be so wrapped that the bale will be completely covered when compressed; provided that the ends of the bale shall be closed and well sewed; and, provided further, that the quality of the bagging shall at all times be such that marking thereon will, under ordinary conditions, remain intact and visible. Each and every licensed and bonded ginner shall mark each bale of cotton ginned by him with a metal tag or marker of some indestructible material on which shall be stamped in distinct letters the following "B.—" and "B. G.—," together with the name of the gin or ginner and his post-office address. The manner of marking for identification may at any time be regulated by the

commissioner. The first blank above indicated shall be filled in by the ginner by placing the same number, numerically, as that of the bale, as shown on the books of the gin ginning the same; and the letter "B" shall stand for "bale." The second blank shall be filled in by the ginner, by inserting the number of the gin license assigned to it by the commissioner; and the letters "B. G." when so used, shall stand for "Bonded gin." All laws and parts of laws heretofore enacted, providing for the marking of branded cotton in the bale, are hereby repealed.

ART. 7827d. COMMISSIONER SHALL ENFORCE THE PROVISIONS OF THIS ACT.—The commissioner shall have power and authority, and it shall be his special duty, to enforce the different provisions of this law relating to gimmers, and to regulate and control such cotton gins in all matters relating to the performances of their duties as such.

ART. 7827e. REVIEWING BOARD; CHAIRMAN; MEETINGS; JUDICIAL SUPERVISION.—All matters relating to the issuance of a ginner's license, as in this act provided, and all rules and regulations pertaining to gins, ginning, and gimmers, as authorized and required by any provision or section of this act, shall be subject to review for affirmation, modification, or rejection by a board hereby created, which board shall be composed of the commissioner of agriculture, commissioner of insurance and banking, and the commissioner of markets and warehouses. The last-named commissioner shall be the chairman of said board and shall have the power, and it shall be his duty, to convene said board at all reasonable and necessary times to hear and decide all questions properly coming before it for review and decision. All rules, regulations, and acts of the commissioner of markets and warehouses, or of said board, pertaining to gins, gimmers, and ginning, shall be subject to review by any court of competent jurisdiction in this State.

ART. 7827f. SURETIES ON BONDS; FORM OF BOND; SUIT; VENUE; NEW BOND.—Each kind of bond required by any provisions of this act may be made with private persons or bonding companies as sureties. All such bonds shall be filed with the commissioner and approved by him. All such bonds shall be payable to the State of Texas for the use and benefit of any person who may be damaged by a breach of its conditions, but it shall not be necessary to join the State in any suit on any such bonds. The venue of suits on all such bonds as are provided herein shall be that of the general venue statutes of this State. Should any such bond become impaired, by suit or otherwise, the commissioner may, by a written notice to the maker, require such impairments to be made good. If any such impairment is not made good, to the satisfaction of the commissioner, within a reasonable time after notice, which time shall in no event exceed 30 days, the license under which the maker of such impaired bond has been acting shall then and thereafter stand revoked and canceled.

PENAL CODE

ART. 977m. FALSE PACKING OR FRAUDULENT CERTIFICATE OF CLASSIFICATION.—If any person shall falsely pack any bale of cotton, or other farm products, or give any false or fraudulent certificate of classification or any cotton or other farm produce, with intent to defraud, the person so offending shall be guilty of a misdemeanor and on conviction thereof shall be fined in any sum not less than twenty-five dollars (\$25), nor more than two hundred dollars (\$200).

ART. 977g. COTTON GINNER VIOLATING REQUIREMENTS.—Should any person operating a cotton gin in this State either for himself or for another, fail to do anything required of a ginner under the terms and requirements of this act, or by the rules of the commissioner, such person shall be guilty of a misdemeanor, and on conviction thereof, shall be fined as provided in this act.

ART. 977h. DOING BUSINESS UNDER WAREHOUSE AND MARKETING ACT WITHOUT A LICENSE.—Any person who shall conduct any business for himself or for another, for which a license is required under the terms of this act, without having first obtained such license, shall be guilty of a misdemeanor, and on conviction thereof shall be punished as hereinafter provided.

ART. 977i. DOING BUSINESS UNDER WAREHOUSE AND MARKETING ACT AFTER REVOCATION OF LICENSE.—If a license is issued to any person or association of persons, or a corporation, under authority of this act, and if such license is thereafter canceled or revoked, it shall be unlawful for the licensee therein mentioned to resume or continue to pursue such occupation until a new license is obtained by him, them, or it. The person so offending shall be guilty of a misdemeanor and on conviction shall be punished as herein provided.

ART. 977j. FALSE CERTIFICATE OF SAMPLE.—If any person shall issue, or cause to be issued, any certificate of sample, weight, grade, or class, of any cotton or other farm products, for commercial purposes, with intent to deceive or defraud, such person shall be guilty of a misdemeanor, and on conviction thereof shall be fined in any sum not less than twenty-five dollars (\$25), nor more than two hundred dollars (\$200), and each instrument so issued shall constitute a separate offense.

ART. 977l. SUBSTITUTION OF SAMPLES.—If any person shall substitute any sample of cotton or other farm products for a sample taken under authority of this act, with intent to defraud, he shall be guilty of a misdemeanor and on conviction thereof shall be fined as provided in the succeeding section.

ART. 977h. VIOLATION OF ANY OF THE PROVISIONS OF THE WAREHOUSE AND MARKETING ACT.—From and after this act takes effect, it shall be unlawful for any person to do, or cause to be done, any act or anything prohibited by this act, or to fail to do anything required of him under it. The person so offending shall be guilty of a misdemeanor and on conviction thereof shall be fined in any sum not less than twenty-five dollars (\$25), nor more than two hundred dollars (\$200), unless a different offense and a different penalty is provided by this act.

ART. 978. "PUBLIC GINNER" DEFINED, CERTIFICATE REQUIRED, FORM OF.—All custom ginners of seed cotton in this State are hereby declared to be public ginners. Any person or persons, firm or corporation in this State, before engaging in the business of public ginners, shall obtain from the county clerk of the county in which gin is located a certificate after the following form:

Number -----

This is to certify that ----- of ----- County, Texas, has this day filed affidavit required by law, of all public ginners in this State.

[SEAL]

County Clerk of ----- County, Tex.

ART. 979. FORM OF AFFIDAVIT TO BE MADE.—The form of affidavit to be made to and filed with the county clerk shall be as follows:

I, ----- of ----- County, Tex., do solemnly swear that I will, so long as I may operate a public gin, make and forward a true and correct report of the number of bales of cotton ginned by me to the commissioner of agriculture at Austin, as required by law.

ART. 980. COUNTY CLERK TO ISSUE AND NUMBER EACH CERTIFICATE.—The county clerk shall number each certificate issued by him consecutively, beginning at No. 1; and shall immediately forward to the commissioner of agriculture the name and postoffice address to whom certificate was issued. The clerk shall issue certificates to all ginners, and shall take the affidavits as herein required without cost to ginners.

ART. 981. DUTY OF COMMISSIONER OF AGRICULTURE.—The commissioner of agriculture, upon receipt of information of the issuance of a ginner's certificate from any county clerk in this State, shall immediately forward all necessary blanks to the public ginner for making official cotton report, which shall consist of the following:

Envelopes addressed to the commissioner of agriculture, Austin, Tex.; and there shall be printed upon the upper left-hand corner the words, "Official cotton report of ----- County," also blanks, to wit:

OFFICIAL COTTON REPORT

Certificate No. -----

-----, 190---

COMMISSIONER OF AGRICULTURE,
Austin, Tex.

Sir: This is to certify that I have ginned ----- bales of cotton from the ----- day of ----- 190--, to the ----- day of ----- 190--.

(Signed) -----

ART. 982. PUBLIC GINNER TO FORWARD REPORT TO COMMISSIONER OF AGRICULTURE.—All public ginners shall make and forward reports to the commissioner of agriculture, on the blanks furnished them, by the third of each month, stating the exact number of bales ginned by them the preceding calendar month. This

report must be made by all ginners, unless they have ceased to operate, the notice of which must be forwarded to the commissioner of agriculture. These reports must be securely sealed by ginners.

ART. 983. SHALL OPEN SAME AND GIVE OUT INFORMATION, WHEN.—The commissioner of agriculture shall open, on the 5th of each month, and tabulate the official cotton reports of the various counties, in the presence of three creditable witnesses, who shall be appointed by the governor. The complete report, showing total number of bales of cotton ginned, shall be given out to the public, including the press, at 11 o'clock a. m., on the 9th of each month.

ART. 984. GIVING OUT INFORMATION BEFORE TIME SPECIFIED, PENALTY.—If the commissioner of agriculture, his assistants, or anyone else connected with the opening and tabulating of these official cotton reports, or any other person, shall give out any information, as to the number of bales of cotton ginned, before the time specified by this act, shall, upon conviction, be confined in the penitentiary not less than one year nor more than three years.

ART. 985. COUNTY CLERK OR PUBLIC GINNER VIOLATING ANY PROVISIONS HEREOF, PENALTY.—All county clerks and public ginners who violate any of the provisions of this act are guilty of a misdemeanor, and, upon conviction, shall be fined not less than twenty-five nor more than two hundred dollars.

ART. 986. PERSON, OWNER, ETC., OF PUBLIC GIN SHALL KEEP RECORD.—Hereafter every person, firm, corporation, or association of persons owning, controlling, or operating a public cotton gin in this State shall keep, or cause to be kept, a public record of all cotton brought to them for ginning and packing. Such record shall correctly show the amount of cotton received, date of its receipt, by whom brought to the gin, and the name or names of the party or parties claiming to own the same.

ART. 987. EACH BALE OF COTTON SHALL BE MARKED AND SAME PUT UPON RECORD.—Said ginner, after ginning and packing said cotton, shall place, or cause to be placed, on each bale of cotton, the initials of the party or parties claimed to own said cotton, under which he shall place some private ginner's mark, all of which shall be put upon record in the book before mentioned.

(Acts 1917, ch. 41 (1st C. S. 35th Leg.) sec. 7, ante, art. 7827d, civil statutes, repeals "all laws and parts of laws heretofore enacted, providing for the marking or branding of cotton in the bale.")

ART. 989. PERSON, FIRM, CORPORATION, ETC., FAILING, REFUSING, ETC., TO COMPLY WITH ANY PROVISIONS HEREOF, PENALTY.—Any person, firm, corporation, or association of persons failing, neglecting, or refusing to comply with any of the provisions of this act shall be punished by a fine in any sum not more than twenty-five dollars (§25).

ART. 993a. COTTON GINNERS TO STAMP WEIGHTS UPON BALES.—That the owners, lessees, operators, or receivers of all cotton gins in this State shall stamp or write upon each and every bale of cotton ginned by them, in plain figures, the weight of the bagging and ties in which the cotton is wrapped, said figures to be written or stamped with indelible ink, and shall be not less than 4 inches in height and 3 inches in width, and shall be preceded by the word "tare" written or stamped upon the bale with indelible ink, the letters composing said word to be not less than 4 inches in height and 3 inches in width. Any person willfully violating the provision of this section shall be guilty of a misdemeanor, and upon conviction shall be punished by a fine of not less than ten nor more than one hundred dollars.

(See concluding sentence in acts 1917, ch. 41, sec. 7, ante, art. 7872d, civil statutes, repealing "all laws and parts of laws heretofore enacted providing for the marking or branding of cotton in the bale.")

ART. 993a. SEPARATE OFFENSE.—Each bale of cotton ginned and each bale of cotton compressed without having placed thereon the word and figures as provided in sections 1 and 2, respectively, of this act shall constitute a separate offense.

**ORGANIZATION OF THE
UNITED STATES DEPARTMENT OF AGRICULTURE.**

July 26, 1927

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<i>Assistant Secretary</i>	R. W. DUNLAP.
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