# ANALYSIS OF THE BUSINESS OPERATIONS OF COOPERATIVE COTTON GINS IN OKLAHOMA 1933-34.

By
OTIS T. WEAVER
AND
OMER W. HERRMANN.

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*Operations of*

# Cooperative Cotton Gins in Oklahoma 1933-34

*By* OTIS T. WEAVER *and* OMER W. HERRMANN

FARM CREDIT ADMINISTRATION

*Cooperative Division*

WASHINGTON, D. C.

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Director of Information,
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# *Analysis of the Business Operations of*

# Cooperative Cotton Gins in Oklahoma, 1933-34[1]

THE present cooperative cotton-gin movement in Oklahoma began after the enactment of the cooperative law of 1919 (Compiled Oklahoma Statutes, 1919, art. XIX, ch. 34). Numerous farmer-owned gin companies had been organized prior to that time, and these had some cooperative features.[2] For the most part, however, these organizations were farmers' stock companies that distributed earnings and gave voting privileges to stockholders on the basis of the amount of stock owned by each. As no legal restrictions were placed on the holding or transferring of stock, these companies seldom retained their cooperative characteristics long; the more successful among them were acquired by a relatively few stockholders, many of whom were not farmers; and the less successful eventually were sold or turned over to private concerns or individuals.

Following the establishment of a legal status for cooperative associations, a few of the farmer-owned stock-company gins were reincorporated as cooperatives. For the most part, however, local groups of farmers, in order to gin their cotton cooperatively, organized new associations under the State cooperative law and purchased new plants. Some of the distinctive features of this law were: (1) The

[1] The Department of Agricultural Economics of the Oklahoma Agricultural and Mechanical College cooperated in the collection and tabulation of the data for this study. Special credit is due Roy A. Ballinger, at that time associate professor, Oklahoma Agricultural and Mechanical College, for assistance in preparing the statistics on which parts of this study are based. This analysis is a part of a more comprehensive study which is being continued for the 1934–35 and 1935–36 seasons.

[2] See Fetrow, Ward W. COOPERATIVE MARKETING OF AGRICULTURAL PRODUCTS. Farm Credit Administration Coop. Div. Bull. 3, 106 pp., illus., 1936; see pp. 17–20; *and* Herrmann, O. W. and Gardner, Chastina. EARLY DEVELOPMENTS IN COOPERATIVE COTTON MARKETING. Farm Credit Administration, Coop. Div. Circ. C-101, 46 pp., illus., 1936. See pp. 38–42.

one-man-one-vote principle; (2) a limit of 8 percent on returns from invested capital; (3) the payment of dividends above the returns on capital to patrons on the basis of the amount of business contributed by each; and (4) a limit on the percentage of the total amount of stock outstanding, as well as on the total amount of stock that could be owned by any member.

The cooperative movement was further accelerated during the period 1925–1930 by an aggressive cooperative gin program under the leadership of the Oklahoma Farmers Union, the State division of the Farmers' Educational and Cooperative Union of America. This program resulted in the incorporation of a substantial number of local cooperative gin associations. Members of several of the local associations were also members of the Oklahoma Farmers Educational and Cooperative Union; but each local cooperative gin was separately incorporated, and its operating policies were determined by its own board of directors. Membership was usually restricted to farmers or farm owners.

Cooperative gin associations are primarily processing organizations in that ginning and baling cotton are initial functions. All these associations, however, bought cottonseed from their patrons; most of them bought some of the cotton which they ginned; and several sold farm supplies such as feed, seed, coal, gas, and oil to their patrons.

Cotton ginning is perhaps better adapted to cooperative effort than many other cooperative enterprises. It involves little or no risk because of changes in market price or perishable nature of its products. The marketing of cottonseed, it is true, has become almost inseparable from the ginning business as a result of custom and convenience; but even so, the necessary risks of handling cottonseed are not comparable with the risks associated with the handling of cotton, grains, fruits, vegetables, livestock, and similar commodities.

# Purpose and Method of Study

THIS study was made with two general objectives in view: To make available comparative data on the operations of associations in order to improve their operating efficiency, and to provide specific information that might assist the banks for cooperatives in formulating loan policies to meet both the long-term and the short-term credit needs of local cooperative gin associations.[3]

Stated more specifically, these objectives were to determine: (1) The extent of the development of the cooperative gin movement in Oklahoma, particularly the number of associations and members, the

[3] The Farm Credit Act of 1933 provided for the formation of 12 regional banks for cooperatives. Oklahoma is served by the Bank for Cooperatives of Wichita, Kans.

volume of cotton ginned, the investment in gin plants, and the equity of the members in these associations; (2) the important factors influencing the expense of ginning cotton by cooperatively owned plants; (3) the sources of income of cooperative cotton gins; (4) the important factors influencing income; (5) the purposes for which the earnings of these associations were distributed; and (6) sound financial policies and practices for guiding new or existing cooperative associations not only in Oklahoma, but also in other cotton-ginning areas.

During the summer of 1934, detailed financial reports were obtained by visiting all cooperative cotton-gin associations that operated in Oklahoma during the 1933–34 season. These reports cover the 1933–34 season and were partly complete for 1932–33. Balance sheets as of the beginning and end of the 1933–34 season, as well as a detailed income and expense statement for 1933–34, were obtained from each association. A statement of the expenses for the period 1932–33 was obtained from all but five of the associations.

The financial reports for the 1933–34 season are comparable one with another, even though some variations occur both in the date on which books were closed and the form in which they were kept. The fiscal year for most of these associations ends March 31; for a few, a month or two earlier; and for others, a few months later. As very little cotton is ginned after January 1 of each crop year and the income and expense statement of each association is for a 12-month period, this difference is not of much importance.

The annual statements of most of the associations had been prepared by commercial auditors. The desired information on associations which had no audit available was obtained directly from the gin books and other records in the gin office. In order, therefore, that the classification of accounts might be the same for all associations, it was necessary to make certain adjustments in most of the records. Accounts such as depreciation expenses, accrued expenses, prepaid items, capital stock outstanding, depreciation reserves, and surplus were uniformly classified. Uniform rates of depreciation for fixed assets were used for previous years as well as for the current year. Prepaid and accrued items of expense were separated from expenses of the current year. Any changes made in these accounts were, of course, reflected in corresponding changes in surplus.

Additional information was obtained from the gin manager, or from some officer of the association, on the history of the association, its method of financing, number of members, size of plant, type of power, business organization and practices, dividend policies, and other subjects. This information was intended for use in analyzing the financial data, and also in preparing subsequent publications dealing more specifically with these subjects.

# Importance of Cooperative Cotton Ginning in Oklahoma

## Number and Size of Associations

THERE were 95 local associations operating cotton gins in Oklahoma during the 1933–34 season. Their geographical location is shown in figure 1. Each of these associations was a separate local organization with its own board of directors generally consisting of five members. The total membership of these associations was about 12,600, some 11,000 of whom ginned cotton at cooperative plants during 1933–34. In addition, some 6,000 nonmember patrons also used the ginning and other facilities of these associations.

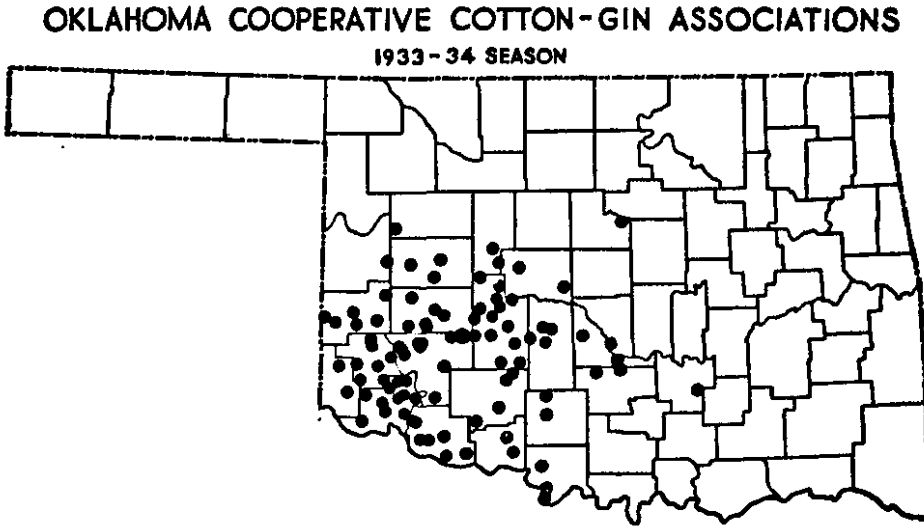


FIGURE 1.—Most of the cooperative cotton gins in Oklahoma are located in the southwestern part of the State.

## Volume of Cotton Ginned

The 95 cooperative gin associations, operating 11.5 percent of the active plants in the State, ginned 260,717 bales, or 21.1 percent of the 1933 Oklahoma crop (table 1). For all counties in which one or more cooperative gins were located the cooperative associations, although operating only 20.6 percent of the active plants, ginned 30.4 percent of the cotton. In Greer County the cooperative associations ginned 55.7 percent of the total cotton, operating only 40 percent of the active gins of the county. In 4 counties more than 40 percent of the cotton was ginned at cooperative plants; and in 12 counties, more than 25 percent. The average volume per plant for the cooperative

gin associations was 2,607 bales as compared to a State average of 1,268 bales for other gins, not including the cooperatives, and an average of 1,547 bales for other gins in counties where there was one or more cooperative gins.

TABLE 1.—NUMBER OF ACTIVE GIN PLANTS AND PERCENTAGE OF COTTON GINNED COOPERATIVELY IN SPECIFIED COUNTIES OF OKLAHOMA 1933–34

| Counties [1] | Number of gin plants | | | Running bales ginned | | | Average volume single plant | |
|---|---|---|---|---|---|---|---|---|
| | Total [2] | Cooperative | Ratio of cooperative to total | Total gins [2] | Cooperative gins | Percentage ginned by cooperatives | Other than cooperative gins | Cooperative gins |
| | *Number* | *Number* | *Percent* | *Bales* | *Bales* | *Percent* | *Bales* | *Bales* |
| Greer | 20 | 8 | 40.0 | 36,731 | 20,475 | 55.7 | 1,355 | 2,559 |
| Jackson | 35 | 12 | 34.3 | 83,466 | 38,935 | 46.6 | 1,936 | 3,245 |
| Kiowa | 34 | 12 | 35.3 | 74,496 | 31,804 | 42.7 | 1,941 | 2,650 |
| Caddo | 48 | 15 | 31.3 | 76,959 | 31,414 | 40.8 | 1,380 | 2,094 |
| Cotton | 10 | 2 | 20.0 | 24,729 | 9,243 | 37.4 | 1,936 | 4,622 |
| Canadian | 8 | 2 | 25.0 | 18,106 | 6,148 | 34.0 | 1,993 | 3,074 |
| Washita | 34 | 7 | 20.6 | 56,328 | 18,175 | 32.2 | 1,413 | 2,596 |
| Comanche | 18 | 4 | 22.2 | 31,043 | 9,442 | 30.4 | 1,543 | 2,361 |
| Beckham | 30 | 7 | 23.3 | 50,765 | 13,809 | 27.2 | 1,607 | 1,973 |
| Custer | 14 | 3 | 21.4 | 21,938 | 5,896 | 26.9 | 1,458 | 1,965 |
| Jefferson | 19 | 3 | 15.8 | 34,927 | 9,026 | 25.8 | 1,619 | 3,009 |
| Tillman | 34 | 7 | 20.6 | 94,148 | 24,267 | 25.8 | 2,588 | 3,467 |
| Grady | 32 | 3 | 9.4 | 50,161 | 11,757 | 23.4 | 1,324 | 3,919 |
| Blaine | 13 | 2 | 15.4 | 21,291 | 4,499 | 21.1 | 1,527 | 2,250 |
| Harmon | 14 | 2 | 14.3 | 27,187 | 5,458 | 20.1 | 1,811 | 2,729 |
| Dewey | 12 | 1 | 8.3 | 14,757 | 2,673 | 18.1 | 1,099 | 2,673 |
| McClain | 18 | 2 | 11.1 | 23,327 | 3,841 | 16.5 | 1,218 | 1,921 |
| Stephens | 15 | 2 | 13.3 | 26,729 | 4,357 | 16.3 | 1,721 | 2,179 |
| Cleveland | 7 | 1 | 14.3 | 10,994 | 1,609 | 14.6 | 1,564 | 1,609 |
| Okfuskee | 20 | 1 | 5.0 | 17,876 | 2,442 | 13.7 | 812 | 2,442 |
| Garvin | 25 | 2 | 8.0 | 37,591 | 3,709 | 9.9 | 1,472 | 1,855 |
| Pontotoc | 11 | 1 | 9.1 | 9,367 | 862 | 9.2 | 851 | 862 |
| Roger Mills | 15 | 1 | 6.7 | 15,132 | 876 | 5.8 | 1,018 | 876 |
| All counties having cooperative gins | 486 | [3] 100 | 20.6 | 858,048 | 260,717 | 30.4 | 1,547 | 2,607 |
| All counties in State | 869 | [3] 100 | 11.5 | 1,235,851 | 260,717 | 21.1 | 1,268 | 2,607 |

[1] Counties are arrayed by percentage of total bales ginned by cooperatives.
[2] U. S. Department of Commerce, Bureau of Census, Cotton Production in the United States, Crop of 1933.
[3] 5 of the 95 cooperative associations had 2 complete plants.

## Total Business Transacted

The combined gross sales of the 95 associations amounted to $8,309,774 in 1933–34, an average of $87,471 per association (table 2). More than half of this amount, or $5,453,679, represented sales of 115,796 bales of cotton purchased from patrons. Total revenue from ginning tolls alone amounted to $1,004,418, or an average of $10,573 per association. The sale of 83,425 tons of cottonseed amounted to $1,171,949 for all associations combined, or an average of $12,336 per association. The sale of bagging and ties was $260,295 for all associations. Gross sales of side lines, such as feed, coal, and supplies, was $410,231; and miscellaneous income $9,202 for all 95 associations.

TABLE 2.—CONSOLIDATED INCOME AND EXPENSE STATEMENT OF 95 COOPERATIVE COTTON-GIN ASSOCIATIONS IN OKLAHOMA, 1933–34

| Item | All associations | | Average per association | |
|---|---|---|---|---|
| | *Quantity* | *Amount* | *Quantity* | *Amount* |
| Cotton: | | | | |
| Sales (bales) | 115,796 | $5,453,679 | 1,219 | $57,407 |
| Total cost of cotton sold | | 5,409,527 | | 56,942 |
| Income from cotton | | 44,152 | | 465 |
| Cottonseed: | | | | |
| Sales (tons) | 83,425 | 1,171,949 | 878 | 12,336 |
| Total cost of cottonseed sold | | 974,376 | | 10,257 |
| Income from cottonseed | | 197,573 | | 2,079 |
| Coal, feed, supplies: | | | | |
| Sales | | 410,231 | | 4,318 |
| Total cost of sales | | 409,972 | | 4,315 |
| Income from coal, feed, supplies | | 259 | | 3 |
| Bagging and ties: | | | | |
| Sales (patterns) | 260,940 | 260,295 | 2,747 | 2,740 |
| Cost of bagging and ties | | 177,422 | | 1,868 |
| Income from bagging and ties | | 82,873 | | 872 |
| Ginning: | | | | |
| Revenue: | | | | |
| Bales | 260,717 | | 2,744 | |
| 100 pounds seed cotton | 4,650,515 | 1,004,418 | 48,953 | 10,573 |
| Expenses | | 919,690 | | 9,681 |
| Income from ginning | | 84,728 | | 892 |
| Miscellaneous income | | 9,202 | | 97 |
| Total net income | | 418,787 | | 4,408 |
| Total gross sales | | 8,309,774 | | 87,471 |

## Assets, Liabilities, and Net Worth

The combined total assets of the 95 associations, after allowing for depreciation on buildings, gin machinery, and equipment, amounted to more than $2,720,000 as of the end of the 1933–34 season (table 3). This was an average of $28,640 per association. Fixed assets comprised chiefly of gin machinery, buildings, and land, made up nearly 75 percent of the total assets. A small portion of the fixed assets, classified in table 3 as "other fixed assets", consisted principally of filling stations, grain elevators, and store buildings owned by a few of the associations.

This relatively large investment in fixed assets sometimes makes it difficult for members to raise the initial capital required for a newly organized cooperative cotton-ginning association. However, it generally assures more continuous patronage of the cooperative year after year by members seeking to protect their large investment.

As a rule the amount of cash on hand and the inventories are the only real current assets of a cooperative ginning association. These two items made up only 12.3 percent of the total assets. Notes and

accounts receivable on hand at the close of the ginning season frequently indicate "frozen" rather than current assets; and as a rule, represent the amount of ginning charges or sales for the previous year or years which are still uncollected and must be carried over to the next season. A large percentage of the total at the end of each year later proves to be uncollectible. This indicates the desirability of either charging off accounts known to be uncollectible or setting up sufficient reserves to cover those that are of doubtful value. As shown by this study, however, accounts and notes receivable made up only 5.8 percent of the total assets.

TABLE 3.—CONSOLIDATED BALANCE SHEET OF 95 COOPERATIVE COTTON GIN ASSOCIATIONS IN OKLAHOMA AT THE CLOSE OF THE 1933–34 SEASON

| Item | All associations | Average per association | Percentage of total |
|---|---|---|---|
| *Assets* | | | |
| Current assets: | | | |
| Cash on hand and in banks | $259,524 | $2,732 | 9.5 |
| Inventories | 75,001 | 790 | 2.8 |
| Accounts and notes receivable | 157,473 | 1,658 | 5.8 |
| Total current assets | 492,088 | 5,180 | 18.1 |
| Other assets: | | | |
| Stock subscription notes | 175,520 | 1,847 | 6.5 |
| Investments, deposits, etc. | 32,862 | 346 | 1.2 |
| Total other assets | 208,382 | 2,193 | 7.7 |
| Fixed assets: | | | |
| Land | 115,311 | 1,214 | 4.2 |
| Buildings [1] | 532,030 | 5,600 | 19.5 |
| Gin machinery and equipment [1] | 1,300,529 | 13,690 | 47.8 |
| Office furniture and fixtures [1] | 10,152 | 107 | .4 |
| Autos and trucks [1] | 1,864 | 20 | .1 |
| Other fixed assets [1] | 57,726 | 608 | 2.1 |
| Total fixed assets | 2,017,612 | 21,239 | 74.1 |
| Prepaid expenses | 2,678 | 28 | .1 |
| Total assets | 2,720,760 | 28,640 | 100.0 |
| *Liabilities and net worth* | | | |
| Current liabilities: | | | |
| Accounts payable | 31,327 | 330 | 1.2 |
| Accrued expenses | 90,238 | 950 | 3.3 |
| Dividends payable and members' credits | 195,233 | 2,055 | 7.2 |
| Total current liabilities | 316,798 | 3,335 | 11.7 |
| Fixed liabilities: | | | |
| Notes payable | 89,906 | 947 | 3.3 |
| Mortgages payable | 562,815 | 5,924 | 20.7 |
| Total fixed liabilities | 652,721 | 6,871 | 24.0 |
| Total liabilities | 969,519 | 10,206 | 35.7 |
| Net worth: | | | |
| Capital stock | 1,550,045 | 16,316 | 57.0 |
| Surplus | 201,196 | 2,118 | 7.3 |
| Total net worth | 1,751,241 | 18,434 | 64.3 |
| Total liabilities and net worth | 2,720,760 | 28,640 | 100.0 |

[1] Original cost less depreciation.

Stock subscription notes representing unpaid balances on subscribed capital stock amounted to 6.5 percent of the total assets. These notes were, of course, secured by the shares of stock for which they were given in purchase. Collection on these stock subscription notes is, for the most part, made by off setting dividend payments as credits. Investments and other miscellaneous assets, including utility deposits and similar items, were only 1.2 percent of the total assets.

The total liabilities were 35.7 percent of the total assets. Notes and mortgages payable owed to gin-machinery and other machinery companies, individuals, local banks, and the bank for cooperatives were 24 percent of the total assets, and made up more than two-thirds of the total liabilities. Such total amounts or installments of these notes and mortgages that were already past due or would become due within 12 months would have been more properly shown as current rather than fixed liabilities.

Accounts payable at an average of $330 per association were relatively small. Accrued expenses, made up principally of interest, were rather large in relation to the financial size of these organizations, averaging $950 per association.

The liability account, "dividends payable and members' credits", which averaged $2,055 per association, probably did not represent an actual liability for many of these associations. This grouping was resorted to in combining the balance sheets, as it was impossible to determine from individual balance sheets whether the intention was to pay these liabilities in cash or by issuing additional stock. In some instances, this account included "certificates of indebtedness" that had been issued in lieu of dividends. Dividends formally declared by the board of directors are an obligation of the association for which it might be sued to force payment in much the same way as it might be sued on a note or account payable. "Certificates of indebtedness", likewise, were in most cases intended to be valid obligations of the association.

Credits on stock, on the other hand, in no case represented a declared liability of the association, but rather, a mutual understanding that a share of stock would be issued upon the accumulation of dividends sufficient to equal the par value of one share. Credits on stock, which in practically every case were issued to members only, represented patronage dividends that had been declared and were to be paid in additional shares of capital stock. They were, therefore, in the nature of part payments on additional stock, to be converted into stock formally issued when sufficient amounts were accumulated to equal one share at par value. They were really a form of surplus that was in the process of being converted into capital stock. Consequently, had it been possible to accurately separate these credits

from dividends payable, and from certificates of indebtedness, they could have been shown more correctly as a part of the net worth than as a liability. As a result, the liabilities of these associations, as shown by the combined balance sheet, would have been less and the net worth correspondingly more, which would have given the members a slightly higher equity than shown. This emphasizes the desirability of clearly showing in a balance sheet the correct designation of such accounts.

Net worth was 64.3 percent of the total assets. This 64.3 percent was the equity of the members in the $2,720,760 of total assets. Of this total amount 57.0 percent was represented by capital stock and 7.3 percent by undivided surplus. The members of these associations had invested a total of $1,751,241, or an average of $18,434 per association, either by purchases of stock or by the reinvestment of earnings in financing the associations.

Members or stockholders acquire equity in two principal ways: (1) Original investment in capital stock, and (2) net earnings that are left in the association by members. Undivided earnings are shown in the balance sheet as surplus. The sum of surplus and capital stock represents the total amount which the stockholders or members have invested in the cooperative association. These two accounts comprise the net worth of the association, or the total amount of money which would remain if all assets were sold at book value and all indebtedness paid.

### *Equity of Members in Assets of Their Associations*

Equity of members in the assets of their associations, as used herein, is the percentage of total book value of the assets which is free of all indebtedness; that is, equity is net worth expressed as a percentage of total assets. As mentioned above, the stockholder-members of the 95 Oklahoma cooperative gin associations had an equity of 64.3 percent in the total assets of these associations. In other words, the stockholder-members owned, clear of indebtedness, an average of $64.30 for every $100 of book value of assets.

TABLE 4.—AVERAGE EQUITY OF MEMBERS IN 95 OKLAHOMA COOPERATIVE COTTON GIN ASSOCIATIONS, AT THE CLOSE OF THE 1933–34 SEASON, BY YEAR OF ORGANIZATION

| Year organized | Associations | Average equity of members | Year organized | Associations | Average equity of members |
|---|---|---|---|---|---|
| | *Number* | *Percent* | | *Number* | *Percent* |
| 1919 to 1920 | 5 | 73.1 | 1929 | 21 | 58.2 |
| 1921 to 1925 | 5 | 83.6 | 1930 to 1932 | 8 | 55.7 |
| 1926 | 7 | 84.9 | | | |
| 1927 | 29 | 72.0 | Total or average | 95 | 64.3 |
| 1928 | 20 | 44.0 | | | |

There was, however, considerable variation between different associations. For 39 associations the equity of members was over 80 percent. About half of these 39 associations were practically free of all indebtedness, the members having 98 to 100 percent equity. The members of 11 associations had less than a 20-percent equity in the assets of their association. A classification of associations according to the percentage of equity of members at the end of the 1933–34 season, follows:

Number of associations according to percentage of equity:

| | |
|---|---|
| Less than 0.1 | 4 |
| 0.1 to 20.0 | 7 |
| 20.1 to 40.0 | 11 |
| 40.1 to 60.0 | 18 |
| 60.1 to 80.0 | 16 |
| 80.1 to 100.0 | 39 |

On an average, the equity of the members tended to be less for the associations organized in more recent years (table 4). There are probably two reasons for this. The younger associations operating at the time of this study included some on the verge of bankruptcy, while similar associations among those organized during earlier years had already failed and their records were, of course, not included in this table. Moreover, the older associations had used a certain amount of their net earnings year after year to pay off the indebtedness incurred at the time their gin plants were purchased.

MEMBERS' EQUITY IN OKLAHOMA COOPERATIVE COTTON-GIN ASSOCIATIONS, 1933–34

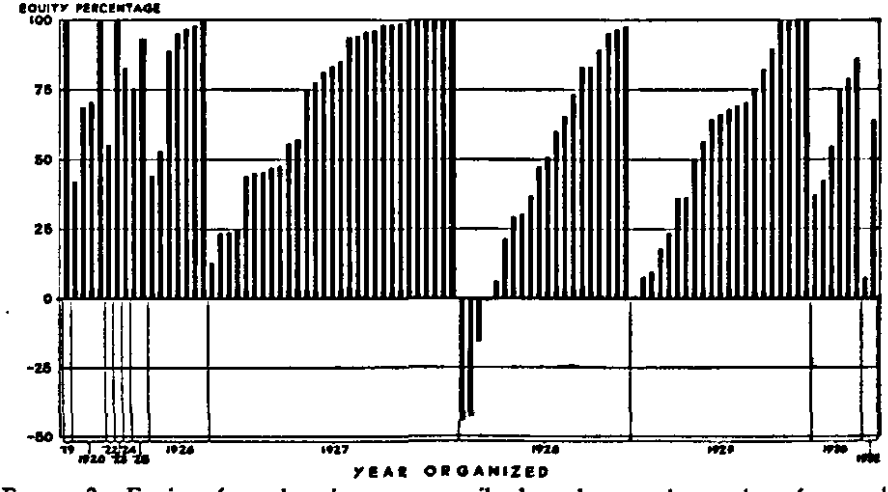


FIGURE 2.—Equity of members is not necessarily dependent on the number of years the association has operated.

The average equity of the members by year of organization as shown in table 4 is perhaps misleading, in that some individual associations organized in more recent years show a high equity for their members; whereas others organized in earlier years show a low equity. There was a tendency, however, for the older associations to show the greater equity. The equity of each individual association by the year organized is shown in figure 2.

### *Average Investment of Associations*

More than half of the cooperative cotton-gin associations had between $20,000 and $30,000 of total assets; 12 had less than $20,000; and 8 more than $40,000. The following is a classification of all associations at the close of the 1933–34 season, according to their total assets.

| Total assets: | *Number of associations* |
|---|---|
| Less than $20,000 | 12 |
| $20,000 to $24,999 | 31 |
| $25,000 to $29,999 | 23 |
| $30,000 to $34,999 | 13 |
| $35,000 to $39,999 | 8 |
| $40,000 or more | 8 |
| Total | 95 |

The variations in the amounts of total assets are due to several factors, the more important of which are: (1) Size, age, and condition of the gin plant; (2) type of power; (3) type of gin buildings; (4) value of other fixed assets owned in addition to the gin plant; such as, grain elevators, filling stations, stores, land, and similar property; (5) the amount of current assets on hand; such as, cash, accounts and notes receivable, inventories, investments, and similar items. Practically all of the difference in the original cost of new gin plants is due to number of stands, amount of other equipment, type of power, and material used in the buildings.

The average original cost of the gin machinery and the power unit, not including land and buildings, for plants purchased new in Oklahoma during the 3-year period 1927–1929, by size of gin machinery and type of power is shown in table 5. Since the cost of gin machinery has declined during the last few years the figures do not represent present replacement costs. They do, however, give some indication of the relative costs of plants of different size. The 4–80 plant of each power type had an average original cost of $2,600 to $3,000 less than the 5–80 plants.[4] Oil plants of either size showed a higher average original cost than steam plants; while steam plants, in turn, had a higher average cost than electric plants.

[4] See footnote 1, table 5.

TABLE 5.—AVERAGE COST OF NEW GIN MACHINERY AND POWER EQUIPMENT PURCHASED BY 48 OKLAHOMA COOPERATIVE COTTON GIN ASSOCIATIONS DURING THE PERIOD 1927–1929, BY SIZE OF PLANT AND TYPE OF POWER

| Type of power | 4-80 plants [1] | | 5-80 plants [1] | |
|---|---|---|---|---|
| | Number of associations | Average cost | Number of associations | Average cost |
| Electric | 3 | $20,900 | 20 | $28,500 |
| Steam | 2 | 23,200 | 9 | 26,100 |
| Oil | 3 | 24,900 | 11 | 27,900 |

[1] Size of plant is designated by the number of gin stands and the number of saws per stand. Thus a 4-80 plant is one that has 4 gin-stands of 80 saws each. A 5-80, likewise, has 5 gin stands of 80 saws each.

The relative costs of all-steel buildings as compared with wood-frame, steel-covered buildings, for 5–80 plants constructed during the 3-year period 1927–1929, by type of power used, is shown in table 6. These figures are not necessarily replacement costs. Comparable costs of buildings of all-wood construction are not available as none were built during this period. Most of the gin buildings in Oklahoma are wood-frame covered with corrugated steel on the sides and roof. A few of the older plants have all-wood buildings; and some of the most recently constructed buildings have a steel frame covered entirely with corrugated steel.

TABLE 6.—AVERAGE COST OF SELECTED TYPES OF GIN BUILDINGS [1] FOR 5–80 PLANTS USING SPECIFIED TYPES OF POWER, CONSTRUCTED BY 37 OKLAHOMA COOPERATIVE ASSOCIATIONS DURING THE PERIOD 1927–1929

| Type of building | Plants using electric power | | Plants using steam power | | Plants using oil power | |
|---|---|---|---|---|---|---|
| | Number of associations | Average cost of buildings | Number of associations | Average cost of buildings | Number of associations | Average cost of buildings |
| Wood-frame steel-covered | 16 | $7,122 | 8 | $7,795 | 8 | $7,443 |
| All steel | 1 | 10,603 | 2 | 11,187 | 2 | 11,029 |

[1] Includes cost of foundation.

During this period the costs of all-steel buildings averaged about $3,500 more than the wood-frame steel-covered buildings. Within its own constructional group, buildings of either type had a higher average cost for plants using steam power than for those using oil power; and for plants using electric power, a smaller investment was made than for either of the other two power types. The difference in the cost of the building as influenced by the type of power is, of course, due to differences in the size of the buildings and foundations required for the installation of the different types of power units. The demand for all-

steel buildings, although requiring a greater initial investment than wood-frame steel-covered buildings, is increasing because of the longer period of their usefulness at smaller costs for upkeep and depreciation, and because of the lower fire insurance rates obtainable on this type of building.

# Expenses[5]

## Classification of Ginning Expenses

THE expense statements obtained from the cooperative gin associations were uniformly audited. An attempt was made to include in the 1933–34 operations all items of expense incurred during that season, irrespective of whether or not paid; and to exclude all expense items of previous years that were paid and reported as expenses during 1933–34.

The items classed as ginning expenses in this study are those ordinarily shown as such in the annual income and expense statements of most cooperative cotton-gin associations. For purposes of analysis, these expenses were divided into three main groups. The first two groups are directly connected with the operation of the gin machinery, the third group with the management and the maintenance of the office. All of the overhead expenses, such as manager's salary, office salaries, office supplies, and similar items, are considered as part of the necessary expenses of ginning proper. The following classification, which is common to most cooperative gins, was used:

1. Operating expenses:
   - Labor.
   - Fuel and lubricating oil.
   - Repairs and gin supplies.
   - Miscellaneous.
2. Fixed expenses:
   - Insurance.
   - Taxes, except Federal income.
   - Depreciation.
3. Administrative expenses:
   - Manager's salary and expense.
   - Directors' fees and expense.
   - Office salaries.
   - Auditing and legal fees.
   - Telephone and telegraph service.
   - Office supplies.
   - Advertising.

[5] The term "expenses" rather than costs has been used in this analysis, as interest on investment has not been considered.

There was some variation in the terminology of expense accounts of the associations; and it is recognized that some discrepancies still exist, although the records of each association have been carefully audited. An attempt was made, however, to classify uniformly the expense items in the records of all 95 associations in the following manner:

### *Operating Expenses*

*Labor.*—All operating wages paid to the gin crew, including the night watchman and yardmen, when employed, were shown under this account. Labor employed in repair work during the idle season was not included here but in the expense item "Repairs." The salaries of the manager and office help were not included.

*Fuel and lubricating oil.*—All expenditures for electric current or fuel such as coal, natural gas, fuel oil, and distillate, together with freight, drayage, and unloading costs on these items were charged to this account; and likewise all expenditures for oil and grease used in lubricating either the gin machinery or the power unit. Most of the associations reported expenses for fuel and lubrication as one total. Since it was not possible to separate accurately charges reported for fuel and lubricating oil, these two items were grouped into one account. The expenses for fuel and lubrication alone should not be confused with total power costs as the engineer's labor and depreciation on the power unit were not included here.

*Repairs and gin supplies.*—In the records of many of the associations, all expenses for repairs and supplies were kept in one account. It seemed expedient, therefore, to combine these two items of expense. All labor as well as material used in repairing the gin machinery, power unit, or buildings were included here, and also freight and express on these repair parts. Supplies included such items as tools, brooms, seed forks, belt lacing and dressing, waste, and other similar items used in the operation of a cotton gin.

*Miscellaneous.*—Any expense of operation that could not be included under the more definite classifications generally fell into this catch-all group. It was intended, however, to include only items of an unusual nature connected with the operations of the gin plant, as distinct from miscellaneous expense items incurred in handling cotton, cottonseed, coal, feed, or other commodities. Drayage charges for ginning proper such as hauling dirt or burrs, special services performed for ginning customers, and similar items made up a large part of this expense account.

### *Fixed Expenses*

*Insurance.*—This account included insurance premiums of all kinds in connection with operation of the gin. Fire and tornado insurance on the buildings and machinery, together with compensation or pay-

roll insurance, made up the greater portion of the expense under this account. A smaller part consisted of premiums on blanket fire-insurance policies protecting the association from loss on its purchased cotton and cottonseed, and customers' products while on the gin property. Premiums on surety bonds for the gin manager, bookkeeper, and officers were a relatively small part. Most of the associations also carried some public liability insurance.

*Taxes.*—Included in this account were State property, income, and sales taxes; State corporation licenses; Federal check, capital stock, and all other Federal taxes except income and excess-profits taxes. Federal income taxes were considered as a deduction from income.

*Depreciation.*—This account included the estimated depreciation on all depreciable assets. Since there was considerable variation in the methods and rates which different associations used in deriving the cost of depreciation, this account was recalculated for practically all of the associations. The amount of depreciation charged as a ginning expense during 1933–34, as well as the reserve accounts for depreciation, were recalculated from the original cost of the buildings, machinery, and equipment. The annual rate of depreciation, based on the estimated useful life of different types of assets, used in calculating the depreciation expense for the 1933–34 season is shown in table 7.

TABLE 7.—ESTIMATED USEFUL LIFE AND ANNUAL RATE OF DEPRECIATION FOR SPECIFIED FIXED ASSETS OF COTTON GINS [1]

| Assets | Estimated length of useful life | Annual rate of depreciation |
|---|---|---|
| | *Years* | *Percent* |
| Gin machinery and power unit | 15 | 6¾ |
| Buildings: | | |
| All-steel | 30 | 3½ |
| Wood-frame steel-covered | 25 | 4 |
| All-wood | 20 | 5 |
| Office furniture and fixtures | 10 | 10 |
| Autos and trucks | 4 | 25 |

[1] Compiled from: U. S. Treasury, Bureau of Internal Revenue, DEPRECIATION STUDIES, Prelim. Rept., January 1931.

## *Administrative Expenses*

*Manager's salary and expense.*—Compensation paid to managers for all kinds of services, such as salaries, commissions, house rents, and traveling expenses, were included in this account. No attempt was made to prorate any of the managers' salary or other overhead expenses to cotton, cottonseed, and side lines.

*Directors' fees or expenses.*—This account included all amounts paid to directors for performance of their official duties. Some associations paid a small fee for each meeting attended; others, the expenses incurred while transacting business of the association.

*Office salaries.*—Salaries of the bookkeepers, weighers, and other clerical help were shown in this account.

*Auditing and legal fees.*—For most of the associations these items of expense represented an annual or monthly fee paid to outside auditors for preparing annual reports and making out necessary State and Federal reports. A few associations reported paying small legal fees.

*Telephone and telegraph service.*—This account included the usual monthly telephone charges and, in addition, long-distance calls made and telegrams sent in connection with the operation of the gin. Where it was evident that numerous long-distance calls were made in selling cotton or cottonseed, part of the expense reported under this heading was charged to the cost of the commodities rather than to ginning expenses.

*Office supplies.*—Blank forms and records used by the association, and such office supplies as pencils, paper, and ink were included under office supplies.

*Advertising.*—The cost of supplies used for advertising, such as pencils, calendars, record books, and similar items which gins usually give to patrons each season were charged to this account; also small donations to local charity and frequently the cost of flowers for local funerals.

## Expenses Other Than Ginning

Other items of expense which were not considered essential to the actual operation of the gin plant were chargeable, not to ginning expenses, but directly to the cost of the commodities purchased. To the extent that any item of expense was increased as a direct result of buying and selling cottonseed, cotton, or other side-line activities, the amount of the increase was charged against the cost of the commodity handled. However, no attempt was made to prorate any portion of the general administrative expenses to activities other than ginning.

Direct costs, such as drayage and insurance in connection with the handling of bale cotton, cottonseed, and other side lines were considered as a part of the cost of sales of the commodities. It is doubtful, however, if the handling of cotton and cottonseed and small amounts of side lines during the ginning season materially increases overhead expenses. Moreover, the buying of cottonseed, especially, is so essential to the operation of a cotton gin that it would be practically impossible to obtain any ginning business without buying cottonseed.

Several other items of expense to the associations could not always be classed as ginning expenses. It was necessary, therefore, to exclude the following items from ginning expenses, and to give them fuller consideration later under distribution of income:

*Federal income and excess profits taxes.*—A cooperative gin may be exempted from the payment of these taxes by complying with certain

regulations of the Bureau of Internal Revenue;[6] hence, these taxes are not included under the ginning expenses. For this reason these taxes, where paid, are considered a deduction from total net income.

*Interest on notes and mortgages.*—Interest paid on borrowed money was likewise not considered as an expense of ginning, but rather as a distribution or an income deduction. The expense of operating a cotton gin cannot be said to be increased if a part of the capital requirements are borrowed. Interest has to be paid, of course, on any money borrowed; but it is a cost to the association or a fixed claim on a portion of the income, rather than an expense of operating the gin.

*Losses on bad accounts.*—Accounts charged off were likewise considered as a deduction from income rather than an expense. The charges for ginning service were generally payable in cash; and charges for ginning and wrapping were usually deducted from the purchase price of the cottonseed ginned from each bale. In Oklahoma, a charge for ginning and wrapping is a prior lien on the bale of cotton ginned and is, therefore, collectible if the gin association desires to enforce this lien. Losses charged off as bad accounts during any one year often represent accounts incurred in prior years and, for the most part, occasioned by the sale of other products rather than by ginning services. Losses on bad accounts, therefore, are not considered as expenses of operating a cotton gin.

*Dues.*—Annual dues of members paid by the local gin associations to general farm organizations, as well as dues of local associations paid to civic organizations, were considered as a disposition of earnings rather than an expense of operating the gin.

## Principal Expenditures

The total combined expense of all associations amounted to nearly a million dollars for the 1933–34 season, or an average of $9,681 per association (table 8). The average expense amounted to $3.53 per running bale, and 19.8 cents per 100 pounds of seed cotton.

Labor and depreciation were the two most important items of expense, each of these accounting for about 21 cents of each dollar of the total expense. Each of the three accounts—fuel and lubrication, repairs and supplies, and manager's salary and expenses—amounted to more than 10 cents per dollar of total expense. Insurance accounted for nearly 9 cents of each dollar. That is, these 6 items of expense make up a little more than 86 percent of the total expense of ginning cotton at these 95 establishments. Almost half of the total expenses were direct payments for personal services, labor, salaries, commis-

[6] U. S. Treasury, Bureau of Internal Revenue. EXEMPTION OF FARMERS' AND OTHER COOPERATIVE MARKETING AND PURCHASING ASSOCIATIONS. [R. A. 592, IT:E:R.R. Mimeographed.]

sions, and fees. Local and State taxes took almost 5 cents of each dollar of expense and averaged $473 per association, or a combined total of almost $45,000 for the 95 associations.

TABLE 8.—GINNING EXPENSES OF THE 95 COOPERATIVE COTTON GIN ASSOCIATIONS IN OKLAHOMA, 1933–34

| Expense items | Total ginning expenses | Average expenses per— | | | Percentage of total expense |
|---|---|---|---|---|---|
| | | Association | Running bale | 100 pounds of seed cotton | |
| | *Dollars* | *Dollars* | *Dollars* | *Cents* | *Percent* |
| Labor | 196,513 | 2,090 | 0.76 | 4.3 | 21.5 |
| Fuel and lubricating oil | 117,884 | 1,241 | .45 | 2.5 | 12.8 |
| Repairs and supplies | 108,979 | 1,147 | .42 | 2.3 | 11.8 |
| Miscellaneous [1] | 8,904 | 94 | .03 | .2 | 1.0 |
| Insurance | 79,713 | 839 | .31 | 1.7 | 8.7 |
| Taxes [2] | 44,969 | 473 | .17 | 1.0 | 4.9 |
| Depreciation | 189,335 | 1,993 | .73 | 4.1 | 20.6 |
| Manager's salary and expenses | 102,396 | 1,077 | .40 | 2.2 | 11.1 |
| Directors' fees and expenses | 7,058 | 74 | .03 | .2 | .8 |
| Office salaries | 32,550 | 343 | .12 | .7 | 3.5 |
| Auditing and legal fees | 9,702 | 102 | .04 | .2 | 1.1 |
| Telephone and telegraph service | 6,329 | 67 | .02 | .1 | .7 |
| Office supplies | 8,079 | 85 | .03 | .2 | .9 |
| Advertising | 5,309 | 56 | .02 | .1 | .6 |
| Total | 919,690 | 9,681 | 3.53 | 19.6 | 100.0 |

[1] Items directly connected with the operation of the gin.
[2] Not including Federal income and excess-profit taxes.

Insurance premiums for fire, tornado, and workmens' compensation for all 95 associations were almost $80,000, or an average of $839 per association. The average expense for insurance was 31 cents per bale and 1.7 cents per 100 pounds of seed cotton ginned. The combined expenses for insurance, taxes, and depreciation averaged slightly more than $3,300 per association. Exclusive of compensation insurance, commodity insurance, and bond premiums, the average association had annual fixed expenses of approximately $3,000 even though it did not operate.

## Methods of Analysis of Ginning Expenses

In this analysis the relationship between ginning expenses per 100 pounds of seed cotton and volume in running bales is the basis of comparing expenses between plants of different size, between plants having different types of power, and between plants grouped according to other factors that affect expenses.

The nature of the relationship for each group having a common characteristic is disclosed by a scatter diagram, on which the data for expenses and for volume ginned are simultaneously plotted. The diagram thus shows for each gin at its volume in bales the outlay required for ginning 100 pounds of seed cotton, and also shows the range in expenses and volume respectively for the plants represented in the group. In addition, an important feature is the line or curve

of average relationship, around which the plotted points or dots are distributed. The line smooths out the data and provides a means for interpreting somewhat more specifically the extent of the variation of expenses with volume.[7]

Quantitative differences in this variation for two or more groups of plants that are unlike with respect to a designated characteristic, such as size and type of power, are brought out by comparing the lines of average relationship at a given range of volume. Tables showing the readings for expenses at intervals of 500 bales in volume are presented in order that numerical as well as graphical comparisons can be made. The expenses stated in such tables are nothing more than the indicated averages, or the averages shown graphically by the lines of average relationship at 500-bale volume intervals. Obviously, specific points of volume in bales other than those used could have been chosen.

Ginning expenses per unit are more commonly stated in terms of dollars per running bale than in cents per 100 pounds of seed cotton as used in this analysis. Although dollars-per-bale is more easily understood, it has some limitations as a unit for expressing expenses. Ginning charges in Oklahoma are uniformly made on 100 pounds of seed cotton rather than at a flat rate per bale. This is done to allow for the variation in the amount of seed cotton from one bale to another. For the same reason, a comparison between the ginning expenses of two plants is more significant when expressed in cents per 100 pounds of seed cotton than in dollars per bale.

The variation in the quantity of seed cotton per bale depends upon the method used in harvesting, the variety of cotton, the weight of the ginned bales, and numerous other factors. To gin out a bale of any given number of pounds of lint requires a greater number of pounds of snapped cotton than of picked cotton, and more pounds of seed cotton of some varieties than of others, even though both varieties are harvested similarly. Two plants may gin the same number of running

[7] The curves shown in this report were fitted by the method of least squares, the general equation $y = a + b\frac{1}{x}$ being used throughout. The symbol "y" represents expenses in cents per 100 pounds of seed cotton and "x" volume in running bales, and "a" and "b" the constants determined for the individual cases. Preliminary tests indicated that equations of this semireciprocal form were, in general, the most satisfactory for representing the average relationships indicated by the basic data. This method of analysis was used for a similar analysis of expenses of purchasing associations by: Harper, F. A. COOPERATIVE PURCHASING AND MARKETING ORGANIZATIONS IN NEW YORK STATE. N. Y. (Cornell) Agr. Expt. Sta. Bull. 554, 117 pp. illus. 1932. See p. 77.

Technically each scatter diagram illustrates a case of net correlation. That is to say, the relationship between the expenses of ginning 100 pounds of seed cotton and volume ginned in bales is shown, with allowance being made for the effect of a third factor (size, type of power, etc.) on expenses. In drawing comparisons between the curves of average relationship for any two groups of plants it would have been more desirable if the same number of plants had been represented in each group. The difficulty was unavoidable. The equations for the individual curves or lines of average relationship, and the respective indices of correlation and standard errors of estimate are omitted. It should be pointed out, however, that the reliability of the line in each case is indicated by the number of plants represented and by the scatter of the plotted points or dots about the line.

bales from the same variety of cotton harvested in the same manner, and yet handle different quantities of seed cotton because one plant turns out small bales and the other, large. Much of the effect of these factors that contribute to the variation in the quantity of seed cotton per running bale is avoided by expressing ginning expenses in cents per 100 pounds of seed cotton.

Having allowed for the variation between different gins in the average amount of seed cotton per bale, by using cents per 100 pounds of seed cotton as the unit of expense, running bales, which is the most common measure of the volume of a gin plant, could then be used as the unit of volume. It is preferable to equivalent 500-pound bales or pounds of seed cotton in that it is more readily comprehended. Moreover, the number of bales ginned in a given area is not materially affected by the method used in harvesting cotton. The number of pounds of seed cotton ginned, however, is considerably increased if cotton is harvested by snapping rather than picking.

To the extent that the average weight of running bales of different associations varied, equivalent 500-pound bales would have been slightly more accurate as a measure of volume ginned. Although data were not available on the average weight of running bales ginned by each association, it is believed that the averages for the season would be approximately the same.

In all comparisons except those between plants of different size, running bales ginned per 5–80 equivalent plant (per 400 saws) were used instead of the actual volume ginned. As will be shown later, ginning expenses at the same volume of cotton vary directly with the size of the plants as long as the plants are operating below maximum capacity. It was necessary, therefore, in order to use the data for each of the 95 associations in making comparisons, to adjust the data for differences due to the size of plants. This adjustment was made by expressing the actual volume of each plant larger or smaller than 5–80 in the number of bales ginned per 400 saws. The volume of 4–80 and 5–70 plants was increased by the ratio of the number of saws in each to 400. The volume of 6–70 or larger plants was similarly reduced. For example, the volume of a 4–80 plant ginning 2,000 bales was adjusted to 2,500 bales. Similarly, the volume of a 10–80 plant ginning 5,000 bales was adjusted to 2,500 bales. Since 67 of the 95 associations had 5–80 plants, it was necessary to adjust the volume of only 28 plants. Of the 28, the volume of 21 was increased, and the volume of 7 reduced.

As will be shown later, increasing the volume of plants smaller than 5–80, and reducing the volume of plants larger than 5–80, to the volume ginned per 400 saws does not change the relationship between ginning expenses and volume when the data for all 95 plants are in-

cluded in the same problem. Moreover, not only is the total number of gins available increased to a number sufficient for satisfactory comparison, but the distribution within power groups, volume groups, and other groupings used is made more nearly equal by using the data for all 95 of the associations rather than for the 5–80 plants only.

## Factors Influencing Expenses

As is generally known among those associated with the ginning industry, volume produces greater differences in the per unit expense of ginning cotton than any other factor. For this reason an analysis of the effect of other factors on expenses must be made at the same volume or for groups of gins according to the range of volume represented.

In addition to volume, the following factors were analyzed to determine their effect on ginning expenses: (1) Size of the gin plant as measured by the number of saws, (2) type of power used, (3) proportion of picked and snapped cotton ginned, (4) percentage of ginned cotton purchased, (5) experience and training of the gin manager, (6) number of days the plant operated during the season, and (7) percentage of total volume ginned during the most active calendar months. It is probable that many other factors, some of which are not measurable from the data available, contribute to differences in expenses of ginning plants.

All 95 associations are classified in table 9 by the size and power type of their gin plants. Most of these associations owned only one gin plant; four associations had two separate and complete plants each, and one had a double battery plant. Sixty-seven of the associations, or more than two-thirds, had 5–80 plants; 15 had 4–80 plants.

TABLE 9.—OKLAHOMA COOPERATIVE COTTON GIN ASSOCIATIONS CLASSIFIED BY SIZE OF PLANT AND TYPE OF POWER, 1933–34

| Size of gin plant [1] | Number of plants using indicated type of power | | | | Total |
|---|---|---|---|---|---|
| | Steam | Electric | Oil [2] | Steam and oil [3] | |
| 4–80 | 5 | 5 | 5 | ---------- | 15 |
| 5–70 | 2 | 2 | 2 | ---------- | 6 |
| 5–80 | 20 | 28 | 19 | ---------- | 67 |
| 6–70 | 1 | ---------- | 1 | ---------- | 2 |
| 9–80 [4] | 1 | ---------- | ---------- | ---------- | 1 |
| 10–80 [5] | ---------- | 1 | ---------- | 1 | 2 |
| 11–80 [5] | ---------- | ---------- | ---------- | 1 | 1 |
| 12–80 [4] | ---------- | ---------- | 1 | ---------- | 1 |
| All sizes | 29 | 36 | 28 | 2 | 95 |

[1] Number of stands and number of saws per stand. For example, a 4–80 plant has 4 gin stands of 80 saws each.
[2] Includes 2 plants using natural-gas engines.
[3] 2 complete plants, 1 with steam power and 1 with oil power.
[4] Double battery plant; one 5–80 and one 4–80 plant under the same roof.
[5] 2 complete plants; each plant is in a separate building.

The total number of plants owned by all associations was the equivalent of 100 single plants.

Three main types of power were represented. Thirty-six associations, or more than one-third, used electric power; 29 used steam power; 28 used oil power; and 2 associations, having 2 complete plants each, operated 1 plant with steam and 1 with oil power.

### *Size of Plant and Volume Ginned*

*Relation to total expenses.*—Ginning expenses are definitely influenced by the size of the plant. If the volume ginned is less than the normal capacity of the smaller plant (table 10 and fig. 3), the smaller the plant the lower the average expense of ginning any given volume. Differences in total expenses of plants of different size are less as comparisons are made at greater volumes. This suggests that if data had been available for comparison at sufficiently larger volumes, the average expenses of the plants in each larger-size group would have been less than those of plants in the next smaller-size group.

Within the limits of these data the average ginning expenses of 4–80 plants were lower than those of 5–80 plants. The differences became less pronounced at higher volumes. The exact volume at which the average expenses of 4–80 plants would be as high as that of 5–80 plants would depend on several factors. For example, if the total volume ginned during a given season is brought to the gins over a long period, requiring the gins to keep open for a small amount of ginning each day, and each gin handles approximately the same volume, the 5–80 plant would be at a decided disadvantage as compared with the 4–80 plant in that the total cost would tend to be greater for operating the larger plant.

TABLE 10.—INDICATED AVERAGE TOTAL EXPENSE OF GINNING 100 POUNDS OF SEED COTTON ON 4–80, 5–80, AND DOUBLE PLANTS, AT SPECIFIED VOLUMES

| Bales ginned | Total expense[1] per 100 pounds of seed cotton ginned on— | | | Bales ginned | Total expense[1] per 100 pounds of seed cotton ginned on— | | |
|---|---|---|---|---|---|---|---|
| | 4–80 plants | 5–80 plants[2] | Double plants[3] | | 4–80 plants | 5–80 plants[2] | Double plants[3] |
| | *Cents* | *Cents* | *Cents* | | *Cents* | *Cents* | *Cents* |
| 1,000 | 31.5 | 39.7 | ..... | 4,500 | 15.0 | 15.5 | 19.8 |
| 1,500 | 24.4 | 29.4 | ..... | 5,000 | ..... | 14.9 | 18.7 |
| 2,000 | 20.9 | 24.2 | ..... | 5,500 | ..... | 14.3 | 17.8 |
| 2,500 | 18.8 | 21.1 | ..... | 6,000 | ..... | ..... | 17.0 |
| 3,000 | 17.4 | 19.0 | ..... | 6,500 | ..... | ..... | 16.3 |
| 3,500 | 16.3 | 17.5 | 23.0 | 7,000 | ..... | ..... | 16.0 |
| 4,000 | 15.6 | 16.4 | 21.3 | | | | |

[1] The expense figures per 100 pounds of seed cotton may be converted into per bale expenses by multiplying each average by the number of 100 pounds of seed cotton required to gin out a bale.

[2] Includes, 5–70 and 2, 6–70 plants.

[3] Although data for only 5 plants are included in this group, these results are not materially different when data for 22 other double plants operating in Texas under similar conditions are included.

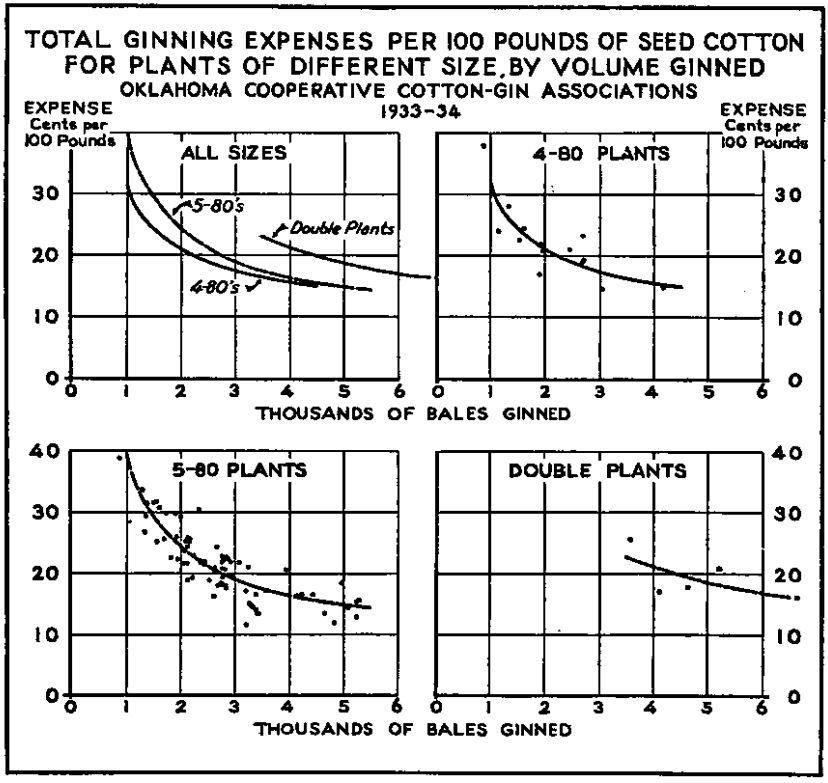


FIGURE 3.—The smaller the gin plant the lower the expenses of ginning as long as the season's volume is less than the normal capacity of the smaller plant.

Cotton ginning is a decidedly seasonal business. A large percentage of the cotton crop is ginned in a relatively short time, the tendency in the ginning industry being to provide plants large enough and in sufficient numbers to handle the current supply of ginnings during the peak season. If the number of gins in a given area, however, is such that by operating on a 24-hour basis they are able to gin each day all of the cotton that is brought to them, these gins will be forced to operate at much under capacity during the first and latter part of the season. For this reason a ginning plant somewhat smaller than necessary to handle the peak load at the height of the season will tend to operate at a lower per unit cost for the season as a whole than a plant sufficiently large to handle the peak load.

It is shown in figure 3 that although in general the greater the volume the less is the per unit expense this does not appear to hold true beyond a certain volume. As indicated by these figures, this limit is reached with 4–80 plants at approximately 4,000 bales and with 5–80 gins at approximately 5,000 bales. It is significant to note that the

ratio of 4,000 bales to 5,000 bales is about the same as the ratio between the number of saws in a 4–80 gin plant (320) and in a 5–80 plant (400).

None of the double-battery and double-plant gins (8–80 or larger) obtained sufficient volume in relation to their size to show the maximum reduction in expenses; but it is reasonable to assume that had these gins obtained such volume in relation to their size as was obtained by the smaller gins, the unit costs would have been approximately the same as for the smaller gins. On the basis of this assumption, the double plants would have reached their maximum efficiency at a volume of approximately 10,000 bales. Based on the number of gin saws, for plants of all sizes represented, no material reduction in per unit expenses resulted after a volume of more than 12½ bales per gin saw was obtained.

As indicated by these data, under conditions existing in 1933–34 with a ginning rate of 20 cents per 100 pounds for picked cotton and 22½ cents for snaps (the rate in Oklahoma during the 1933–34 season), a minimum seasonal volume of approximately six bales of lint, or slightly more than 10,000 pounds of seed cotton per gin saw, must be obtained before a gin plant will begin to show a net income over expenses. Under the same conditions, with an average ginning rate of 25 cents per 100 pounds, these plants would need a volume of only about five bales, or approximately 8,500 pounds of seed cotton, per saw, in order to realize expenses. A volume of 5 bales per saw would mean 1,600 bales for a 4–80 plant, 2,000 bales for a 5–80 plant, and 4,000 bales for a double-battery plant having 10 stands of 80 saws each. It should be mentioned in this connection that expenses of ginning, as used in this analysis, do not include any return on investment. That is, in the above illustration, no return on the investment would be realized for paying interest on borrowed capital or dividends on capital stock, much less any surplus earnings to be returned as a patronage dividend.

The total ginning expense of 4–80 plants as indicated by this analysis was 8.2 cents per 100 pounds of seed cotton less than that of 5–80 plants at a seasonal volume of 1,000 bales—a difference amounting to $1.23 per bale ginned from 1,500 pounds of seed cotton and $1.64 per bale ginned from 2,000 pounds of seed cotton. The advantage of the smaller plants became steadily less as plants of the two sizes were compared at successively higher volumes, until at 4,500 bales the 4–80 plant had an advantage of only 0.5 cent per 100 pounds. It is reasonable to assume that with a seasonal volume of much more than 4,500 bales the advantage of the 4–80 over the 5–80 plant would entirely disappear. Although none of the double plants ginned less than 3,500 bales, the data in table 10 suggests that the total expenses per 100 pounds for these larger plants at volumes

less than 3,500 bales would have been as much above the 5–80 plants at the same volume as 4–80 plants were below.

According to the data in table 10 an association having a seasonal volume of 2,000 bales could save from 50 to 65 cents per bale by operating a 4–80 rather than a 5–80 plant. If the normal expected volume is 4,000 bales or less, it may be ginned more economically with a 4–80 than a 5–80 plant. Recently organized or older cooperative associations buying a new plant should consider these differences in ginning expenses as influenced by size of plant.

It is true, however, that the expense of ginning is not the only factor to be considered in comparing the relative efficiency of plants of different size. The greater convenience and service available with the larger plant may more than compensate for the added expense. This seems particularly true in comparing the expenses of single plants of different size. On the other hand, associations that own two complete plants are frequently forced by their patrons to operate both plants in order to give immediate ginning service during much of the season when the daily volume could be handled with only one plant.

It appears that the size of the gin plant should be somewhat smaller than is needed to handle the daily peak volume during the rush period on a one-shift basis. By storing some of the excess volume of seed cotton each day during the rush season and operating the plant 24 hours a day, if necessary, the daily capacity of a gin plant may be materially increased. Moreover, storage space for seed cotton can be provided more economically than additional gin machinery.

There seems to be no significant difference in the efficiency of 5–80 and 4–80 plants when the two are compared at volumes proportionate to the size of each. As measured by the number of saws, a 4–80 plant is only 80 percent as large as a 5–80 plant. There is very little difference between the average expense per 100 pounds of seed cotton of 5–80 plants at any given volume and 4–80 plants at 80 percent of this volume. For example, the average total expense of 5-80 plants at a volume of 2,500 bales was 21.1 cents per 100 pounds; the average expense of 4–80 plants at a volume of 2,000 bales, or 80 percent of 2,500, was 20.9 cents per 100 pounds (table 10). Even if it is assumed to be significant, the difference of 0.2 cent per 100 pounds of seed cotton would amount to only 3 cents per bale for bales of 1,500 pounds, and 4 cents for bales of 2,000 pounds.

The differences in expenses per unit, indicated by this analysis as being associated with additional intervals of 500 bales in volume, are shown for plants of each size (table 11 and fig. 4). The data in table 11 were calculated from those contained in table 10. For example, average total ginning expense per 100 pounds of seed cotton for 4–80

plants, as shown by table 10, was 31.5 cents at 1,000 bales and 24.4 cents at 1,500 bales. The difference between 31.5 and 24.4, or 7.1 cents, as shown in table 11, is the resulting difference for 4–80 plants in expenses per 100 pounds of seed cotton between those ginning 1,000 bales and those ginning 1,500 bales. Other per 100-pound figures were obtained in a similar manner.

TABLE 11.—REDUCTION IN AVERAGE EXPENSE OF GINNING 100 POUNDS OF SEED COTTON ASSOCIATED WITH 500-BALE INCREASES IN VOLUME FOR 4–80, 5–80, AND DOUBLE PLANTS

| Increase in bales ginned | Reduction[1] in ginning expense per 100 pounds of seed cotton | | | Increase in bales ginned | Reduction[1] in ginning expense per 100 pounds of seed cotton | | |
|---|---|---|---|---|---|---|---|
| | 4–80 plants | 5–80 plants[2] | Double plants[3] | | 4–80 plants | 5–80 plants[2] | Double plants[3] |
| | *Cents* | *Cents* | *Cents* | | *Cents* | *Cents* | *Cents* |
| 1,000 to 1,500 | 7.1 | 10.3 | ..... | 4,000 to 4,500 | 0.6 | 0.9 | 1.5 |
| 1,500 to 2,000 | 3.5 | 5.2 | ..... | 4,500 to 5,000 | ..... | .6 | 1.1 |
| 2,000 to 2,500 | 2.1 | 3.1 | ..... | 5,000 to 5,500 | ..... | .6 | .9 |
| 2,500 to 3,000 | 1.4 | 2.1 | ..... | 5,500 to 6,000 | ..... | ..... | .9 |
| 3,000 to 3,500 | 1.1 | 1.5 | ..... | 6,000 to 6,500 | ..... | ..... | .7 |
| 3,500 to 4,000 | .7 | 1.1 | 1.7 | 6,500 to 7,000 | ..... | ..... | .3 |

[1] Amount by which expenses were lowered.
[2] Includes five 5–70 and two 6–70 plants.
[3] Includes data for only 5 double plants.

The indicated differences in total expenses of 4–80 plants at 1,000 bales and at 1,500 bales is 7.1 cents per 100 pounds of seed cotton, while the difference between a 3,500- and 4,000-bale volume for plants of this size is only 0.7 cents. Similar tendencies are observed for plants of other sizes with respect to the difference in per unit expenses. It is significant, however, that for each group of plants of larger size there is a more pronounced diminution of the difference in expenses at higher points of volume. For example, for the 5–80 plants, 10.3 cents difference is observed between plants ginning 1,000 bales and those ginning 1,500 bales, as compared to 7.1 cents for the 4–80 plants; likewise the difference in expenses of 5–80 plants ginning 3,500 bales and 4,000 bales is 1.1 cents and for 4–80 plants, only 0.7 cent. Double-battery plants compared at these volumes showed a difference of 1.7 cents, which is slightly more than for 5–80 plants. Similar computations might be made for intervals of volume greater than 500 bales.

With respect to reduction in expenses, securing additional volume is very important to an association that has a low volume relative to the size of the plant, but it becomes less and less important at higher volumes. Although not conclusively shown by these figures, there obviously is a point in volume for gins of each size group beyond which no additional reduction in per unit expenses could be obtained with additional volume.

In the relationship between volume and per unit expenses, a cooperative gin is in a position somewhat different from that of an ordinary commercial gin. Since patronage dividends of a cooperative gin are paid on a per unit basis, the dividends per unit will not be increased by additional volume after the point is reached at which no further reduction in per unit cost is obtained. At this point a cooperative gin is operating at maximum efficiency; and increased volume obtained by expanding membership or other means, would result in wearing out the plant more rapidly by reason of the additional volume, with no greater return per bale. For a commercial gin, on the other hand, additional volume would net the owners more total income as long as the revenue per bale was larger than the expense per bale.

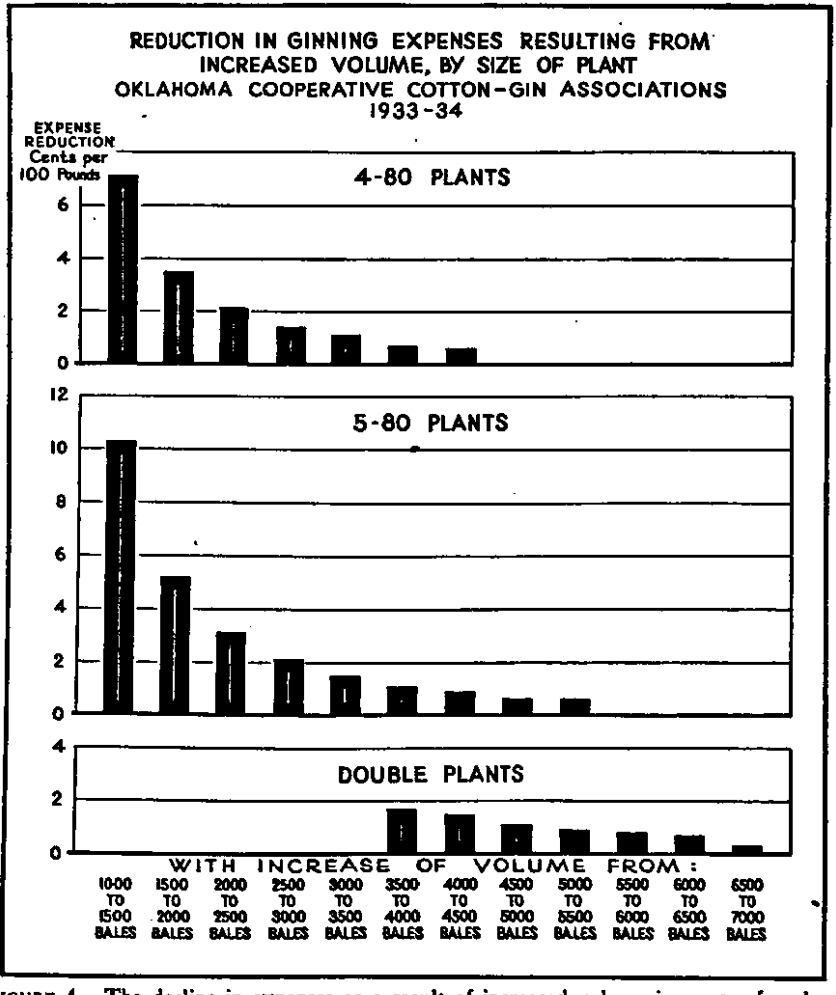


FIGURE 4.—The decline in expenses as a result of increased volume is greater for plants of each larger size.

If activities are to be confined to ginning and handling cottonseed, opportunities arise, particularly in the southeastern cotton States, for associations having relatively few members to operate three-stand or even two-stand gin plants. They can be operated by a very small crew and at relatively low overhead cost for management. For example, a competent ginner with two or three helpers could easily operate a two- or three-stand plant; and under an active and interested board of directors, he could act as both manager and head ginner. By keeping a carbon or duplicate copy of all checks, tickets, invoices, and other similar records, the actual bookkeeping for the small membership could be deferred until after the close of the ginning season.

Small plants can be operated more nearly at capacity throughout the ginning season. They are likewise easily adapted to intermittent or part-time ginning. Moreover, besides avoiding the difficulties associated with large memberships, a genuine interest in cooperative effort could perhaps be developed more easily in these associations without the overemphasized desire for large and immediate financial returns. In many communities, as few as 10 or 20 farm-operators together with their tenants could very profitably operate a cooperative gin plant of two or three stands. Given adequate storage space for seed cotton during the peak season, a two- or three-stand plant would gin a relatively large volume of cotton. A two-stand plant operating 24 hours per day during the peak season should be able to gin approximately the same amount of cotton as a four-stand plant operating only 12 hours per day.

*Operating expenses.*—Actual operating expenses vary approximately in proportion to variations in volume ginned; therefore per unit operating expenses are not related to volume. At volumes above 2,000 bales operating expenses per unit are not materially affected by

TABLE 12.—INDICATED AVERAGE OPERATING EXPENSE FOR GINNING 100 POUNDS OF SEED COTTON ON 4–80, 5–80, AND DOUBLE PLANTS, AT SPECIFIED VOLUMES

| Bales ginned | Average operating expense per 100 pounds of seed cotton ginned on— | | | Bales ginned | Average operating expense per 100 pounds of seed cotton ginned on— | | |
|---|---|---|---|---|---|---|---|
| | 4–80 plants | 5–80 plants [1] | Double plants [2] | | 4–80 plants | 5–80 plants [1] | Double plants [2] |
| | *Cents* | *Cents* | *Cents* | | *Cents* | *Cents* | *Cents* |
| 1,000 | 10.5 | 13.5 | ..... | 4,500 | 9.1 | 8.5 | 9.0 |
| 1,500 | 9.8 | 11.4 | ..... | 5,000 | ..... | 8.4 | 8.9 |
| 2,000 | 9.6 | 10.3 | ..... | 5,500 | ..... | 8.3 | 8.8 |
| 2,500 | 9.4 | 9.7 | ..... | 6,000 | ..... | ..... | 8.8 |
| 3,000 | 9.3 | 9.3 | ..... | 6,500 | ..... | ..... | 8.7 |
| 3,500 | 9.2 | 9.0 | 9.2 | 7,000 | ..... | ..... | 8.7 |
| 4,000 | 9.1 | 8.7 | 9.1 | | | | |

[1] Includes five 5–70 and two 6–70 plants.

[2] Includes data for only 5 double plants.

either size of plant or volume ginned (table 12 and fig. 5). Very little of the difference in average total ginning expenses of plants of different sizes results from differences in operating expenses (labor, fuel, lubrication, repairs, supplies, and miscellaneous). Except for a slight advantage of 4–80 and 5–80 plants at volumes of less than 3,000 bales, the average operating expenses per unit were about the same irrespective of size of plant or volume.

The difference in the average operating expense of 4–80 plants was only 0.5 cent per 100 pounds of seed cotton between plants ginning 2,000 bales and those ginning 4,500 bales. For bales of 1,500 pounds of seed cotton, this 1,500-bale difference in volume would amount to a difference in operating expenses of only 7.5 cents per bale, and for bales of 2,000 pounds, 10 cents. Corresponding figures for 5–80 plants would amount to approximately 27 cents per bale for bales of 1,500 pounds of seed cotton and 36 cents per bale for bales of 2,000 pounds of seed cotton.

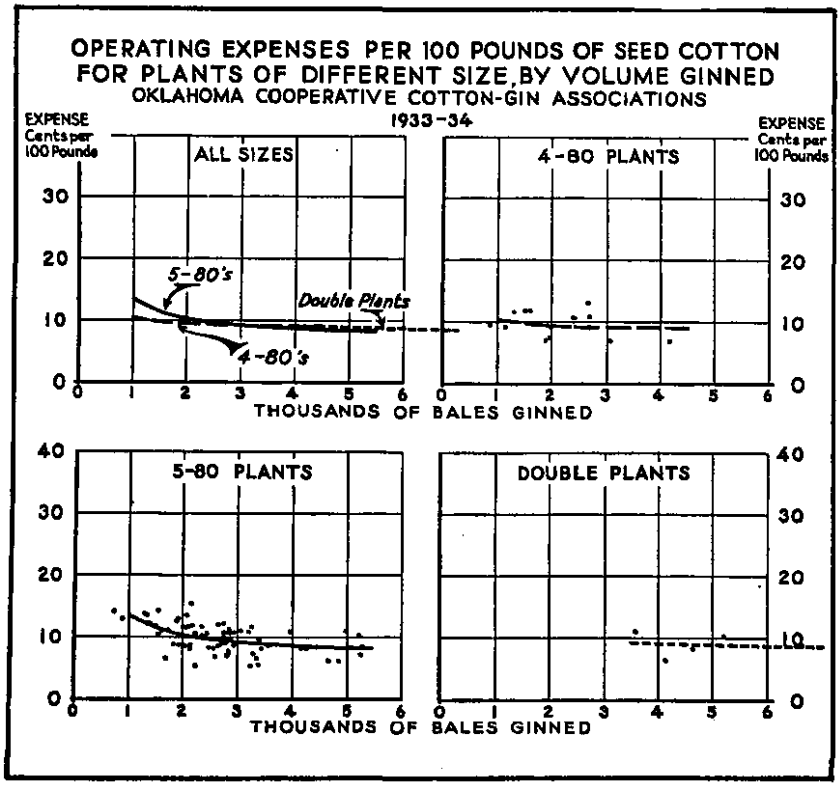


FIGURE 5.—The combined expense for labor, fuel, repairs, and supplies per 100 pounds of seed cotton is not materially influenced by either size of plant or volume ginned.

*Fixed expenses.*—Most of the indicated differences in average total expenses of gin plants of different size appears under fixed expenses. That is, the smaller the gin plant the lower the per unit expense for insurance, taxes, and depreciation. Moreover, most of the differences in average total expenses between plants ginning low and high volumes may be accounted for by the differences in the fixed expenses (table 13, fig. 6).

TABLE 13.—INDICATED AVERAGE FIXED EXPENSE FOR GINNING 100 POUNDS OF SEED COTTON ON 4-80, 5-80, AND DOUBLE PLANTS, AT SPECIFIED VOLUMES

| Bales ginned | Average fixed expense per 100 pounds of seed cotton ginned on— | | | Bales ginned | Average fixed expense per 100 pounds of seed cotton ginned on— | | |
|---|---|---|---|---|---|---|---|
| | 4-80 plants | 5-80 plants [1] | Double plants [2] | | 4-80 plants | 5-80 plants [1] | Double plants [2] |
| | *Cents* | *Cents* | *Cents* | | *Cents* | *Cents* | *Cents* |
| 1,000 | 14.4 | 18.9 | ..... | 4,500 | 3.9 | 4.0 | 7.2 |
| 1,500 | 9.9 | 12.5 | ..... | 5,000 | ..... | 3.5 | 6.7 |
| 2,000 | 7.6 | 9.3 | ..... | 5,500 | ..... | 3.2 | 6.5 |
| 2,500 | 6.3 | 7.4 | ..... | 6,000 | ..... | ..... | 6.1 |
| 3,000 | 5.4 | 6.1 | ..... | 6,500 | ..... | ..... | 5.8 |
| 3,500 | 4.7 | 5.1 | 8.5 | 7,000 | ..... | ..... | 5.7 |
| 4,000 | 4.3 | 4.5 | 7.8 | | | | |

[1] Includes 5, 5-70 and 2, 6-70 plants.

[2] Includes data for only 5 double plants.

The total amount of fixed expenses does not increase at the same rate as some other expenses when volume increases. Thus the per unit expense for these items decreases rapidly with increased volume. From the standpoint of fixed expenses, therefore, volume ginned is of more importance than for any of the other groups of expenses.

The method used in this analysis for estimating depreciation expense does not give any consideration to the effect of volume ginned on depreciation of the plant. Taxes are increased by volume only to the extent that sales taxes, check taxes, and State income taxes, when paid, reflect volume ginned. Since the expense for insurance includes pay roll or compensation insurance this item would tend to increase slightly with the amount expended for labor.

The differences in fixed expenses for plants of different size account for more than half of the differences in total expenses. Fixed expenses make up from 25 to 45 percent of the total expenses, depending on volume ginned. When a plant of a given size is once acquired, the annual fixed expense for insurance, taxes, and depreciation is more or less determined for the entire life of the gin plant. Therefore, when the cooperative is first organized or when a new plant is built, the board of directors has a very important decision to make in selecting the size of plant. The directors should attempt to select the smallest size that will handle their expected volume during the life of the plant.

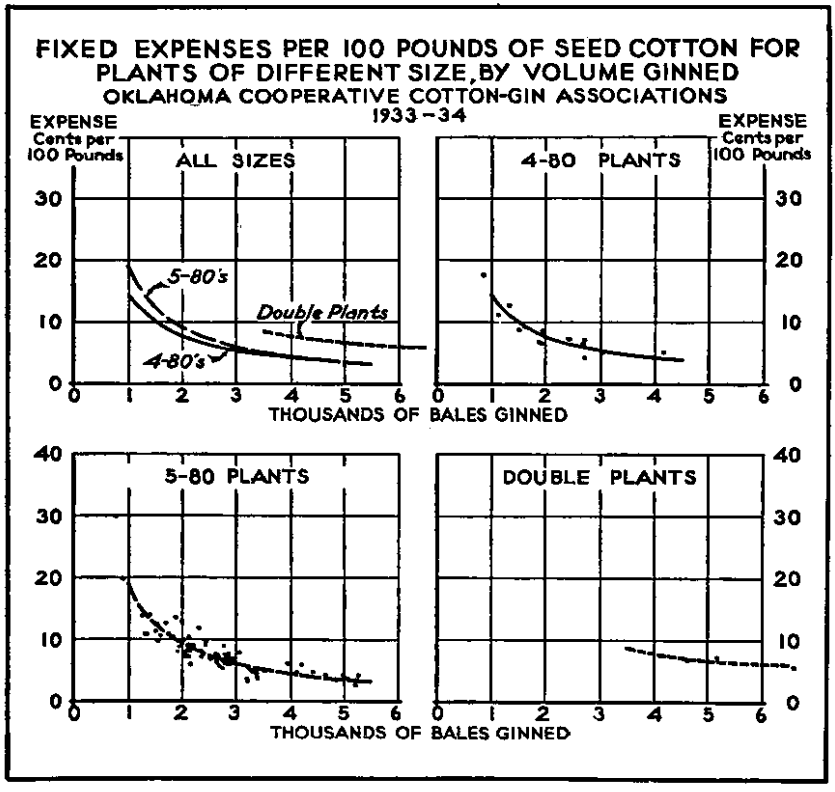


FIGURE 6.—Most of the differences in the per unit expense of plants of different size, as well as most of the decline in per unit expense resulting from increased volume, occurs in the expenses for insurance, taxes, and depreciation.

*Administrative expenses.*—These data indicate that the smaller the plant the lower the administrative expenses at the same volume. For example, at a volume of 3,500 bales these expenses averaged 5.3 cents per 100 pounds for double plants, 3.4 cents for 5–80 plants, and 2.4 cents for 4–80 plants. In general the average administrative expenses were slightly lower at the same volume for each smaller size group of plants (table 14 and fig. 7). The difference between 4–80 and 5–80 plants was approximately 1 cent per 100 pounds regardless of volume. For the plants of each size group, administrative expenses per unit were less for plants having a high volume as compared to those having a low volume. This difference was more pronounced than that observed for operating expenses, but less than that for fixed expenses. The difference in administrative expenses between plants of the same size at different volumes does not appear large; however, in proportion to the relative amount of these expenses, the reduction is important. For example, the difference in average administrative expenses between 5–80 plants at volumes of 2,000 and 3,000 bales was only 1 cent

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per 100 pounds of seed cotton. This 1 cent, however, was nearly 22 percent of the per unit administrative expense of 4.6 cents at 2,000 bales, or a reduction of more than one-fifth.

TABLE 14.—INDICATED AVERAGE ADMINISTRATIVE EXPENSE FOR GINNING 100 POUNDS OF SEED COTTON ON 4–80, 5–80, AND DOUBLE PLANTS AT SPECIFIED VOLUMES

| Bales ginned | Average administrative expense per 100 pounds of seed cotton ginned on— | | | Bales ginned | Average administrative expense per 100 pounds of seed cotton ginned on— | | |
|---|---|---|---|---|---|---|---|
| | 4–80 plants | 5–80 plants [1] | Double plants [2] | | 4–80 plants | 5–80 plants [1] | Double plants [2] |
| | Cents | Cents | Cents | | Cents | Cents | Cents |
| 1,000 | 6.6 | 7.3 | | 4,500 | 2.0 | 3.0 | 3.6 |
| 1,500 | 4.7 | 5.5 | | 5,000 | | 3.0 | 3.1 |
| 2,000 | 3.7 | 4.6 | | 5,500 | | 2.6 | 2.8 |
| 2,500 | 3.1 | 4.0 | | 6,000 | | | 2.1 |
| 3,000 | 2.7 | 3.6 | | 6,500 | | | 1.8 |
| 3,500 | 2.4 | 3.4 | 5.3 | 7,000 | | | 1.6 |
| 4,000 | 2.2 | 3.2 | 4.4 | | | | |

[1] Includes 5, 5–70 and 2, 6–70 plants.

[2] Includes data for only 6 double plants.

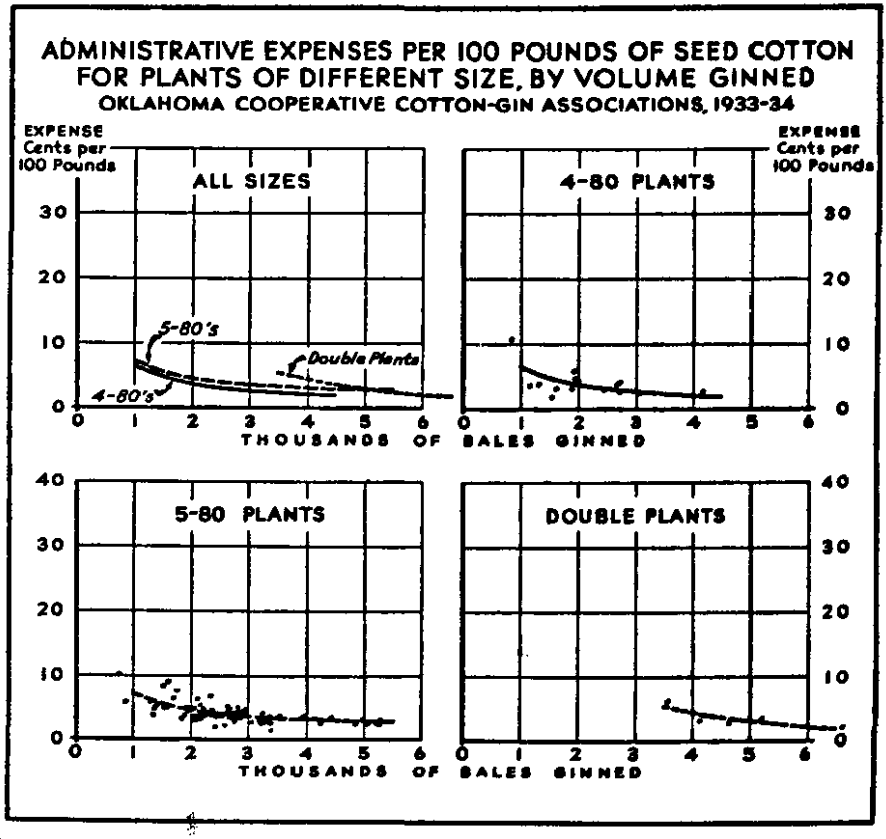



FIGURE 7.—The overhead expenses connected with management and the office are lower per unit of volume for each smaller-size group of plants.

It might be expected that the smaller plants would have as high or even higher administrative expenses per 100 pounds than larger plants, since plants of either size would require about the same type of manager. However, in the smaller plants, the manager frequently does the office work; and in some instances also works with the gin crew. Moreover the manager and other employees are hired on a seasonal rather than an annual basis in the smaller plants more often than in the larger plants.

*Relative importance of operating, fixed, and administrative expenses.*—The foregoing discussion of ginning expenses in relation to size of plant and volume is based on the expenses per 100 pounds of seed cotton. If each of the three groups of expenses (operating, fixed, and administrative) is expressed as a percent of the total expense, the importance of each group may be examined in its relation to volume (table 15 and fig. 8).

TABLE 15.—INDICATED AVERAGE OPERATING, FIXED, AND ADMINISTRATIVE EXPENSES AS PERCENTAGES OF TOTAL EXPENSE, BY SIZE OF PLANT AND AT SPECIFIED VOLUMES

| Bales ginned and size of plant | Expense groups as a percentage of total expense | | | | Bales ginned and size of plant | Expense groups as a percentage of total expense | | | |
|---|---|---|---|---|---|---|---|---|---|
| | Operating expense | Fixed expense | Administrative expense | Total | | Operating expense | Fixed expense | Administrative expense | Total |
| 4-80 plants: | *Percent* | *Percent* | *Percent* | *Percent* | 5-80 plants:[1]— | *Percent* | *Percent* | *Percent* | *Percent* |
| 1,000 | 33 | 46 | 21 | 100 | Continued | | | | |
| 2,000 | 46 | 36 | 18 | 100 | 4,000 | 53 | 27 | 20 | 100 |
| 3,000 | 53 | 31 | 16 | 100 | 5,000 | 56 | 24 | 20 | 100 |
| 4,000 | 59 | 27 | 14 | 100 | Double plants:[2] | | | | |
| 5-80 plants:[1] | | | | | 4,000 | 43 | 37 | 20 | 100 |
| 1,000 | 34 | 47 | 19 | 100 | 5,000 | 48 | 36 | 16 | 100 |
| 2,000 | 43 | 38 | 19 | 100 | 6,000 | 51 | 36 | 13 | 100 |
| 3,000 | 49 | 32 | 19 | 100 | 7,000 | 54 | 36 | 10 | 100 |

[1] Includes 5, 5-70 and 2, 6-70 plants.

[2] Based on data for only 5 double plants.

At all volumes represented above 1,000 bales (table 15) operating expenses (labor, fuel, repairs, and similar items) account for the largest part of the total expenses for plants of each size. At higher volumes this group of expenses makes up an increasing percentage of the total expenses. At the same volume, operating expenses generally make up a greater percentage of the total expenses for the plants of each smaller-size group. The increase in this proportion is more rapid with increased volume for the smaller than for the larger plants. This explains why the expenses of smaller plants can be more readily adjusted to lower volume.

Operating expenses, therefore, offer the greatest opportunity for reduction in the per unit expenses of ginning cotton. Means of lower-

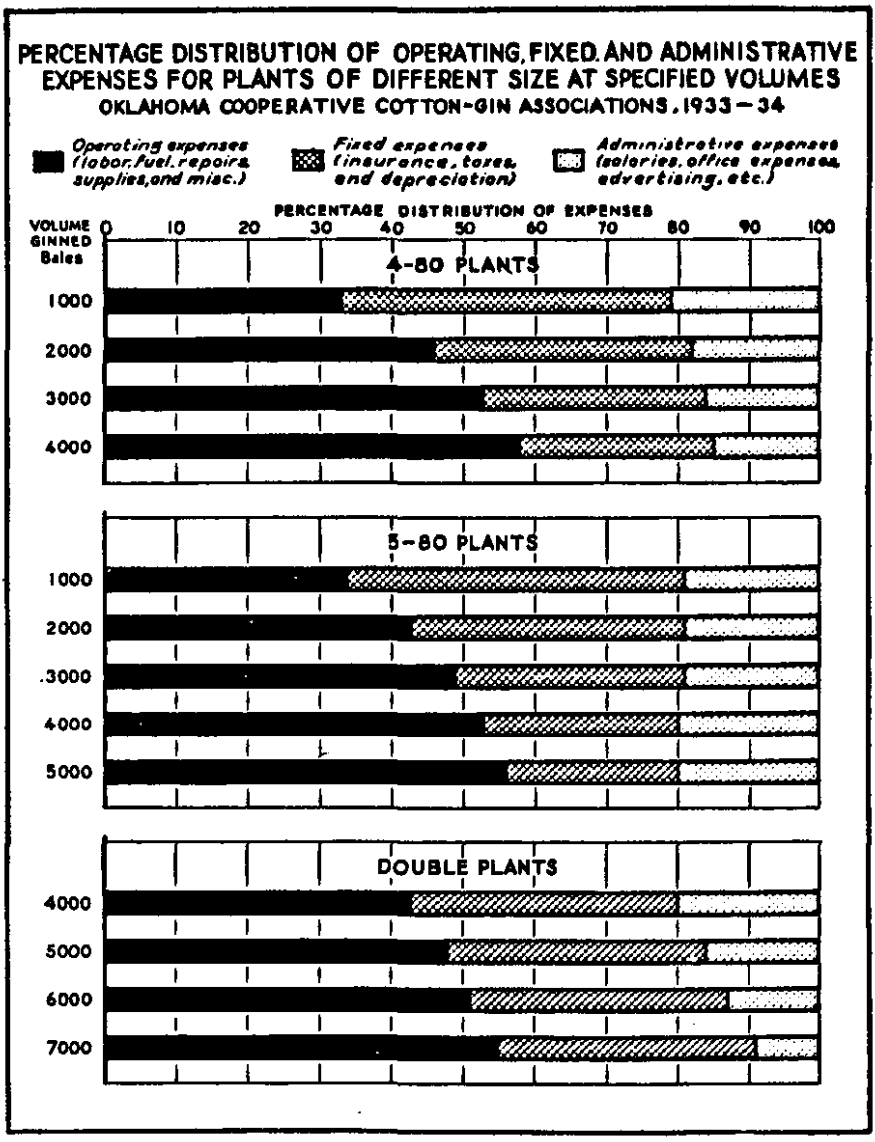



FIGURE 8.—As the volume ginned increases, operating expense makes up an increasing proportion of total expense, and administrative expense a smaller proportion.

ing them have been found by several experienced managers. One manager reduced the expense for repair labor by using the ginning crew on days of intermittent ginning during the latter part of the season to make all of the necessary machinery repairs for the following season. Others reduced power costs by testing certain units of the gin machinery, such as fans, for the most effective speed. Gin plants using electric power especially, show a prompt decrease in expense when the efficiency of the several units of the gin machinery is in-

creased, because the amount of electric current required varies with the efficiency with which the different units of the machinery are operated, and also because the expense for current for electric plants makes up a greater percentage of the total expense than the fuel expense for coal, gas, or oil of plants with other types of power.

At the same volume fixed expenses generally make up a smaller proportion of the total expense for plants of each smaller size. With increased volume, fixed expenses tend to become a smaller percent of the total. The fixed expenses for the double plants make up a much greater percentage of the total than they do for 4–80 or 5–80 plants. For example, at 4,000 bales volume fixed expenses (insurance, taxes, and depreciation) make up 37 percent of the total expenses of double plants and only 27 percent of the total for 4–80 and 5–80 plants.

Administrative expenses generally account for a greater proportion of the total expense for 5–80 plants than for either larger or smaller ones. For the 5–80 plants the proportion was about the same regardless of volume. Administrative expenses declined in proportion to the total expense for plants both smaller and larger than 5–80's when volume increased.

### *Type of Power and Volume Ginned*

*Effect on total expense.*—Differences in average total expense because of the type of power are very small as compared with those resulting from the size of the gin plant. At volumes between 1,500 and 3,500 bales per 5–80 equivalent plant, the difference in total expenses between any two types of power did not exceed 2 cents per 100 pounds of seed cotton ginned (table 16 and fig. 9).

TABLE 16.—INDICATED AVERAGE TOTAL EXPENSE OF GINNING 100 POUNDS OF SEED COTTON AT SPECIFIED VOLUMES, BY TYPES OF POWER

| Bales ginned [1] | Average total ginning expenses per 100 pounds of seed cotton ginned on plants using— | | | Bales ginned [1] | Average total ginning expenses per 100 pounds of seed cotton ginned on plants using— | | |
|---|---|---|---|---|---|---|---|
| | Steam power | Electric power | Oil power [2] | | Steam power | Electric power | Oil power [2] |
| | *Cents* | *Cents* | *Cents* | | *Cents* | *Cents* | *Cents* |
| 1,000 | 39.1 | 36.9 | 40.8 | 3,500 | 17.4 | 18.7 | 16.7 |
| 1,500 | 29.0 | 28.4 | 29.6 | 4,000 | 16.3 | 17.8 | 15.6 |
| 2,000 | 23.9 | 24.2 | 24.0 | 4,500 | 15.5 | 17.1 | 14.6 |
| 2,500 | 20.9 | 21.6 | 20.6 | 5,000 | 14.8 | 16.6 | 13.9 |
| 3,000 | 18.9 | 19.9 | 18.3 | | | | |

[1] Per 5–80 equivalent plants.

[2] Includes 2 plants using natural-gas power.

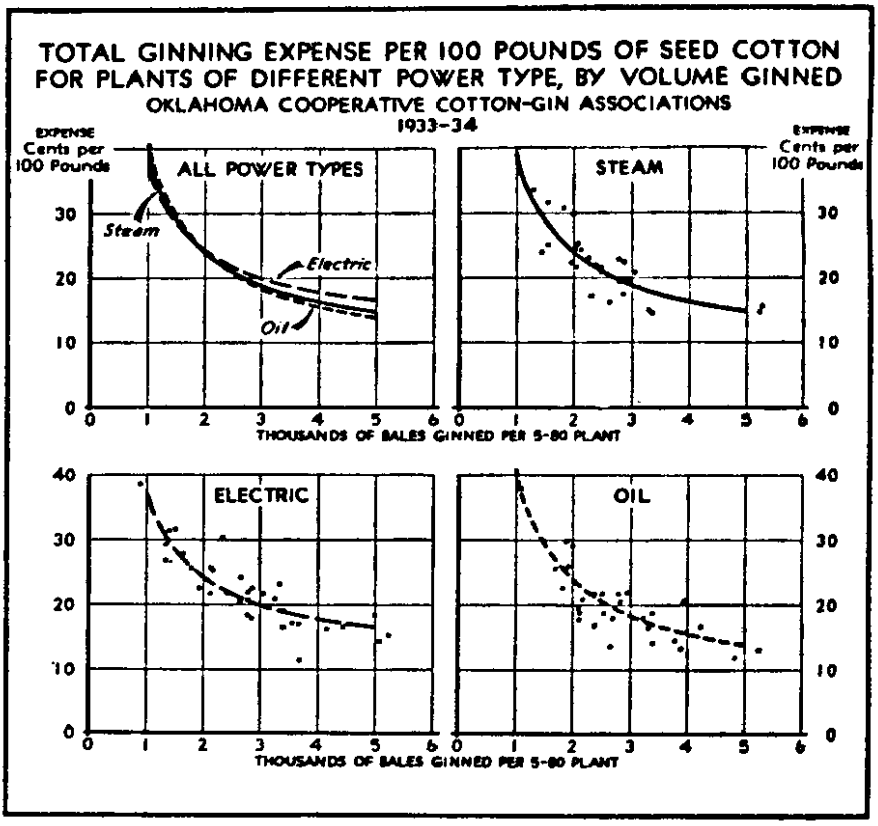



FIGURE 9.—At a volume of approximately 2,000 bales for a 5–80 equivalent plant, there is very little difference in the average ginning expenses of steam, electric, and oil plants. At volumes less than 2,000 bales, oil plants had the highest expense; at volumes greater than 2,000 bales, electric plants had the highest expense.

As shown in table 9, there were 36 electric plants, 29 steam plants, 26 oil plants, 2 natural-gas plants, and 2 double plants using both steam and oil power. The two natural-gas plants were included with the oil group. One of the double plants, using both steam and oil power, was included in each of the two power-type groups—steam and oil.

There was possibly some variation in expenses among the steam plants because of the kind of fuel used. A majority of these plants used coal, but some used fuel oil, natural gas, or a combination of burrs with coal, oil, or natural gas. The electric rate was 3 cents per kilowatt-hour for all but two or three of the plants using electric power.

The average ginning expenses according to the power type were determined in the same way as the average expenses according to the size of the plants. As previously mentioned, however, allowance was made for the effect of the size of the plant on expenses by adjusting

the volume of each plant larger or smaller than 5–80 to the number of bales ginned per 400 saws; that is, per 5–80 equivalent. These results, therefore, are in terms of 5–80 plants.

At a volume of approximately 2,000 bales for a 5–80 plant, there was no significant difference in the total ginning expenses because of the type of power. With a volume of less than 2,000 bales, the plants using electric power operated at a slightly lower rate of expense than plants using steam or oil power. With a volume of more than 2,000 bales, however, the plants using electricity operated at a slightly higher expense than plants employing steam or oil power. The advantage held by the electric plants in the lower-volume groups is partly because the current for power is used only when ginning is being done. However, when a minimum service charge is made for the use of electric current instead of the flat rate per kilowatt-hour electric plants in the lower-volume groups are at a disadvantage. Oil plants, or those using natural gas also are somewhat better adapted to intermittent ginning than steam plants.

According to the data obtained, plants using oil power had lower average expenses than plants using steam power when a volume of more than 2,000 bales was ginned during the season, but average expenses higher than those of steam plants when a volume of less than 2,000 bales was ginned. The higher expenses of oil plants, as compared with steam plants at volumes below 2,000 bales, is probably because of the greater amount of depreciation on the oil plants. This is true, even assuming that the useful life of an oil engine is the same as that of a steam plant. As will be shown later, even though the oil plants would have lower expenses for fuel alone than the steam plants, especially with low volume, the item of depreciation, and to some extent insurance and taxes, on the more costly oil-power unit gives the steam plant a slight advantage in total expenses per unit of volume at volumes less than 2,000 bales per season.

A comparison of the average expenses of plants leads to the conclusion that there was no marked difference in expenses of operation resulting from the use of different types of power. The average differences shown at all volumes above 1,000 bales are less than 2 cents per 100 pounds of seed cotton ginned, or not more than 25 cents per bale. These figures should discourage any cooperative gin association from inadvisably junking and replacing a reasonably good power unit in an attempt to lower power expenses.

Local facilities and conditions are perhaps the chief factors influencing a decision as to the best type of power to use for any plant. In some localities, oil and steam plants are at a disadvantage because of the water supply; in other sections, steam plants are economical because burs may be used for fuel. Likewise, electricity is expensive

in some areas, especially in those where a high initial service charge is made instead of a flat rate, when only a small amount of current is used in ginning a small volume.

*Influence on individual items of expense.*—Although the average total ginning expense per 100 pounds is not materially affected by type of power, there are, in some instances, wide differences in individual items of expense between plants having different types of power (table 17 and fig. 10).

TABLE 17.—INDICATED AVERAGE EXPENSE PER 100 POUNDS OF SEED COTTON FOR SELECTED ITEMS, BY TYPES OF POWER AND AT SPECIFIED VOLUMES

| Bales ginned [1] | Average expense per 100 pounds of seed cotton for— | | | | |
|---|---|---|---|---|---|
| | Labor | Fuel and lubricating oil | Repairs and supplies | Insurance and taxes [2] | Depreciation |
| Steam plants: | *Cents* | *Cents* | *Cents* | *Cents* | *Cents* |
| 1,000 | 5.7 | 4.8 | 4.4 | 5.3 | 11.7 |
| 1,500 | 5.2 | 3.2 | 3.5 | 4.0 | 7.7 |
| 2,000 | 5.0 | 2.4 | 3.0 | 3.3 | 5.8 |
| 2,500 | 4.9 | 1.9 | 2.8 | 2.9 | 4.6 |
| 3,000 | 4.8 | 1.6 | 2.6 | 2.6 | 3.8 |
| 3,500 | 4.7 | 1.3 | 2.5 | 2.4 | 3.2 |
| 4,000 | 4.7 | 1.2 | 2.4 | 2.3 | 2.8 |
| 4,500 | 4.6 | 1.0 | 2.3 | 2.2 | 2.5 |
| 5,000 | 4.6 | .9 | 2.2 | 2.1 | 2.2 |
| Electric plants: | | | | | |
| 1,000 | 5.2 | 5.7 | 2.6 | 6.4 | 12.3 |
| 1,500 | 4.5 | 4.9 | 2.4 | 4.5 | 7.8 |
| 2,000 | 4.1 | 4.5 | 2.3 | 3.5 | 5.6 |
| 2,500 | 3.9 | 4.3 | 2.3 | 2.9 | 4.2 |
| 3,000 | 3.7 | 4.1 | 2.3 | 2.6 | 3.3 |
| 3,500 | 3.6 | 4.0 | 2.2 | 2.3 | 2.7 |
| 4,000 | 3.5 | 3.9 | 2.2 | 2.1 | 2.2 |
| 4,500 | 3.4 | 3.9 | 2.2 | 1.9 | 1.8 |
| 5,000 | 3.4 | 3.8 | 2.2 | 1.8 | 1.5 |
| Oil plants: [3] | | | | | |
| 1,000 | 6.2 | 2.2 | 3.3 | 6.6 | 14.2 |
| 1,500 | 5.3 | 1.7 | 3.0 | 4.6 | 9.1 |
| 2,000 | 4.8 | 1.5 | 2.9 | 3.5 | 6.5 |
| 2,500 | 4.6 | 1.4 | 2.8 | 3.0 | 5.0 |
| 3,000 | 4.4 | 1.3 | 2.7 | 2.5 | 4.0 |
| 3,500 | 4.2 | 1.3 | 2.7 | 2.3 | 3.2 |
| 4,000 | 4.1 | 1.2 | 2.7 | 2.1 | 2.7 |
| 4,500 | 4.1 | 1.2 | 2.6 | 1.9 | 2.3 |
| 5,000 | 4.0 | 1.1 | 2.6 | 1.8 | 1.9 |

[1] 5–80 equivalent plants.
[2] Federal income and excess-profit taxes not included.
[3] Includes 2 plants using natural-gas power.

The average labor expense per 100 pounds of seed cotton ginned was highest for steam plants and lowest for electric plants; and for oil plants about halfway between the other two. Generally, one more man is required to operate a steam than an electric plant. Some oil plants are operated with a full-time engine man, while others use the ginner to oversee both the gin machinery and the power unit.

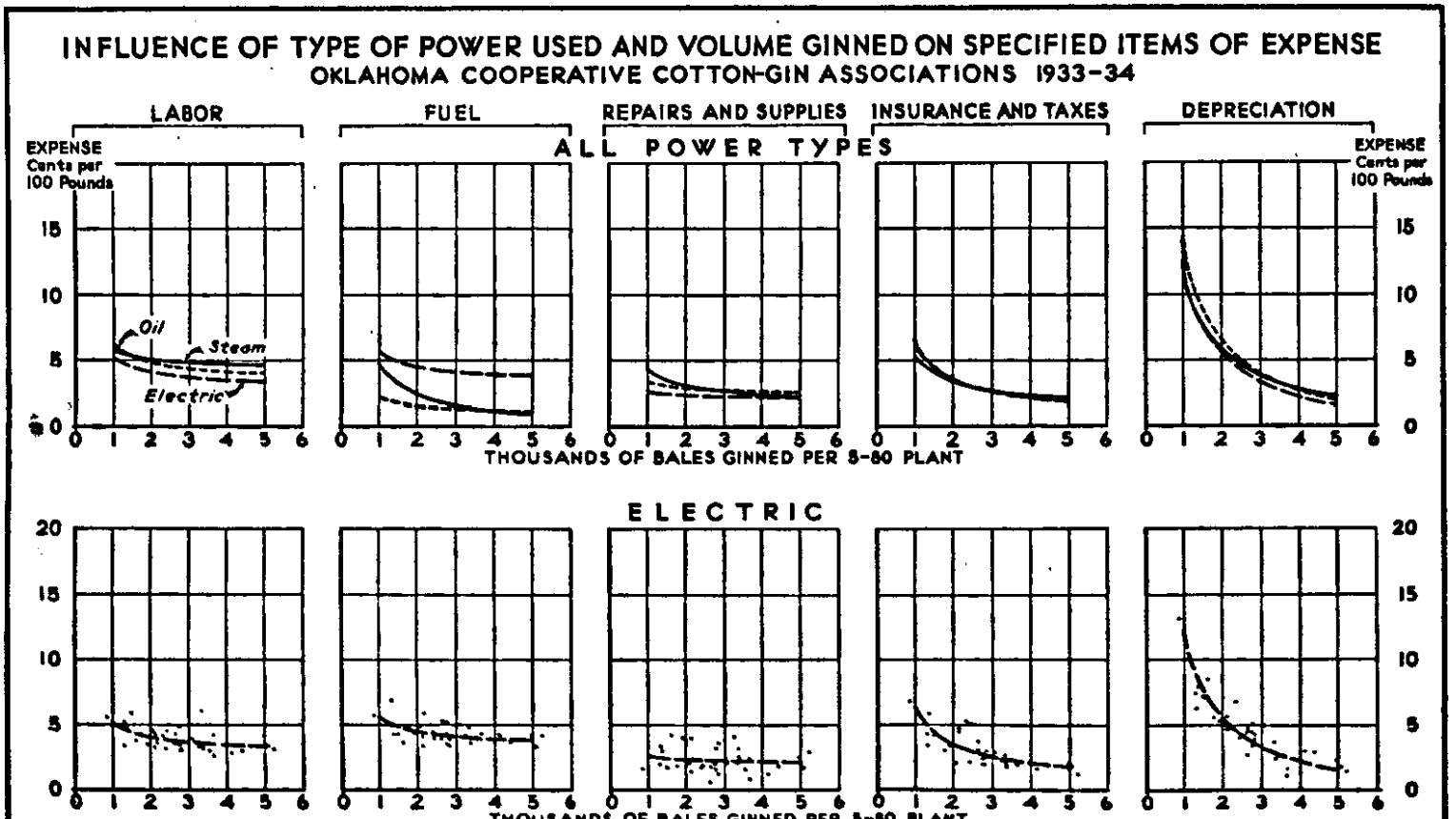
For plants of each power type the average labor expenses per 100 pounds did not materially decrease with increased volume after a volume of 2,000 bales per 5–80 equivalent plant was obtained. Up to 2,000 bales, however, the labor costs per unit were decidedly lower

with increased volume. This indicated that additional volume above 2,000 bales necessitated either a larger crew, higher wages per hour, or more hours of operation. Probably the gin crew was increased by one or two men during the rush period of ginning, while the volume ginned during the rush period as compared to more normal volume would not likely increase proportionately with the pay roll.

To the extent that large volume per day was handled by the regular crew working overtime rather than by an extra night shift, the expenses per unit for labor would be higher with greater volumes, because of the fact that wages are usually paid at a higher rate per hour for overtime than for regular work. Power expenses would increase in total amount but would decrease in per unit of volume during the period the plant was operating at or near capacity.

Average expenses for fuel and lubrication for steam and oil plants per 100 pounds of seed cotton ginned were considerably lower than for current and lubrication for electric plants. Regardless of volume the advantage of oil over electric power for fuel and lubrication remained fairly constant at a difference of about 2.5 cents per 100 pounds of seed cotton. At a 1,000-bale volume, fuel expense was almost as high for steam plants as for electric plants and declined below that of oil plants when more than 4,000 bales was ginned during the season. Obviously this marked decline accompanies increased volume because the cost of maintaining steam pressure is almost as great whether a few bales or maximum volume is ginned daily. On the other hand, electric plants, and to some extent oil plants, use current or fuel only while actually ginning.

The average expenses for repairs, supplies, and miscellaneous items per 100 pounds of seed cotton varied widely from one plant to another, even within the same power group and at approximately the same volume (fig. 10). As a matter of fact, much of the repair expense of most gin plants each year is the result of the previous year's operations rather than those of the current year. That is, the annual overhauling of machinery and equipment is done in the spring and summer months, and the extent of necessary repairs depends usually more on the volume ginned during the previous season than on the volume expected for the approaching season. For this reason, and because of variations in the repair policy from plant to plant, the per unit expenditures for repairs, supplies, and such items are not necessarily applicable to the 1933–34 season. However, to the extent that needed repairs are made each year the annual repair cost would tend to be uniform. Such differences between plants as did show up in these averages, however, were favorable to those plants having electric power, as was to be expected, since the ordinary repairs of a steam or oil motor are more expensive than those of an electric motor.


INFLUENCE OF TYPE OF POWER USED AND VOLUME GINNED ON SPECIFIED ITEMS OF EXPENSE
OKLAHOMA COOPERATIVE COTTON-GIN ASSOCIATIONS 1933-34
LABOR
FUEL
REPAIRS AND SUPPLIES
INSURANCE AND TAXES
DEPRECIATION
ALL POWER TYPES
EXPENSE Cents per 100 Pounds
Oil
Steam
Electric
THOUSANDS OF BALES GINNED PER 5-80 PLANT
ELECTRIC
THOUSANDS OF BALES GINNED PER 5-80 PLANT

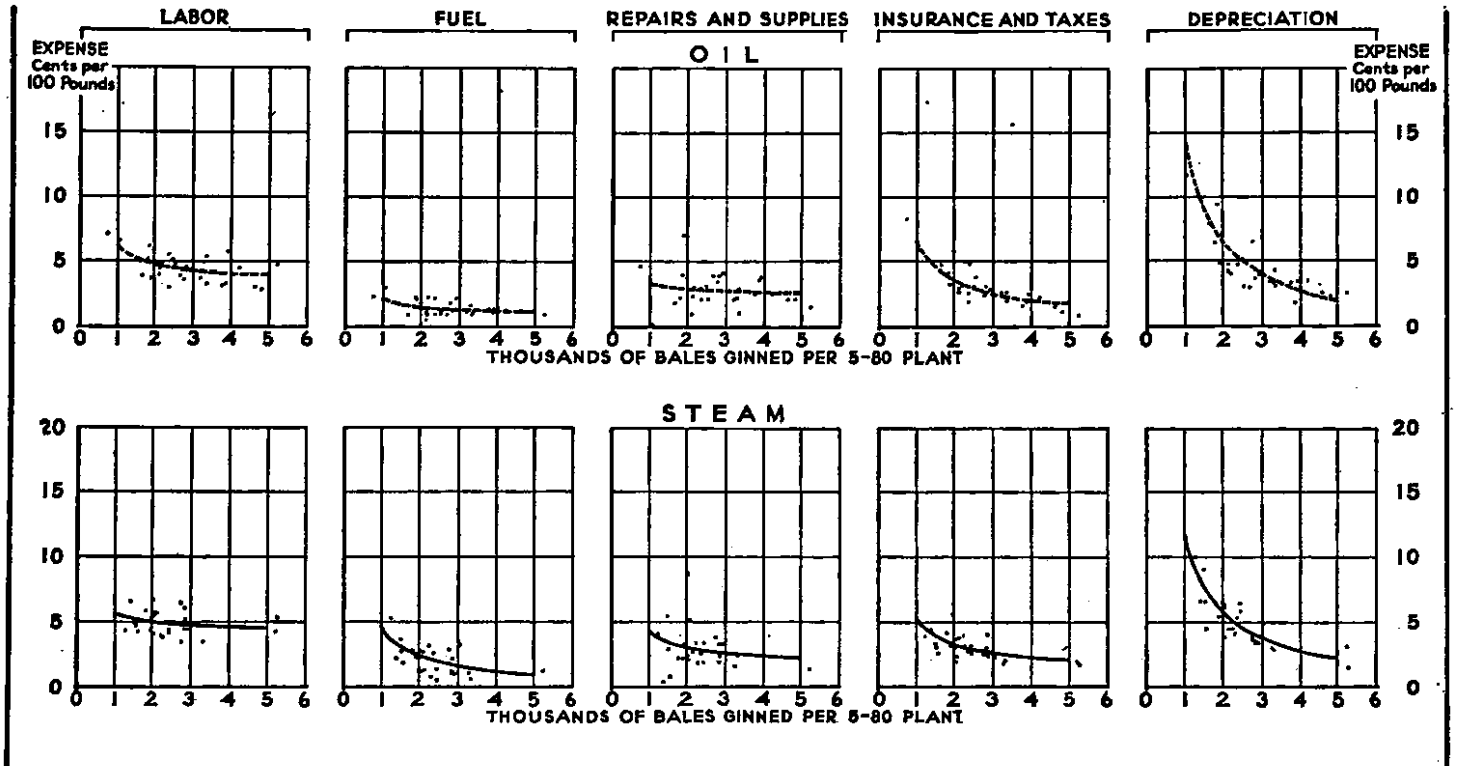



FIGURE 10.—Any one item of expense taken alone sometimes shows wide differences between types. These differences in individual expense items, however, tend to be compensating.

Expenses for repairs, supplies, and such items averaged about one-half cent per 100 pounds higher for oil and gas plants than for electric plants. This difference would amount to about 10 cents per bale. For either electric or oil plants these expenses per unit showed very little decline as comparisons were made between plants at successively higher volumes. That is, as volume increased, expenditures for these items increased accordingly.

For steam plants the per unit expenses for repairs, supplies, and such items were less for plants ginning successively higher volumes. For example, this per-unit expense was 4.4 cents for plants ginning 1,000 bales and 3.0 cents for plants ginning 2,000 bales, or an average difference in favor of the plants with the higher volume of approximately 25 cents per bale. This difference in per unit expense up to a 2,000-bale volume may be explained in part by the more or less complete annual overhauling given a steam engine, irrespective of the volume ginned during the previous season or of the volume expected during the next season.

Insurance and taxes should, to some extent, reflect the value or cost of the buildings and equipment. For this reason it might be expected that the expenses for these items would be more for oil than for steam plants, and in turn more for steam than for electric plants. No significant difference is shown, however, in the average expenses for insurance and taxes per 100 pounds ginned between plants with different kinds of power. Table 17 and figure 10 detail the figures. Local taxes on gin plants do not always reflect the differences in valuation of plants. Likewise, the amount of fire and tornado insurance which an association carries does not in all cases reflect book value of the gin buildings and machinery.

The per unit expenses for insurance and taxes were higher for plants ginning a small volume than for plants ginning a large volume. This emphasizes the fact that these expenses are fixed charges which go on even though the gin plant does not operate. The amount of compensation insurance paid varies directly with the amount of the pay roll and, therefore, with the volume of cotton ginned. The rate of decrease, likewise, in the per unit expenses for the total amount of insurance and taxes tends to become less pronounced at successively higher volume.

Since new gin machinery, as previously stated, together with the power unit, was assumed to have a useful life of 15 years, annual depreciation was calculated at 6⅔ percent of the original cost. Estimating depreciation expense by this method would naturally show those plants with the greatest investment in machinery and buildings to have the greatest depreciation. For this reason, oil plants are shown to have the higher depreciation expense per 100 pounds of seed cotton

ginned, followed in order by steam and electric plants. To the extent that the life of one type of power unit is longer than that of another, these average indicated expenses do not necessarily reflect actual depreciation in the power unit.

These differences in individual items of expense, between gin plants equipped with different types of power, tend to offset one another, with the result that the average total expenses indicated by these data are approximately the same for plants of all power types. For example, the high cost of current for electric plants tends to be offset by lower cost for labor, repairs, and depreciation; the high cost of labor for steam plants is offset in part by a lower fuel cost; likewise, the high cost of depreciation and repairs for oil and gas plants is offset by low fuel costs. In deciding, therefore, on the type of power to be installed in a new plant, or in considering changing from one type of power to another, it is very important that the directors of a cooperative gin association consider the total of all expenses influenced by power rather than any one item such as fuel. However, no hard and fast rules can be laid down for the selection of the most advantageous type of power. As was mentioned above, local facilities and conditions are perhaps the chief factors to be considered in deciding on the most economical and advantageous type of power.

*Relative importance of individual items of expense.*—When the relative amounts of the different items of expense are analyzed, as they are influenced by volume ginned and power type, certain significant relationships are developed that are not so obvious when per unit or absolute expenses are studied. The same basic data used in comparing expenses per 100 pounds of seed cotton was used in comparing individual expense items, each of the specified items being expressed as a

TABLE 18.—ITEMS OF EXPENSE AS PERCENTAGES OF AVERAGE TOTAL EXPENSE BY TYPE OF POWER AND AT SPECIFIED VOLUMES

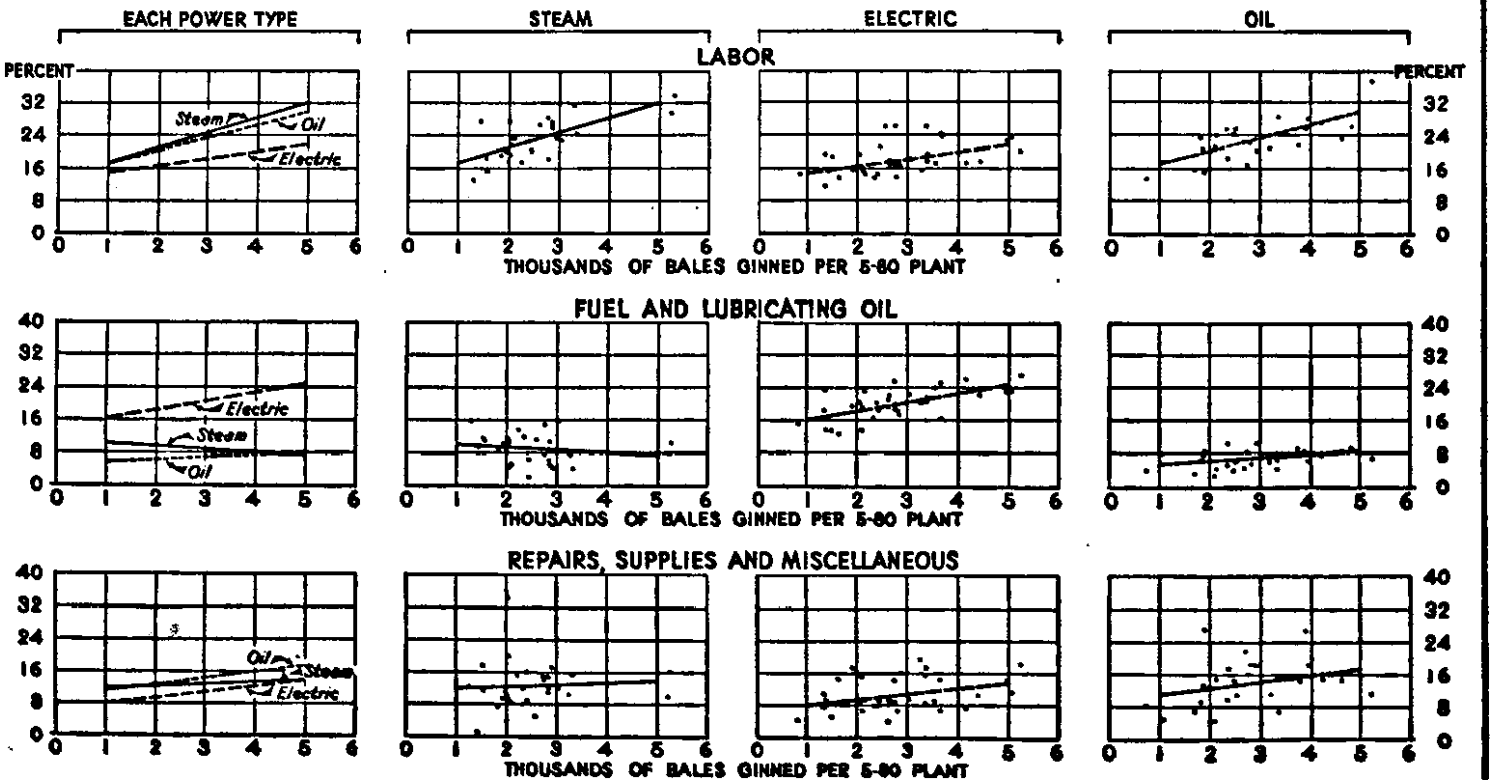
| Bales ginned [1] | Labor | Fuel | Repairs and supplies | Insurance and taxes | Depreciation | Administrative expense |
|---|---|---|---|---|---|---|
| Steam plants: | *Percent* | *Percent* | *Percent* | *Percent* | *Percent* | *Percent* |
| 1,000 | 17.4 | 10.2 | 12.0 | 14.3 | 27.1 | 19.0 |
| 2,000 | 21.1 | 9.5 | 12.4 | 13.9 | 24.1 | 19.0 |
| 3,000 | 24.7 | 8.9 | 13.0 | 13.5 | 21.0 | 18.9 |
| 4,000 | 28.6 | 8.2 | 13.3 | 13.0 | 18.0 | 18.9 |
| 5,000 | 32.2 | 7.5 | 13.9 | 12.6 | 14.9 | 18.9 |
| Electric plants: | | | | | | |
| 1,000 | 14.9 | 16.2 | 8.0 | 16.1 | 27.1 | 17.7 |
| 2,000 | 16.6 | 18.4 | 9.5 | 14.7 | 22.8 | 18.0 |
| 3,000 | 18.4 | 20.6 | 10.9 | 13.1 | 18.7 | 18.3 |
| 4,000 | 20.1 | 22.7 | 12.4 | 11.8 | 14.3 | 18.7 |
| 5,000 | 21.9 | 24.8 | 13.8 | 10.4 | 10.0 | 19.1 |
| Oil plants: [2] | | | | | | |
| 1,000 | 17.2 | 5.8 | 11.3 | 17.1 | 29.3 | 19.3 |
| 2,000 | 20.4 | 6.4 | 12.8 | 15.5 | 25.8 | 19.1 |
| 3,000 | 23.5 | 7.0 | 14.4 | 13.8 | 22.5 | 18.8 |
| 4,000 | 26.7 | 7.6 | 16.0 | 12.0 | 19.2 | 18.5 |
| 5,000 | 29.9 | 8.2 | 17.5 | 10.3 | 15.9 | 18.2 |

[1] Per 5–80 equivalent plant.

[2] Includes 2 plants using natural gas power.

# PERCENTAGE DISTRIBUTION OF SPECIFIED ITEMS OF EXPENSE AS RELATED TO TYPE OF POWER AND VOLUME GINNED

## OKLAHOMA COOPERATIVE COTTON-GIN ASSOCIATIONS, 1933-34



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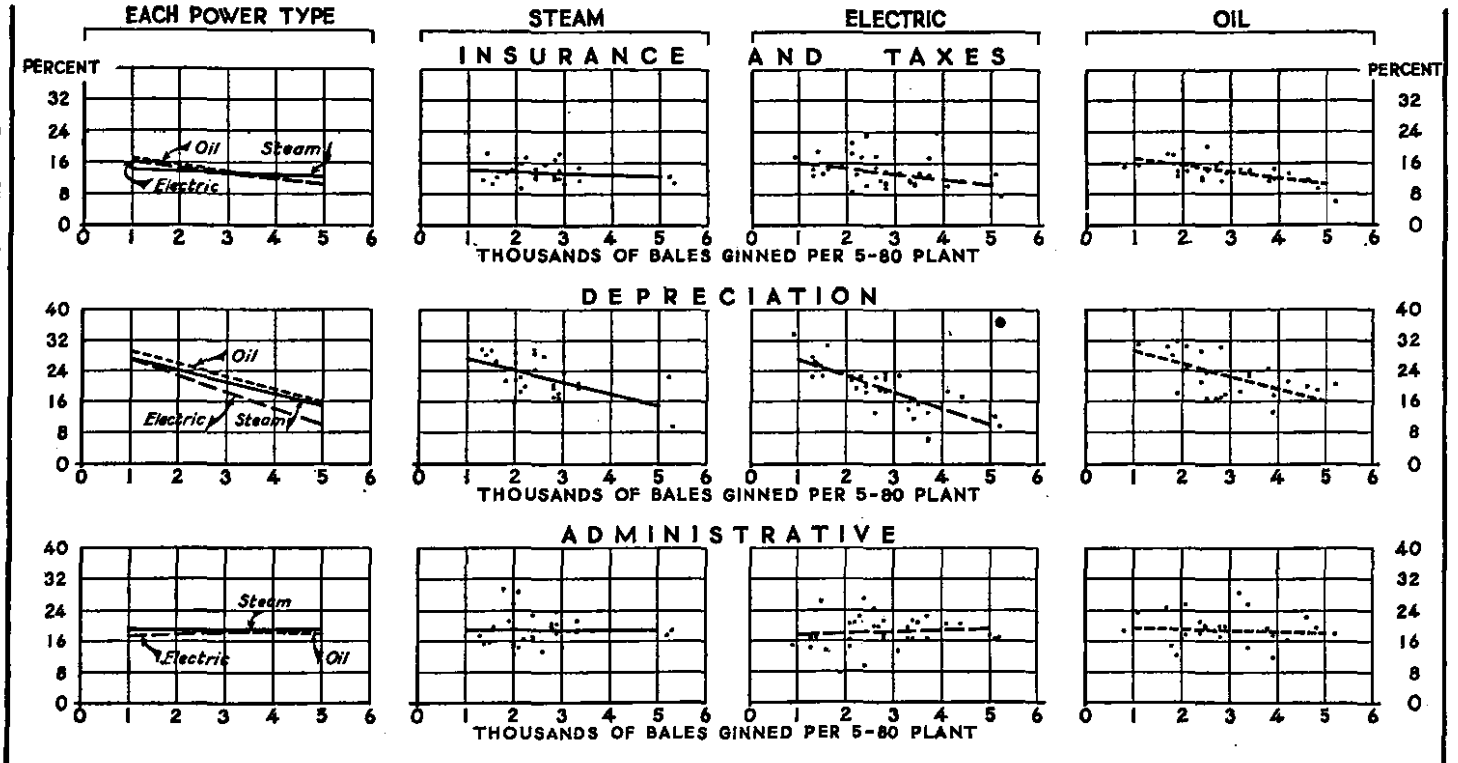



FIGURE 11.—Labor is an important item of expense for plants of all power types, and becomes increasingly important as volume increases. Except for electric plants, fuel accounts for a relatively small percentage of total expense. Repairs and supplies tend to become more important with increased volume. Insurance and taxes, and particularly depreciation, decline relative to the total expense as volume increases. Administrative expenses make up approximately the same percentage of the total expenses regardless of the volume ginned.

percentage of the total expense (table 18, fig. 11). The straight lines shown in this figure are the lines of average relationship between volume ginned (per 5–80 equivalent) and the percentage each item of expense is of the total expense.[8] For example, with steam plants at a volume of 1,000 bales, labor expense made up approximately 17 cents of each dollar of total expense; and at a volume of 5,000 bales, 32 cents of each dollar (see upper left-hand section of fig. 11).

By reading down each of the first three columns of the chart a comparison may be made of the relative importance of the different expense items for the three types of power at different volumes; by reading from left to right, a comparison of each item of expense as influenced by power and volume. The right-hand column of this chart brings these factors together for ready comparison. Specific comparisons may be made between different items of expense for the same power type and between different power types for the same item of expense for the range of volume or any specified volume represented.

Regardless of the type of power, gin labor was one of the largest items of expense; and made up an increasing proportion of the average total expense at higher volumes. It was relatively less important for electric than for steam or oil plants.

Fuel and lubrication made up a smaller proportion of the average total expense of steam and oil plants than current and lubrication for electric plants, at all volumes represented. The combined cost of current and lubricating oil for electric plants amounted to approximately the same as labor, and increased with additional volume at about the same rate. For oil and steam plants, however, fuel and lubrication made up a relatively small proportion of the total expense and this relationship tended to remain about the same regardless of volume ginned.

Average expenses for repairs, supplies, and miscellaneous items, in relation to the total expenses, varied considerably in different plants. They ranged from 10 to 20 cents per dollar of total expense (fig. 11), and tended to become a relatively large percentage of the total expenses at successively higher volumes. These items of expense are of less importance with electric than with steam or oil plants.

Since insurance and taxes were about the same in amount regardless of volume, these items of expense became relatively less important at higher volumes. The line of average relationship (fig. 11) does not decline as rapidly for steam plants as for oil and electric plants, because the larger pay roll of steam plants, with increased volume, caused the amount expended in compensation insurance to increase.

Compared with other items, depreciation was one of the major items of expense and especially so when only a small volume was

[8] The straight line formula, $y=a+bx$, was used in determining the points for these lines.

ginned. As a result of the method used in calculating depreciation, this item made up a smaller proportion of the total expenses at higher volumes.

Administrative expenses made up nearly 20 cents of each dollar of total expense. This group of expenses was not materially influenced by either power type or volume.

### *Percentage of Snapped Cotton Ginned*

The Oklahoma ginning rates, as set by the State corporation commission, have been consistently higher for "snaps" than for picked cotton. Prior to 1927 the ginning rate for snaps per 100 pounds was approximately 50 percent higher than the rate for picked cotton; during the 1933–34 season the ginning rate at 22½ cents for snaps was 12.5 percent higher than the 20-cent rate for picked cotton. Under practical conditions how much more, if any, does it cost to gin 100 pounds of snaps than 100 pounds of picked cotton?

The number of bales of cotton produced in a given area would tend to be the same regardless of whether the cotton were harvested by picking or snapping. If any difference at all existed, more bales would be harvested by snapping than by picking, since it is frequently possible to snap cotton that cannot be picked. For snapped cotton, however, in which the percentage of waste, burrs, and trash, is larger, the volume of seed cotton required to turn out a bale of a given size will be much greater. According to a report of the Oklahoma Agricultural Experiment Station,[9] based on more than 2,000 bales each of picked and snapped cotton, the pounds of seed cotton required to gin out a 478-pound-net-weight bale was 30.7 percent greater for snapped than for picked cotton. This means that the volume of seed cotton to be ginned is practically one-third more if all the cotton is harvested by snapping rather than picking. Obviously, this would mean an increase of one-third in total revenue from ginning toll, even though the rate for snaps was the same as for picked cotton.

The 95 gin associations studied were divided into two groups, on the basis of the percentage of snaps ginned (table 19). There were 54 associations which ginned 51 percent or more of snaps and 41 associations which ginned 50 percent or less of snaps. The indicated average total expense per 100 pounds of seed cotton was then determined for each group, at 500-bale intervals from 1,000 to 5,500 bales, by the same method used in comparing size groups and power groups. By using bales ginned per 5–80 equivalent (400 saws) as the unit of volume, instead of actual bales ginned, allowances were made for the effect of size of plant. Effects of power type and other variables

[9] McWhorter, Clyde C. CURRENT FARM ECONOMICS, 8 (3). 1935. (Pub. Okla. Agr. & Mech. College).

were compensating to the extent that the different power types were equally distributed between these two groupings (table 19, fig. 12).

TABLE 19.—INDICATED AVERAGE TOTAL GINNING EXPENSE PER 100 POUNDS OF SEED COTTON AT SPECIFIED VOLUMES FOR ASSOCIATIONS GINNING 50 PERCENT OR LESS SNAPS AND THOSE GINNING 51 PERCENT OR MORE SNAPS

| Bales ginned [1] | Average total ginning expense per 100 pounds of seed cotton for plants ginning— | | Bales ginned [1] | Average total ginning expense per 100 pounds of seed cotton for plants ginning— | |
|---|---|---|---|---|---|
| | 50 percent or less snaps | 51 percent or more snaps | | 50 percent or less snaps | 51 percent or more snaps |
| | *Cents* | *Cents* | | *Cents* | *Cents* |
| 1,000 | 40.6 | 37.0 | 3,500 | 17.5 | 17.6 |
| 1,500 | 29.8 | 27.9 | 4,000 | 16.4 | 16.7 |
| 2,000 | 24.5 | 23.4 | 4,500 | 15.5 | 15.9 |
| 2,500 | 21.2 | 20.7 | 5,000 | 14.8 | 15.3 |
| 3,000 | 19.1 | 18.9 | 5,500 | 14.2 | 14.8 |

[1] 5-80 equivalent plants.

As shown by the averages in table 19, until a volume of more than 3,000 bales was obtained, the total expenses per 100 pounds of seed cotton for plants ginning less than 50 percent snaps was actually more than for plants ginning 51 percent or more snaps. At volumes greater than 4,000 bales the plants ginning the smaller proportion of snaps had slightly lower expenses per 100 pounds of seed cotton.

These differences are explained by the influence of volume on per unit expenses. Generally, cotton gins are not able to operate at 100 percent capacity during a greater part of the ginning season, for the reason that cotton to be ginned is not continuously available. During the days of slow or intermittent ginning, however, practically all of the expenses are nearly as great as when the plants are operating at capacity. The additional volume furnished by the burrs and trash in snapped cotton can be handled at little actual additional cost over ginning the same number of bales of picked cotton. This tends to reduce the cost per 100 pounds of seed cotton ginned because more pounds are handled. This is especially true when less than a 3,000-bale volume is ginned (fig. 12). If the number of gin plants in a given area were based on the number required, operating 24 hours a day, to handle all the cotton in the peak season, there would not be sufficient volume to keep all these plants in continuous operation, even for 12 hours a day, at the beginning and at the end of the season. The amount of snapped cotton which the gins handle in some areas during the latter part of the ginning season considerably reduces the expenses per 100 pounds of seed cotton. The per bale expenses, however, would be higher for snapped than for picked cotton.

It may be contended that gin machinery depreciates faster when ginning snapped cotton than when ginning picked cotton and that a greater investment in cleaning machinery and power equipment is required to gin snaps. To some extent this is true. For those areas, however, where the practice of snapping is most prevalent, there is a considerable amount of sand and trash even in the most carefully picked cotton; and the difference in wear on the machinery as between ginning picked and snapped cotton from the same field is not so large as might be expected. With regard to the greater investment in cleaning machinery and the amount of power required to gin snaps, the gins must have this machinery even if only a small portion of the cotton is snapped; and once it is had, a certain amount of depreciation and obsolescence goes on whether or not the machinery is used continuously.

If it is assumed that the number of gins available in two areas is in proportion to the amount of seed cotton to be ginned in each area, the relative costs of ginning where the cotton is picked free from sand

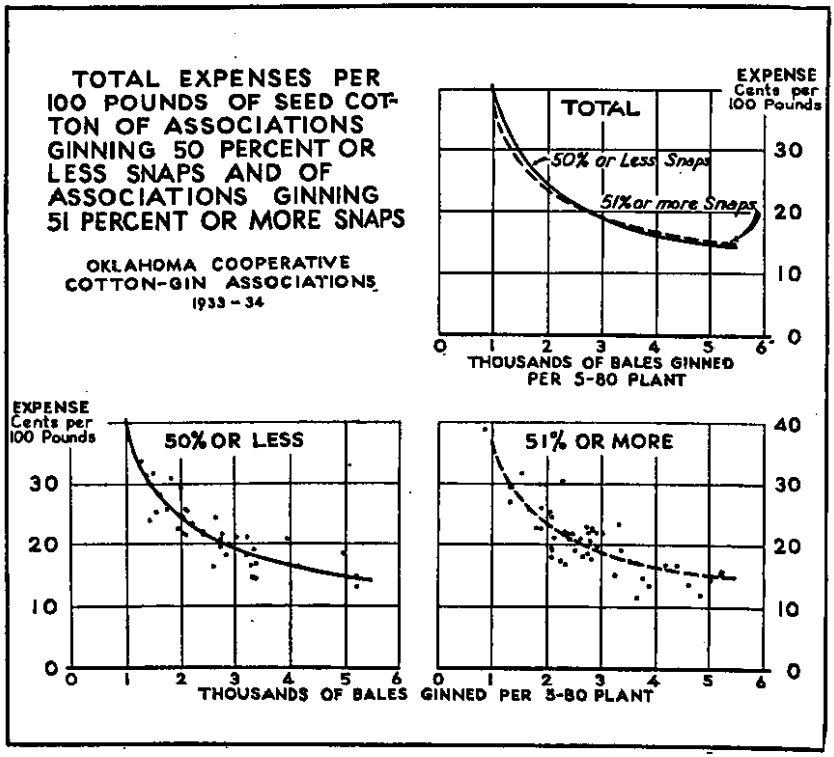



FIGURE 12.—Ginning expenses per 100 pounds of seed cotton were practically the same for plants that ginned 51 percent or more snaps as for plants that ginned 50 percent or less snaps.

and burrs, and where the cotton is snapped, would likely show a lower ginning cost per 100 pounds for the area where picking was practiced. The difference in ginning expenses would result from different conditions in the two areas rather than from different methods of harvesting cotton in an area handling both picked and snapped cotton.

The effect of snapping cotton on the quality of ginned lint is still another question entirely separate from ginning expenses and is not considered in this analysis. If it does not cost more per 100 pounds to gin snapped cotton than it does to gin picked cotton, the rate for ginning should be the same. If we assume that the expense is the same per 100 pounds for snapped and picked cotton, the total net income to the gin would be more for the snaps at the same number of bales ginned even if the same rate is charged for each, because more units of volume would be handled.

### *Percentage of Cotton Purchased*

The buying and selling of cotton by the gin organization tends to increase total overhead expenses. However, to the extent that services offered by cooperative gin associations in buying cotton increases volume ginned, the total per unit cost of ginning may be lowered.

The 95 associations were divided into three groups on the basis of the bales bought by each gin association, as a percentage of the bales ginned on its plant. The indicated average total expense per 100 pounds of seed cotton in relation to volume per 5–80 equivalent plant (400 saws) was determined for each of these groups at 500-bale intervals from 1,000 to 5,500 bales (table 20, fig. 13).

TABLE 20.—INDICATED AVERAGE TOTAL EXPENSE OF GINNING 100 POUNDS OF SEED COTTON FOR ASSOCIATIONS PURCHASING SPECIFIED PERCENTAGES OF THE COTTON GINNED ON THEIR PLANTS, BY TOTAL VOLUME GINNED

| Bales ginned [1] | Expense per 100 pounds of seed cotton of associations buying indicated percentage of cotton ginned | | | Bales ginned [1] | Expense per 100 pounds of seed cotton of associations buying indicated percentage of cotton ginned | | |
|---|---|---|---|---|---|---|---|
| | 33.3 percent or less | 33.4 to 66.6 percent | 66.7 percent or more | | 33.3 percent or less | 33.4 to 66.6 percent | 66.7 percent or more |
| | *Cents* | *Cents* | *Cents* | | *Cents* | *Cents* | *Cents* |
| 1,000 | 36.2 | 42.5 | 39.2 | 3,500 | 17.4 | 17.8 | 17.4 |
| 1,500 | 27.4 | 31.0 | 29.0 | 4,000 | 16.5 | 16.6 | 16.3 |
| 2,000 | 23.1 | 25.2 | 23.9 | 4,500 | 15.8 | 15.6 | 15.4 |
| 2,500 | 20.4 | 21.8 | 20.9 | 5,000 | 15.2 | 14.9 | 14.7 |
| 3,000 | 18.7 | 19.5 | 18.8 | 5,500 | 14.7 | 14.2 | 14.2 |

[1] Per 5–80 equivalent plant.

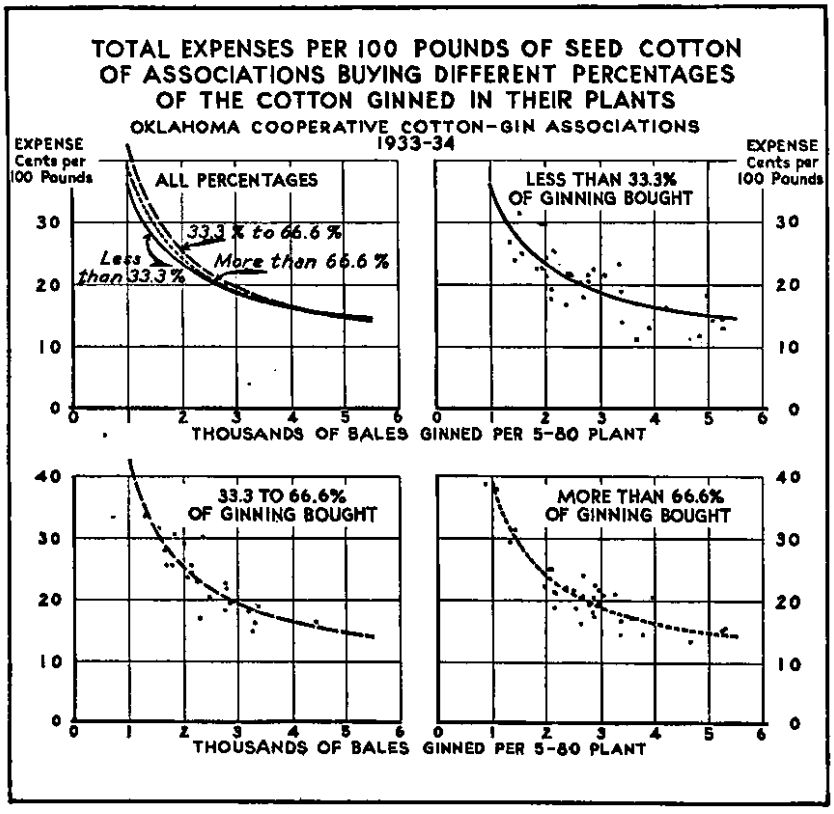



FIGURE 13.—Associations that bought from one-third to two-thirds of the cotton ginned on their plants had higher expenses than associations that bought either a smaller or a larger proportion.

Although differences in the total ginning expenses of associations that bought different percentages of the cotton ginned are not wide enough to be absolutely conclusive, they indicate that cotton-buying operations and the reasons prompting associations to buy cotton do influence ginning expenses, especially when the volume ginned is less than 3,500 bales per 5–80 plant.

Associations which bought less than a third of their ginnings, in many cases only a few bales, were not actively and aggressively engaged in buying cotton. They offered no price incentive or special service to attract cotton purchases or to obtain additional ginning business. Many confined their purchases largely to remnants of seed cotton, a few bales that were damaged in ginning, or an occasional bale as an immediate accommodation to some customer.

On the other hand, those buying more than two-thirds of the cotton ginned were probably offering cotton-buying service primarily to accommodate patrons by supplying a convenient market for cotton

rather than engaging aggressively in the cotton business. Associations, particularly isolated rural plants, for which the competitive element is not present, buy the greater proportion of the cotton ginned in their plants because no other local market exists for their patrons. Under such conditions, gin associations try to break even or realize a small profit on this activity. As is evident from the fact that these associations bought most of the cotton ginned, they were not forced by effective competition of other agencies to offer additional services as a means of securing more ginning volume or to realize a profit on cotton transactions, and thereby to increase their expenses. The expense per 100 pounds of seed cotton ginned, for this group, because of the volume of cotton handled, was slightly more than for the group buying only a small proportion of the cotton ginned, but was less for the group buying from one-third to two-thirds of their ginnings.

This higher average expense of associations buying from one-third to two-thirds is perhaps due to the fact that they were actively competing for the cotton-merchandising business either to make a profit on the cotton or to reduce the per unit ginning expense by increasing volume, as evidenced by the fact that a considerable amount of cotton was bought. Generally, the profit motive on merchandising cotton is perhaps the incentive of least importance. On the other hand, since less than two-thirds of their volume ginned was bought, it is evident that other agencies were also competing for the cotton-merchandising business. Under such conditions associations competing with commercial gins offering such a service, buy a large percentage of the cotton ginned as a means of holding their membership and attracting new members and patrons. It is reasonable to assume that certain additional services such as drayage, storage, and insurance on cotton would also be furnished to the patrons, and also that certain administrative expenses as advertising, telegraph and telephone, and manager's expense would be increased.

For all three groups, at volumes in excess of 3,500 bales, an additional expense incurred in cotton-buying operations would be relatively small as compared to total expenses. With a volume of 3,500 bales or more, the net income realized from ginning, wrapping, and cottonseed sold is enough so that direct or indirect profits on cotton-buying operations may become secondary to accommodating customers, regardless of the amount of cotton bought.

### *Experience, Training, and Education of the Gin Manager*

An attempt was made to obtain information from each association regarding the qualifications of the manager. Information relating to the nature of previous experience and training, number of years employed, and education was obtained with respect to the managers of most of the associations studied.

It is realized that the personal qualifications of an individual cannot be definitely attributed to any factor, or expressed numerically. The efficiency of gin managers cannot be conclusively measured by their education, training, or experience, nor even by personal ability. Numerous conditions beyond the control of the manager, such as location, condition, and age of the physical gin plant, all combine to produce differences in the expenditures of associations. Moreover, low ginning expenses do not necessarily mean a high total income from all activities combined. For example, a gin manager may devote most of his time and effort to keeping down the expenses of the gin plant and neglect the handling of cottonseed, cotton, and side lines. Although differences in ginning expenses as influenced by factors of management were not definite enough to be conclusive, some general tendencies were indicated by comparisons made between expenses of associations grouped according to certain measures of the manager's ability.

As to the previous experience desirable for a manager, there are two rather distinct schools of thought on the part of the board members. In perhaps a majority of cases the board prefers a man who is well trained in the mechanical operation of the gin machinery. One of the arguments for this theory is that the manager can make the repairs during the idle season as well as keep the mechanical plant in good condition during the busy season. Other boards of directors believe that familiarity with the business aspects of the operation of a gin is the better background for development into a successful manager. A comparison of per unit expenses on the basis of the previous training of the managers, however, reveals no material difference. Managers with a mechanical background were apparently unable to operate their gin plants, on the average, any more economically than managers having a clerical background.

Neither did the number of years' experience of the manager appear to affect per unit expense. Associations that employed the same manager year after year did not necessarily operate their plants any more economically than associations changing managers every 2 or 3 years. It is entirely probable that a manager, in order to make a good impression, would be more careful in keeping down expenses during his first few years as manager than he would be after he had been employed several years and had begun to feel more secure in his position. Such a policy on the part of a new manager, if practiced, may even increase expenses over a period of several years. For example, if expenses of the current year are kept down by postponing needed repairs, the cost of such items may actually be increased during the next few years.

The education of the gin manager, however, did appear to have a slight effect on the per unit ginning expense. On the average, the

per unit expenses of associations whose manager had only a common school education were somewhat higher than the expenses of associations whose managers had some high school or college training. This difference in expenses was particularly noticeable in cases where the volume ginned was relatively low.

### *Percentage of Volume Ginned in Most Active Calendar Month*

Regardless of the total volume, the greater the percentage of the season's ginnings done in one calendar month, the lower the per unit expense (table 21, fig. 14). Although not shown by these data this was true for these plants regardless of the number of days operated during the 1933–34 season. Ginnings by calendar months were obtained in the survey for each of the 95 associations. More cotton was ginned by each association during October, than during any other calendar month.

TABLE 21.—INDICATED AVERAGE TOTAL EXPENSE OF GINNING 100 POUNDS OF SEED COTTON FOR ASSOCIATIONS GINNING SPECIFIED PERCENTAGES OF THEIR TOTAL VOLUME DURING 1 MONTH, BY VOLUME GINNED

| Bales ginned [1] | Average ginning expenses for associations ginning specified percentages of total volume in 1 month | | Bales ginned [1] | Average ginning expenses for associations ginning specified percentages of total volume in 1 month | |
|---|---|---|---|---|---|
| | 50 percent or less | 51 percent or more | | 50 percent or less | 51 percent or more |
| | *Cents* | *Cents* | | *Cents* | *Cents* |
| 1,000 | 39.5 | 36.6 | 3,500 | 18.2 | 17.2 |
| 1,500 | 29.5 | 27.5 | 4,000 | 17.1 | 16.2 |
| 2,000 | 24.6 | 23.0 | 4,500 | 16.3 | 15.5 |
| 2,500 | 21.6 | 20.3 | 5,000 | 15.6 | 14.9 |
| 3,000 | 19.6 | 18.5 | | | |

[1] Per 5-80 equivalent plant.

The associations were divided into two groups, those ginning 50 percent or more of their total volume in October and those ginning less than 50 percent during that month. On the average, associations ginning 50 percent or more of their total volume in October operated at a lower expense per 100 pounds of seed cotton. Differences became less pronounced as comparisons were made between plants with successively higher volumes. As the volume ginned per season approached the maximum capacity of the plant, concentrated volume became less desirable.

At a 1,000-bale volume, the group of associations ginning more than half of their season's volume in October operated at 2.9 cents less per 100 pounds of seed cotton than those ginning less than half their season's volume during that month. This would amount to about 43 cents per bale of 1,500 pounds of seed cotton, and 58 cents per bale

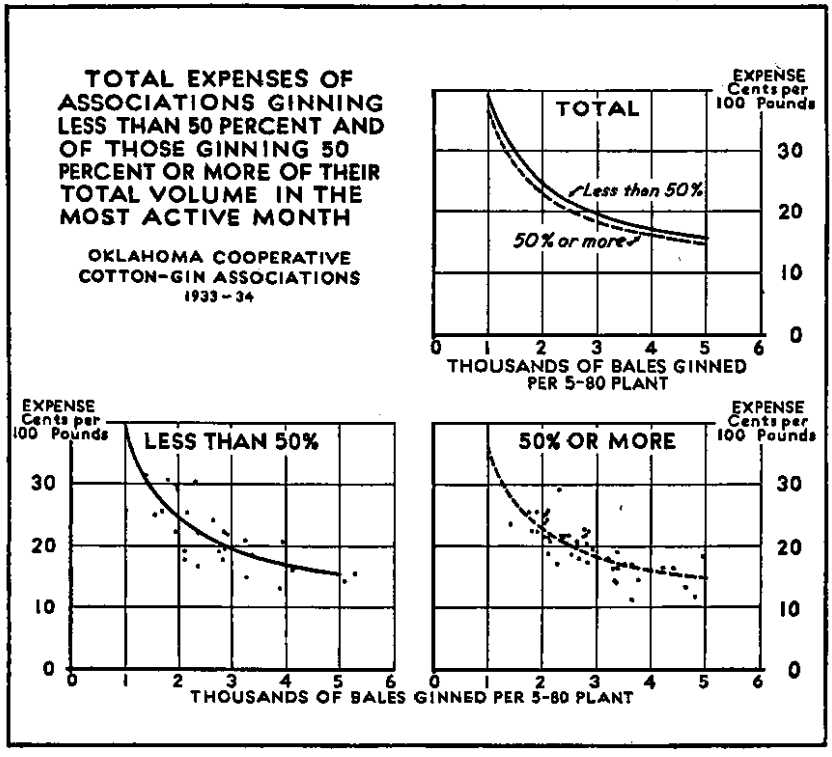



FIGURE 14.—The expenses were lower for the associations having the most concentrated volume.

of 2,000 pounds. At a 3,500-bale volume the difference would range from 15 to 20 cents per bale (1 cent per 100 pounds of seed cotton) in favor of the plants with the more concentrated volume. At 5,000 bales the difference would range between 10 and 15 cents per bale.

### *Days Plant Was Operated During Season*

When the volume ginned was above 2,100 bales per season the expenses per 100 pounds of seed cotton were definitely higher for plants operating less than 100 days than for plants operating more than 100 days. At volumes below 2,100 bales, plants operating the fewest number of days had the lowest expense per 100 pounds of seed cotton (table 22 and fig. 15).

At a 1,000-bale volume, the average expenses of plants that operated 100 days or less was 4.3 cents per 100 pounds of seed cotton below that of plants that ginned the same volume in more than 100 days. This would amount to 65 to 85 cents per bale. At a 5,000-bale volume, however, the plants that operated more than 100 days had an advantage of 2.1 cents per 100 pounds of seed cotton, or 30 to 40 cents per bale.

The explanation for these opposite differences in expenses with changes in the volume ginned is due to the relationship of per unit expenses and volume. As previously mentioned in other comparisons, ginning expenses per unit of volume tend to be lower when the plant is operated at normal rather than at nearly maximum capacity. In attempting to crowd the greatest possible volume through a gin plant within a given time, expenses such as labor, power, and repairs increase faster than the volume ginned.

If capacity ginning means fast ginning, then the quality of ginned lint may be lowered.[10] It is a short-sighted policy for a cooperative gin association to follow ginning practices that tend to lower the quality of ginned lint in order to gin more cotton or to get a higher net income for the association. The final net returns to members on the cotton which they produce, after deducting the expenses of ginning as well as all other expenses of producing the cotton, should be considered rather than ginning expenses only.

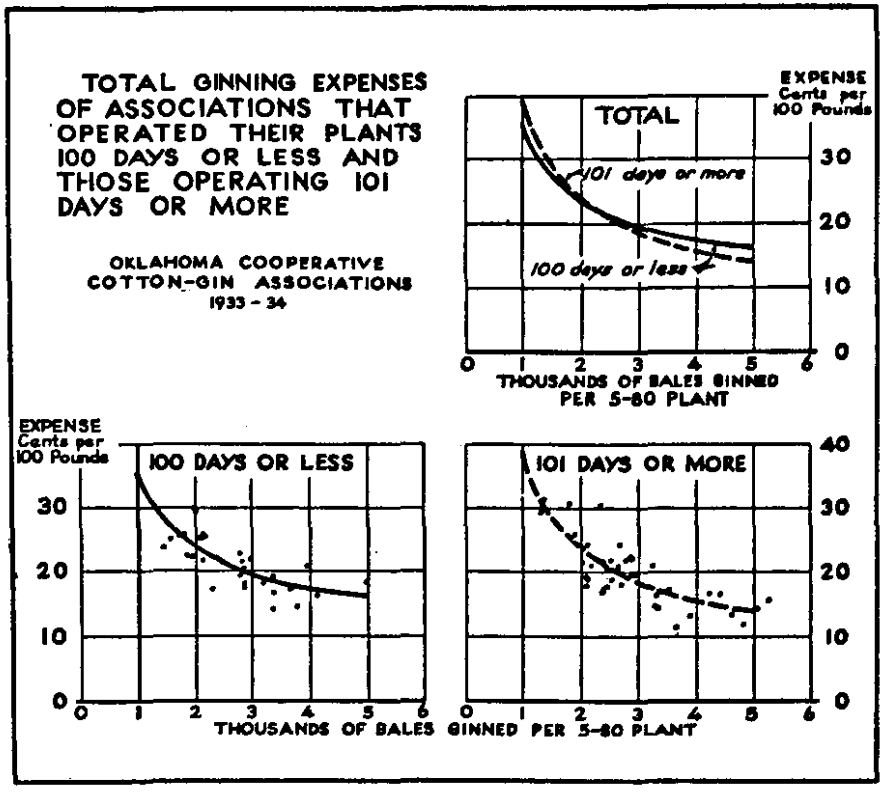



FIGURE 15.—Expenses were higher for plants that operated 100 days or less than for plants that operated 101 days or more, when the season's volume was more than 2,000 bales per 5–80 plant.

[10] See Bennett, Charles A., and Gerdes, F. L. GINNING COTTON, U. S. Dept. Agr. Farmers Bull. 1748, 46 pp., illus., 1936.

TABLE 22.—INDICATED AVERAGE TOTAL EXPENSE OF GINNING 100 POUNDS OF SEED COTTON FOR PLANTS OPERATING 100 DAYS OR LESS, AND FOR PLANTS OPERATING 101 DAYS OR MORE, BY VOLUME GINNED

| Bales ginned [1] | Average total ginning expense for plants operating— | | Bales ginned [1] | Average total ginning expense for plants operating— | |
|---|---|---|---|---|---|
| | 100 days or less | 101 days or more | | 100 days or less | 101 days or more |
| | *Cents* | *Cents* | | *Cents* | *Cents* |
| 1,000 | 35.4 | 39.7 | 3,500 | 18.4 | 16.9 |
| 1,500 | 27.4 | 29.1 | 4,000 | 17.5 | 15.8 |
| 2,000 | 23.5 | 23.8 | 4,500 | 16.9 | 14.9 |
| 2,500 | 21.1 | 20.6 | 5,000 | 16.3 | 14.2 |
| 3,000 | 19.5 | 18.5 | | | |

[1] Per 5-80 equivalent plant.

# Income

## Sources of Income

COOPERATIVE cotton gins, like commercial gins, derive revenue from several sources other than ginning. A cotton gin virtually has a monopoly on the sale of bagging and ties to its customers, and in most cases practically a monopoly on the handling of a large portion of the cottonseed ginned. Some gins also buy cotton, but, as a rule, making a profit on this activity is not their aim. Some gin associations sell supplies such as feed, coal, gas, and oil; some handle farm machinery; and a few operate grain elevators. These side-line activities may be carried on under the same corporate charter as the ginning business; or they may be conducted under a separate corporate charter, but with the same board of directors and manager and even the same office.

Of the 95 associations studied, all were engaged in ginning cotton and handling bagging and ties. Other major sources of revenue and the number of associations receiving revenue from these activities are listed below:

| Sources of revenue: | *Associations receiving such revenue* |
|---|---|
| Ginning charges | 95 |
| Bagging and tie sales | 95 |
| Cottonseed sales | 94 |
| Bale-cotton sales | 89 |
| Other sales | 53 |
| Miscellaneous income | 47 |

All but one of the associations bought and sold cottonseed. The manager of this association handled the cottonseed business as part of his compensation. All but six of the associations handled some

cotton, although about a third bought less than 500 bales each. Fifty-three handled some feed, coal, farm supplies, oil, and gas, or grain; and forty-seven derived revenue from miscellaneous sources such as rents, interest, and similar items.

## Relative Importance of Income From Different Activities

Ginning tolls amounted to only 12.1 percent of the total gross sales for the 95 associations. An additional 3.1 percent was represented by the sale of bagging and ties (table 23). That is, only about 15 percent of the total gross revenue of these cotton ginning associations was derived from ginning and wrapping. Sales of bale cotton amounted to nearly two-thirds, 65.7 percent, of the total gross sales; sales of cottonseed, 14.1 percent. That is, sales of cotton and cottonseed made up almost 80 percent of the total sales of these 95 cooperative associations. It should be remembered, too, that only 73 percent of the cottonseed and 44.5 percent of the cotton ginned at these plants was bought by these associations from patrons.

TABLE 23.—RELATIVE IMPORTANCE OF DIFFERENT SOURCES OF INCOME ACCORDING TO GROSS SALES AND TOTAL NET INCOME, AND PERCENTAGE OF INCOME ON SALES, 1933–34

| Source of revenue | Percentage of gross sales derived from indicated source | Percentage of net income derived from indicated source | Net income as a percentage of gross sales |
|---|---|---|---|
| Ginning | 12.1 | 20.2 | 8.5 |
| Bagging and ties | 3.1 | 19.8 | 31.8 |
| Cottonseed | 14.1 | 47.2 | 16.9 |
| Cotton | 65.7 | 10.5 | .8 |
| Other sales and miscellaneous | 5.0 | 2.3 | 2.3 |
| Total or average | 100.0 | 100.0 | 5.0 |

As the price of cottonseed was abnormally low during the 1933–34 season, 14.1 percent probably would be too small a percentage of the total sales to show the relative importance of the cottonseed business to a gin association during seasons when prices of seed are more nearly normal or relatively high.

The net income on cottonseed made up almost one-half of the total net income; ginning, bagging and ties about 20 percent each; cotton purchases and sales, about 10 percent; and the purchase and sale of farm supplies and miscellaneous items, only 2.3 percent. The low price of cottonseed did not necessarily reduce the total income realized on that commodity, as the customary margin for gins handling cottonseed is somewhat constant regardless of the price of the seed. On

the average, ginning brought in about the same proportion of the total net income as bagging and ties. Fifty-nine of the 95 associations, however, had a larger income from bagging and ties than from ginning proper. Affecting this large percentage, however, is the fact that the ginning rate in 1933–34 was only 20 cents per 100 pounds of picked cotton and 22½ cents for snapped—the lowest rate ever established by the Corporation Commission of Oklahoma.

The percentage of income on all sales was 5.0 percent, or 5 cents for each dollar of sales. This return on total sales is low, primarily because of the small return of only 0.8 percent on cotton sales which made up almost two-thirds of the total gross sales. The return on ginning tolls was 8.4 percent; on bagging and ties, 31.8 percent; on cottonseed, 16.9 percent; and on side lines, 2.3 percent. The return on cottonseed sales is abnormally high in relation to the customary margin of income from this source because of the relatively low price prevailing during 1933–34. The returns on bagging and ties at 31.8 percent and ginning tolls at 8.4 percent are typical of the cotton ginning business—although, in view of the relative size of the investments required and the risks incurred in these two activities, the amount of the returns would seem fairer if they were reversed.

## Income From Each Activity per Unit Handled

### *Returns from Ginning Proper*

The 95 associations classified according to the amount of ginning income or loss realized per bale ginned are shown in table 24. The average volume is also shown for each group. As indicated by these figures, 45 of the associations failed to realize enough income to cover expenses [11] on ginning operations alone, while 14 associations lost

TABLE 24.—ASSOCIATIONS CLASSIFIED BY THE NET INCOME PER BALE FROM GINNING

| Ginning income [1] per bale | Number of associations | Average number of bales ginned | Ginning income [1] per bale | Number of associations | Average number of bales ginned |
|---|---|---|---|---|---|
| Below −$1 | 14 | 1,458 | $0.50 to $0.99 | 16 | 3,497 |
| −$1 to −$0.51 | 12 | 1,996 | $1 and above | 15 | 3,947 |
| −$0.50 to −$0.01 | 19 | 2,492 | | | |
| $0 to $0.49 | 19 | 2,834 | Total and averages | 95 | 2,744 |

[1] A minus sign indicates a loss.

more than $1 per bale. It should be remembered, however, that the ginning rates for the 1933–34 season were only 20 cents per 100 pounds for picked cotton and 22½ cents for snaps. Had the ginning rates

[11] Interest on borrowed capital and Federal income taxes are not considered as expenses of ginning, but rather as a distribution of income. Depreciation on buildings and machinery, however, is considered a part of the cost of operating the gin plant.

been the same as for the two previous seasons, that is, 25 and 30 cents for picked and snapped cotton respectively, and had the total volume and per unit expenses remained unchanged, only 12 of the associations would have failed to show a net income from ginning proper.

Each succeeding higher income-per-bale group is associated with an increased average volume ginned. No adjustments were made in these volume figures for differences because of size of plant.

### *Income From Bagging and Ties*

Each of the 95 associations sold practically the same number of patterns of bagging and ties as bales of cotton ginned, though some associations sold a few patterns to other gins. The price of a pattern of bagging and ties to the ginning patrons for the 1933–34 season, as set by the Oklahoma Corporation Commission, was $1 per pattern. On the basis of this price the 95 associations, as a group, made an average net income of 31.5 cents for each bale of cotton ginned. There was considerable variation in the average net income per pattern on bagging and ties between different associations. As shown by table 25, 69 of the associations made between 25 cents and 35 cents per pattern, 10 associations made 25 cents or less per pattern, and 16 associations more than 35 cents.

TABLE 25.—ASSOCIATIONS CLASSIFIED BY NET INCOME PER PATTERN ON BAGGING AND TIES

| Net income per pattern (cents) | Number of associations | Average number of patterns sold | Net income per pattern (cents) | Number of associations | Average number of patterns sold |
|---|---|---|---|---|---|
| 25.0 or less | 10 | 2,615 | 40.1 or more | 4 | 2,851 |
| 25.1 to 30 | 24 | 2,240 | | | |
| 30.1 to 35 | 45 | 3,082 | Total or average | 95 | 2,747 |
| 35.1 to 40 | 12 | 2,578 | | | |

### *Income From Cottonseed Purchased*

Although cooperative gin associations are primarily processing organizations in that ginning and baling cotton are initial functions, all but one of the 95 associations in Oklahoma handled cottonseed. The average net income from this source was $2.37 per ton. Only one association showed a loss on handling cottonseed. Thirty-five associations realized between $2 and $3 per ton, 33 made less than $2, and 26 more than $3 per ton (table 26).

The net income per ton, however, is not an accurate measure of the efficiency of a cooperative gin association in marketing cottonseed. In comparing two or more associations the initial prices paid the grower, as well as the associations' net incomes per ton, must be con-

sidered; as cooperative gins buy cottonseed from their patrons in much the same way as commercial gins—that is, the association buys the cottonseed outright.

In most localities it is the common practice for the local gin to pay its ginning customers $3 less per ton for cottonseed than the gin can obtain f. o. b. shipping point from the nearest cottonseed oil mill. Certain expenses of handling, such as loading, together with some shrinkage and waste that takes place, usually reduce this $3 margin to a net of about $2.50 per ton.

Although variations from this customary $3 gross margin are not uncommon, it is a normal amount from which the differential between wagon-lot prices at the gin, and car-lot or truck-lot prices at the nearby oil mill constantly fluctuate.

TABLE 26.—ASSOCIATIONS CLASSIFIED BY NET INCOME PER TON OF COTTONSEED HANDLED

| Net income [1] per ton | Number of associations | Average number of tons handled | Net income [1] per ton | Number of associations | Average number of tons handled |
|---|---|---|---|---|---|
| —$0.99 to $0 | 1 | 745 | $3.01 to $4 | 19 | 841 |
| $0.01 to $1 | 8 | 828 | $4.01 or more | 7 | 623 |
| $1.01 to $2 | 24 | 866 | | | |
| $2.01 to $3 | 35 | 998 | Total or average | 94 | 887 |

[1] A minus sign indicates a loss.

Any variation that is very much above or below this customary margin is due to either the selling or buying practices of the association. The per ton margin to the association may be increased by selling cottonseed to more distant mills at prices above the local price, by holding cottonseed on a rising market, by selling short on a falling market, or by paying patrons less than the customary local price based on the usual $3 differential. The per ton margin to the association is likewise decreased when the above practices are reversed.

The fact is that most cooperative gins make use of many of the practices common to commercial gins in efforts to increase their net income per ton on cottonseed handled. Except for isolated gins, the price paid the growers is usually a competitive price. Many of the gin managers keep constantly in touch with several more distant oil mills in an attempt to sell cottonseed at prices above those quoted by nearby mills. The managers of some associations frequently store and hold cottonseed in anticipation of a rising market. In other cases several cars of cottonseed are sold short in anticipation of a drop in prices.

As a general rule, however, because of the erratic fluctuations in the price paid for cottonseed by oil mills, the holding of any considerable amount of cottonseed for higher prices or selling short

creates a speculative risk that a cooperative is not in a position to assume. There appears to be a much greater opportunity for increased income on cottonseed if several local associations pool their sales on contract to certain mills, than if individual associations speculate on the future price of cottonseed. If a cottonseed oil mill could be assured a considerable volume of cottonseed from a rather large number of gins it could well afford to pay a higher price per ton for the same amount of cottonseed than is possible under the more costly methods of soliciting business in competition with other mills. The most logical long-time solution, however, to the problem of an outlet for cottonseed by cooperative cotton gins appears to be for a group of local gin associations to own and operate their own cottonseed-oil mill cooperatively. Owning and operating such a mill, however, requires a considerable amount of capital. Local gins, therefore, should consider the soundness of their own financial condition before attempting to finance a cottonseed oil mill.

### *Income per Bale of Cotton Purchased*

The purchase and sale of cotton, as previously mentioned, accounted for about 10 percent of the total net income of the 95 associations. There was wide variation both in the quantity of cotton bought by individual associations, and in the net income realized per bale (table 27). As mentioned in the discussion of expenses, none of the overhead charges such as manager's salary and office expenses were considered as a part of the cost of handling cotton. Only direct expenses such as drayage and yardage on cotton were so considered. Had a part of the overhead expenses been charged to cotton, the per bale returns shown in table 27 would have been somewhat less.

TABLE 27.—ASSOCIATIONS CLASSIFIED BY NET INCOME PER BALE ON COTTON BOUGHT

| Net income per bale of cotton sold [1] | Number of associations | Average number of bales handled | Net income per bale of cotton sold [1] | Number of associations | Average number of bales handled |
|---|---|---|---|---|---|
| —$1.01 or more | 8 | 293 | $1 to $1.49 | 4 | 1,624 |
| —$1 to —$0.51 | 8 | 787 | $1.50 to $1.99 | 4 | 221 |
| —$0.50 to —$0.01 | 15 | 1,994 | $2 or more | 8 | 943 |
| $0 to $0.49 | 29 | 1,456 | | | |
| $0.50 to $0.99 | 19 | 1,061 | Total and averages | 95 | 1,219 |

[1] A minus sign indicates a loss.

Only one-third of the associations lost money on cotton-buying operations in 1933–34 (table 27). For most of the associations that handled any appreciable amount of bale cotton the income or loss per bale was not large. A per bale income of less than 50 cents was realized by 29 associations, while 15 associations lost less than 50 cents per

bale. The income or loss of 71 associations was between $1 per bale loss and $1 per bale gain. Eight associations lost more than $1 per bale, while 16 made more than $1 per bale. For the most part, however, associations that lost or made more than $1 per bale did not buy many bales, and the total loss or gain therefore was not important.

### *Returns from Side-Line Activities*

In addition to cottonseed, bagging and ties, and cotton, most of the associations handled side lines such as coal, feed, seed, gas and oil, farm machinery, and miscellaneous farm supplies for their members. Several also purchased or handled miscellaneous commodities for their members, such as poultry, dairy products, or grain. Following is a classification of associations according to their total miscellaneous sales.

| Total sales of side lines: | *Number of associations* |
|---|---|
| None | 30 |
| $0.01 to $100 | 9 |
| $100.01 to $500 | 20 |
| $500.01 to $1,000 | 11 |
| $1,000.01 to $2,500 | 15 |
| $2,500.01 to $5,000 | 4 |
| $5,000.01 to $50,000 | 3 |
| $50,000.01 or more | [12] 3 |

[12] These associations operated grain elevators.

Generally the net income from such activities was small, and in many cases the side lines were handled at a loss. As a rule, the objective in handling side lines was to accommodate members and other farmers, rather than to realize a net income to the cooperative. For 59 of these associations, business in miscellaneous side lines amounted to less than $500 each. Only six associations handled more than $5,000 worth of side lines each while three associations handled more than $50,000 each, and three associations handled more than $50,000 each

## Income per 100 pounds of Seed Cotton Ginned as Affected by Sources of Income and Volume Ginned

There is a direct relationship between ginning income and volume ginned. At any volume, ginning income is supplemented by the addition of the income realized from the handling of bagging and ties, cottonseed, cotton, and side lines (table 28 and fig. 20). Since most of the activities of a cotton gin are interrelated, the income from each activity may be expressed logically in terms of the volume ginned, as well as in the units of each commodity handled.

The net income per 100 pounds of seed cotton, from ginning alone, was determined for each association. The income from each of the

other sources—bagging and ties, cottonseed, cotton, and side lines—was then added one by one to that of ginning. After each of these additions, the resulting income was expressed in cents per 100 pounds of seed cotton. Five different income figures were thus determined for each association. These figures show the amount by which the income from ginning is increased by successively adding the income derived from these other sources that are so closely related to the ginning business.

TABLE 28.—INDICATED AVERAGE INCOME FROM GINNING 100 POUNDS OF SEED COTTON AT SPECIFIED VOLUMES AS AFFECTED BY SUCCESSIVE ADDITIONS FROM ACTIVITIES OTHER THAN GINNING

| Bales ginned [1] | Income [2] per 100 pounds of seed cotton ginned from— | | | | |
|---|---|---|---|---|---|
| | Ginning only | Ginning and wrapping | Ginning, wrapping, and cottonseed | Ginning, wrapping, cottonseed, and cotton | Ginning, wrapping, cottonseed, cotton, and side lines |
| | *Cents* | *Cents* | *Cents* | *Cents* | *Cents* |
| 1,000 | −17.8 | −16.2 | −11.4 | −10.8 | −8.9 |
| 1,500 | −7.6 | −5.9 | −1.8 | −.6 | .3 |
| 2,000 | −2.5 | −.7 | 3.5 | 4.5 | 4.9 |
| 2,500 | .6 | 2.4 | 6.5 | 7.5 | 7.7 |
| 3,000 | 2.6 | 4.4 | 8.5 | 9.6 | 9.6 |
| 3,500 | 4.1 | 6.0 | 9.9 | 11.0 | 10.9 |
| 4,000 | 5.2 | 7.1 | 11.0 | 12.1 | 11.9 |
| 4,500 | 6.0 | 7.9 | 11.8 | 13.0 | 12.7 |
| 5,000 | 6.7 | 8.6 | 12.4 | 13.6 | 13.3 |
| 5,500 | 7.3 | 9.2 | 13.0 | 14.2 | 13.8 |

[1] Per 5-80 equivalent plant.
[2] A minus sign indicates a loss.

The relationship between income from ginning alone in cents per 100 pounds of seed cotton, and volume in running bales per 5-80 equivalent plant, was then determined for all 95 associations. Likewise, the relationship between income and volume was determined after adding to ginning income the income from each of the other activities. Five lines of average relationship (fig. 16) between income and volume, as well as five series of averages (table 28) representing the income at 500-bale intervals in volume, were thus obtained.[13]

At a 1,000-bale volume per 5-80 equivalent plant, the average loss from ginning operations alone was 17.8 cents per 100 pounds of seed cotton ginned. The inclusion of the income from bagging and ties reduced this loss to 16.2 cents per 100 pounds of seed cotton; the addition of income from cottonseed further reduced it to a loss of 11.4 cents. Adding the average income from cotton further reduced the loss to 10.8 cents; and including the income from side lines brought the loss to 8.9 cents per 100 pounds of seed cotton. At a 1,000 bale volume,

[13] The same formula used in relating expenses to volume $\left(y=a+b\frac{1}{x}\right)$ was used in calculating the lines of average relationship and the resulting averages.

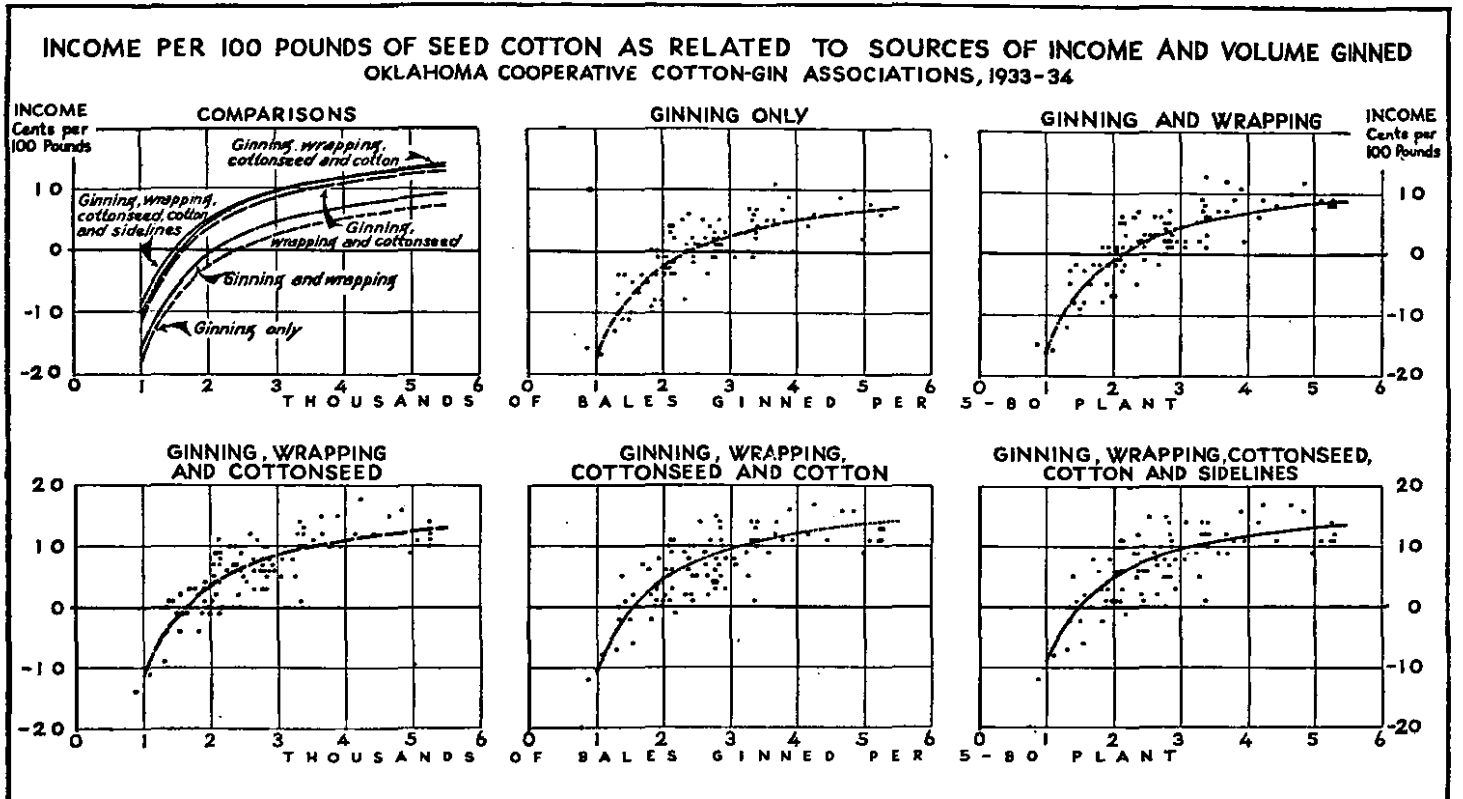



FIGURE 16.—The income from ginning increases with the volume ginned, and is materially supplemented by the income from bagging and ties, cottonseed, and other activities.

therefore, the net operating loss per 100 pounds of seed cotton was only half as great when the income from all other activities was deducted from the loss on ginning. Similarly, the average income from all activities per 100 pounds of seed cotton, at a 5,000-bale volume, was twice as much as the average income from ginning alone at that volume.

The combined average income per 100 pounds of seed cotton from ginning, wrapping, and cottonseed (table 28, column 4) is really the true ginning income, since these three activities are common to practically all gins, both commercial and cooperative. That is, a cotton gin is definitely assured of the sale of bagging and ties to an amount equal to the number of bales ginned, and practically assured of handling approximately three fourths of the cottonseed from the total bales ginned.

With a ginning rate of 20 cents per 100 pounds for picked cotton and 22½ cents for "snapped" cotton, the sale price on bagging and ties of $1 per pattern, and the prevailing net margin of $2.37 per ton on cottonseed, the average income from these three activities for the 95 associations varied from a loss of 11.4 cents per 100 pounds of seed cotton ginned at a volume of 1,000 bales to a net income of 13.0 cents per 100 pounds at 5,500 bales. As shown by figure 16, until a volume of nearly 1,600 bales per 5–80 plant was obtained, the net income realized from these three activities was less than the total ginning expenses.

The total income from all activities (fig. 16) increased with additional volume from a loss of 8.9 cents per 100 pounds of seed cotton, at 1,000 bales, to a gain of 13.8 cents at 5,500 bales. The rate of increase in income was less with each 500 bales additional volume. After a 5,000-bale volume per 5–80 plant was obtained, the increase in income with each additional 500-bale volume amounted to about one-half cent per 100 pounds of seed cotton, or approximately 10 cents per bale. That is, little additional income per unit is realized after obtaining a volume of more than 12½ bales per saw. The same tendency with reference to expenses was shown in the discussion of expenses.

## Other Factors Influencing Income

### *Percentage of Snapped Cotton Ginned*

The associations ginning the greatest proportion of snapped cotton had the highest income during the 1933–34 season (table 29 and fig. 17). At a volume of 1,000 bales the associations ginning 51 percent or more snaps lost 2.3 cents less per 100 pounds of seed cotton from ginning, wrapping, and cottonseed than did the associations ginning 50 percent or less snaps. At a volume of 5,500 bales associations handling the greater proportion of snapped cotton made 0.7 cents more

per 100 pounds of seed cotton. The income from ginning, wrapping, and cottonseed, since it is common to all associations, was used in table 29 rather than the total income from all activities.

TABLE 29.—INDICATED AVERAGE INCOME PER 100 POUNDS OF SEED COTTON FROM GINNING, WRAPPING, AND COTTONSEED FOR ASSOCIATIONS GINNING DIFFERENT PERCENTAGES OF SNAPS, BY VOLUME GINNED

| Bales ginned [1] | Average income [2] of plants ginning— | | Bales ginned [1] | Average income [2] of plants ginning— | |
|---|---|---|---|---|---|
| | 50 percent or less snaps | 51 percent or more snaps | | 50 percent or less snaps | 51 percent or more snaps |
| | *Cents* | *Cents* | | *Cents* | *Cents* |
| 1,000 | −12.1 | −9.8 | 3,500 | 9.3 | 10.2 |
| 1,500 | −2.1 | −.5 | 4,000 | 10.3 | 11.2 |
| 2,000 | 2.8 | 4.2 | 4,500 | 11.2 | 12.0 |
| 2,500 | 5.8 | 7.0 | 5,000 | 11.8 | 12.6 |
| 3,000 | 7.8 | 8.9 | 5,500 | 12.4 | 13.1 |

[1] Per 5-80 equivalent plant.
[2] A minus sign indicates a loss.

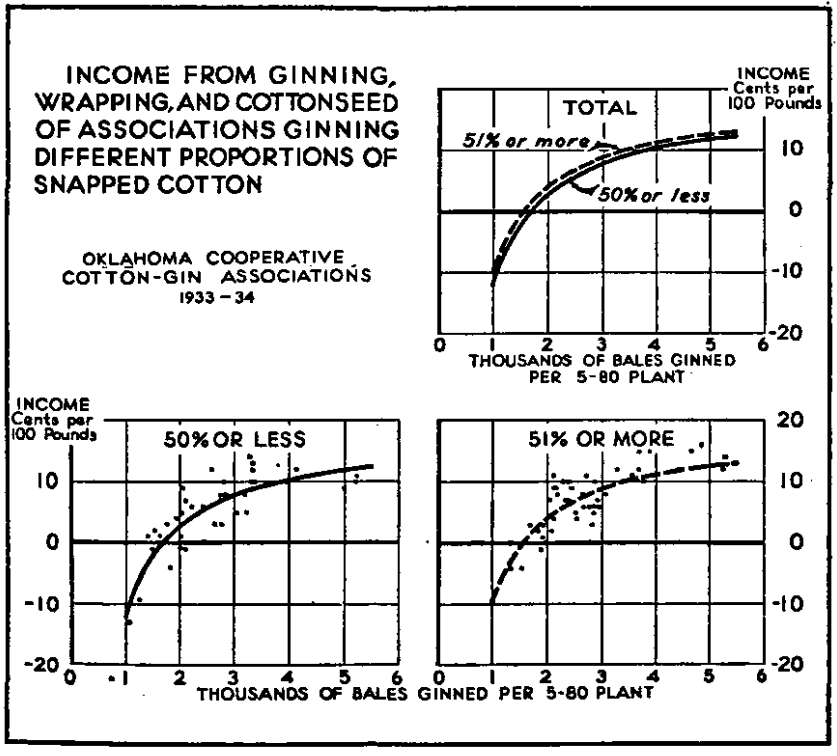



FIGURE 17.—The income per 100 pounds of seed cotton was slightly higher for associations ginning the higher percentages of snapped cotton.

The average ginning rate for the associations that ginned 51 percent or more of their cotton as snaps was 22.1 cents per 100 pounds, while the average rate of plants that ginned 50 percent or less snaps was 20.7 cents. The actual difference in the average ginning rate of the two groups of associations was 1.4 instead of 2.5 cents.[14] At 2,000 bales the higher income per 100 pounds of seed cotton of the associations ginning the greater portion of snaps as compared to those ginning a greater proportion of picked cotton, was partly due to the difference in the ginning rate. That is, at 2,000 bales or less, had the ginning rate been the same, ginning snaps would have been more profitable than ginning picked cotton.

Had the difference in ginning rates between snapped and picked cotton been greater than 2.5 cents, the advantage of plants ginning the greater proportion of snapped cotton would have been correspondingly larger. Had the ginning rate for picked and snapped cotton been the same, the net income from ginning, wrapping, and cottonseed would have been more for snapped cotton than for picked cotton at volumes less than 2,000 bales and nearly as much as for picked cotton at volumes in excess of 2,000 bales. Based on the data available there appears to be no justification for a higher ginning rate for snapped cotton than for picked cotton, at least in areas where both methods of harvesting are practiced.

### *Effect of Buying Cotton on Total Income*

*Percentage of ginned cotton bought.*—Cotton-buying operations may affect the total net income in several different ways. It is true that some associations gin more cotton than they otherwise would as a

TABLE 30.—INDICATED AVERAGE INCOME PER 100 POUNDS OF SEED COTTON FROM ALL ACTIVITIES FOR ASSOCIATIONS BUYING DIFFERENT PERCENTAGES OF THE COTTON GINNED AT THEIR PLANTS, BY TOTAL VOLUME GINNED

| Bales ginned [1] | Average income [2] per 100 pounds of seed cotton for associations buying indicated percentages of cotton ginned | | | Bales ginned [1] | Average income [2] per 100 pounds of seed cotton for associations buying indicated percentages of cotton ginned | | |
|---|---|---|---|---|---|---|---|
| | Less than 33.3 percent | 33.3 to 66.6 percent | 66.7 percent or more | | Less than 33.3 percent | 33.3 to 66.6 percent | 66.7 percent or more |
| | *Cents* | *Cents* | *Cents* | | *Cents* | *Cents* | *Cents* |
| 1,000 | −9.1 | −12.2 | −7.7 | 3,500 | 10.1 | 11.3 | 11.3 |
| 1,500 | −.2 | −1.3 | 1.4 | 4,000 | 11.1 | 12.5 | 12.5 |
| 2,000 | 4.3 | 4.2 | 6.6 | 4,500 | 11.8 | 13.4 | 13.6 |
| 2,500 | 7.0 | 7.5 | 8.7 | 5,000 | 12.4 | 14.1 | 14.2 |
| 3,000 | 8.8 | 9.7 | 10.5 | 5,500 | 12.9 | 14.7 | 14.7 |

[1] Per 5-80 equivalent plant.

[2] A minus sign indicates a loss.

[14] The ginning rate in Oklahoma in 1933-34 was 20 cents per 100 pounds of seed cotton for picked cotton and 22.5 cents for snaps or a difference of 2.5 cents per 100 pounds of seed cotton.

result of buying the patrons' cotton. The amount of cotton bought, however, is not as important a factor with respect to income as is the motive causing the association to buy cotton. The net effect of cotton-buying operations on income depends almost entirely on the purpose or objective which prompts the association to buy cotton.

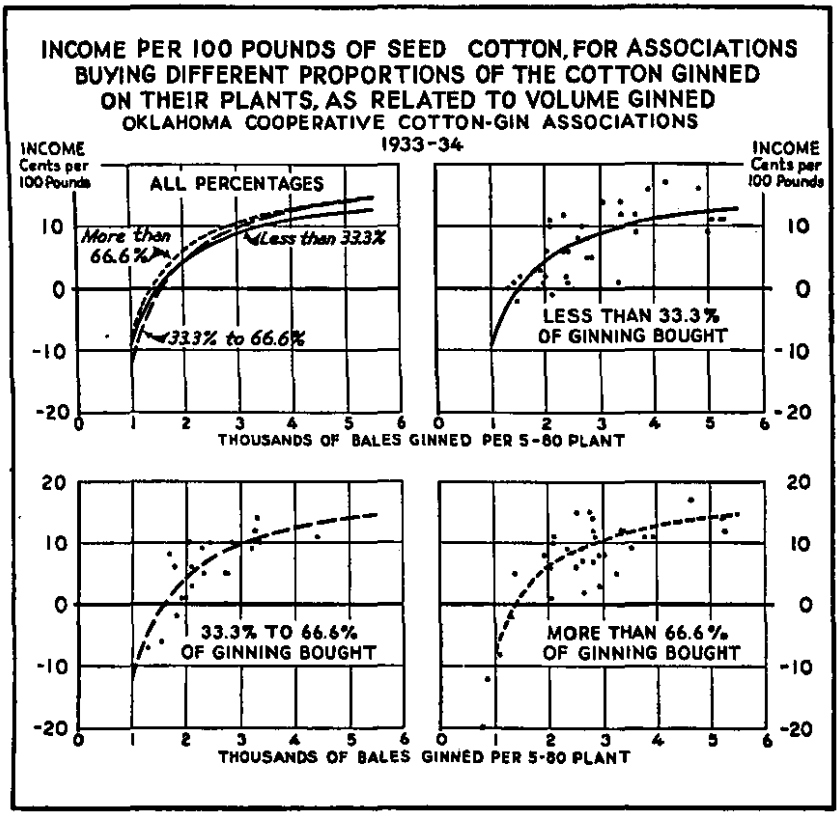



FIGURE 18.—The objective of an association in buying cotton, rather than the quantity bought, determines whether or not the total net income per unit is increased by purchasing cotton.

No satisfactory figures are available from the records of these associations to show what part of the volume of ginning obtained came as a result of cotton-buying operations. It is perhaps true, however, that some of the associations would not have been able to gin as much as they did without buying cotton. The only comparison that can be made is between groups of associations that bought different proportions of the cotton which they ginned (table 30 and fig. 18). Although the comparison is made between these groups at comparable volumes, the amount of cotton which many of the associations ginned was to some extent influenced by the amount of cotton bought.

On the average, associations that bought more than two-thirds of the cotton ginned on their plants had the highest total net income per 100 pounds of seed cotton ginned. Associations buying less than one-third, as compared to those buying more than two-thirds, had a lower net income per 100 pounds of seed cotton ginned at all volume ranges. There was a tendency for the difference between these two groups to become more pronounced as a greater number of bales was ginned. Perhaps this was due to the fact, previously mentioned, that those associations ginning only a small volume and buying most of it bought cotton either to attract or hold members and patrons. Under such conditions they were forced to pay more for the cotton bought than the other associations ginning a large volume and buying most of it; that is, associations with a relatively large volume of ginning would not be as likely to offer more than the market price for cotton in order to attract or hold members and patrons, because they were getting nearly as much cotton as they could gin without offering special price inducements.

The associations that bought from one-third to two-thirds of the cotton ginned on their plants, because of competition with other agencies, would tend to pay relatively more for cotton when faced with a small volume of ginning than those ginning more nearly their capacity. Associations within this group ginning less than 2,500 bales actually made a lower net income per 100 pounds of seed cotton than did other associations buying little or none of the cotton ginned on their plants. With more nearly a capacity volume, however, associations buying one-third to two-thirds of the cotton which they ginned were able to realize a higher net income than those that bought little or none of the cotton, and nearly as much as associations that bought practically all of the cotton which they ginned.

### *Effect of Buying Cottonseed on Total Income*

Since the income from cottonseed normally makes up such a large part of the total income of a cooperative cotton-gin association, the proportion of the total cottonseed ginned which is bought by the association materially affects the income per 100 pounds of seed cotton ginned. The average quantity of seed cotton sufficient for a bale of lint, as ginned by the 95 cooperative associations during 1933–34, contained approximately 895 pounds of cottonseed. At the average net income of $2.37 per ton on cottonseed handled, the buying of the cottonseed increased the income on bales so handled an average of $1.06. From the standpoint of total net income in dollars, a commercial gin is, of course, interested in buying the cottonseed from every bale ginned. A cooperative association, however, which separates the earnings on cottonseed from those of other activities, will

pay a smaller patronage dividend on cottonseed to those members who do not sell all of their cottonseed to the gin. Many cooperative gin associations, though, do not separate the income from cottonseed from that of other activities in determining the amount of patronage dividends due each member. In most cases the total net income from all activities available for distribution as patronage dividends is divided on the basis of volume ginned. The dividend basis most commonly used, and probably the most inequitable, is the number of running bales ginned.

TABLE 31.—INDICATED AVERAGE INCOME FROM GINNING, WRAPPING, AND COTTONSEED PER 100 POUNDS OF SEED COTTON FOR ASSOCIATIONS BUYING DIFFERENT PERCENTAGES OF COTTONSEED GINNED, BY TOTAL VOLUME GINNED

| Bales ginned [1] | Average income [2] of plants buying— | | Bales ginned [1] | Average income [2] of plants buying— | |
|---|---|---|---|---|---|
| | 69 percent or less of cottonseed ginned | 70 percent or more of cottonseed ginned | | 69 percent or less of cottonseed ginned | 70 percent or more of cottonseed ginned |
| | *Cents* | *Cents* | | *Cents* | *Cents* |
| 1,000 | −9.3 | −12.2 | 3,500 | 8.9 | 10.2 |
| 1,500 | −.8 | −1.8 | 4,000 | 9.9 | 11.3 |
| 2,000 | 3.5 | 3.5 | 4,500 | 10.6 | 12.2 |
| 2,500 | 6.0 | 6.6 | 5,000 | 11.1 | 12.8 |
| 3,000 | 7.7 | 8.7 | 5,500 | 11.6 | 13.4 |

[1] Per 5-80 equivalent plant.
[2] A minus sign indicates a loss.

In order to show the effect of the proportion of cottonseed bought on net income from ginning, wrapping, and cottonseed per 100 pounds of seed ginned, the associations were divided into two groups, based on the percentage of seed ginned which was bought by the associations (table 31 and fig. 19). The groupings, 70 percent or more, and 69 percent or less, were used because they divide the number of associations into two nearly equal groups.

The following differences exist in the average income per ton of cottonseed handled by associations buying 70 percent or more of the cottonseed ginned, and those buying 69 percent or less:

| Percentage of cottonseed bought and volume ginned: | *Average income per ton of cottonseed handled* |
|---|---|
| 69 percent or less of cottonseed bought: | |
| Less than 2,500 bales ginned | $2.79 |
| 2,500 or more bales ginned | 2.16 |
| 70 percent or more of cottonseed bought: | |
| Less than 2,500 bales ginned | 2.44 |
| 2,500 or more bales ginned | 2.29 |

Associations buying 70 percent or more had a higher income from ginning, wrapping, and cottonseed per 100 pounds of seed cotton

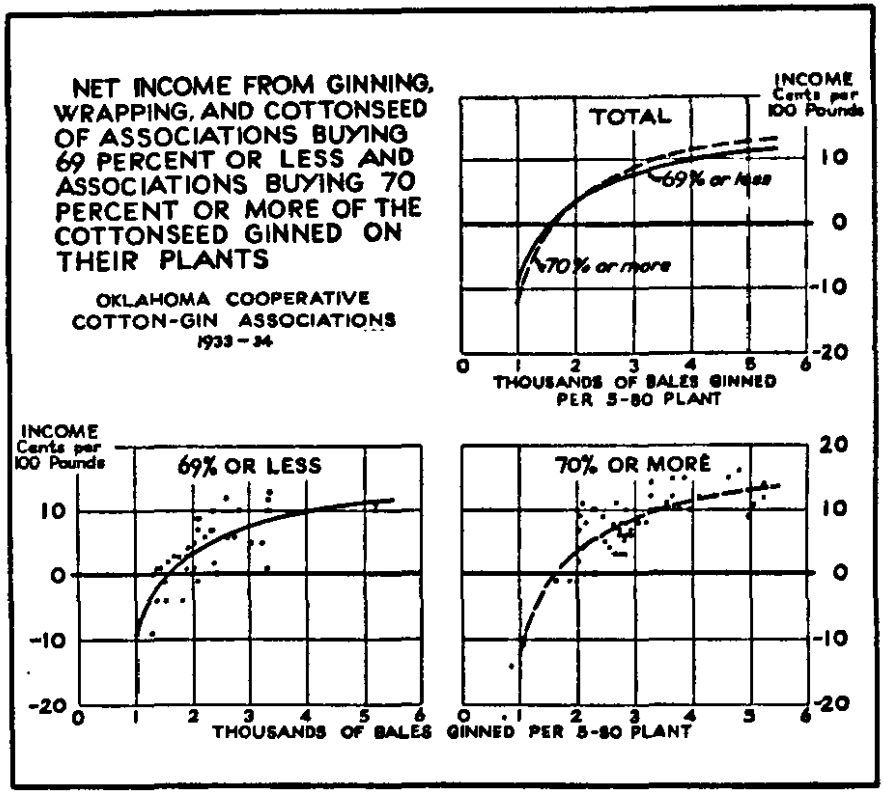



FIGURE 19.—With a volume of less than 2,000 bales per 5–80 plant, associations that bought the largest proportions of the cottonseed ginned on their plants did not realize the highest net incomes per unit.

when the volume ginned was above 2,500 bales, but a lower income when the volume ginned was below 2,500 bales (fig. 19). The explanation for this unusual difference at the lower volumes is in the average net income per ton of cottonseed handled. With a volume below 2,500 bales, the average per ton income to the association was somewhat more for the associations that bought 69 percent or less of the cottonseed ginned than for associations that bought 70 percent or more.

To the extent that a high income to the association per ton of cottonseed bought meant a low initial price to the grower, the small percentage of cottonseed handled by the gin was due in part to the low price paid the grower. A relatively low price for cottonseed would in turn tend to cause the grower to sell less cottonseed, which would also tend to contribute further to a low volume by making it more attractive for customers to patronize nearby gins offering a higher price for cottonseed.

These results emphasize again the desirability and necessity of determining separately the amount of patronage dividends for each

activity. If it were explained to the members that the income on cottonseed purchases would be computed separately from that on other activities, and paid back as a separate patronage dividend, the initial price paid by the association would not have so much effect on the quantity of cottonseed sold by members as under the present methods of calculating dividends.

### *Effect of the Manager's Training, Experience, and Education*

The effect of the training, education, and experience of the manager is somewhat more important with respect to income than with respect to expenses, because the successful selling of cotton and cottonseed bought from patrons and handling of feed, coal, and other side lines sold to patrons, requires more business ability than that necessary to the mechanical operation of a gin plant.

As pointed out under the discussion of expenses, such factors as training, experience, and education of the manager cannot be definitely measured statistically. However, a comparison between the per unit incomes of associations grouped according to these more or less partial measures of managerial efficiency shows some tendencies that are somewhat more pronounced than in the case of expenses. As in the case of expenses, however, these tendencies are not conclusive.

Associations whose managers obtained their previous training in the gin office, as compared to those whose previous training was in the gin plant, apparently realized a higher per unit income (or sustained a lower per unit loss) when comparisons between the two groups are made at the same volumes. As previously mentioned, there was no apparent difference in the per unit expenses of associations grouped according to the previous experience of the manager.

The per unit income appeared to be influenced by the number of years' experience of the manager. Associations that employed the same manager year after year tended to have a slightly higher income at all volumes of ginning represented than associations that changed managers every 2 or 3 years. As pointed out under expenses, this factor did not appear to have any material significance.

On the average, associations whose managers had some education or training in high schools or colleges tended to realize a higher net income than associations whose managers had only a common school education. Similar results were observed with respect to per unit expenses in that the expenses of associations managed by men with some training or education in high schools or colleges appeared to be lower than that of associations managed by men with only a common school education.

## Income From Each Activity as Related to the Number of Bales Ginned

Cottonseed accounted for more than half of the total income of associations ginning 2,500 bales or less per 5–80 plant. The income from ginning was less than the income from bagging and ties until a volume of approximately 2,900 bales was reached, and less than the income from cottonseed until a volume of nearly 3,500 bales was ginned (table 32 and fig. 20).

TABLE 32.—INDICATED AVERAGE INCOME FROM EACH ACTIVITY, PER BALE GINNED, AT SPECIFIED VOLUMES [1]

| Bales ginned [2] | Average income [3] per bale from— | | | | | |
|---|---|---|---|---|---|---|
| | Ginning | Bagging and ties | Cotton-seed | Bale cotton | Side lines | Total |
| 1,000 | −$3.18 | $0.29 | $0.86 | $0.11 | $0.34 | −$1.38 |
| 1,500 | −1.36 | .30 | .78 | .16 | .16 | .04 |
| 2,000 | −.45 | .32 | .75 | .18 | .07 | .87 |
| 2,500 | .11 | .32 | .73 | .18 | .04 | 1.38 |
| 3,000 | .46 | .32 | .73 | .20 | .00 | 1.71 |
| 3,500 | .73 | .34 | .70 | .20 | −.02 | 1.95 |
| 4,000 | .93 | .34 | .70 | .20 | −.04 | 2.13 |
| 4,500 | 1.07 | .34 | .70 | .21 | −.05 | 2.27 |
| 5,000 | 1.20 | .34 | .68 | .21 | −.06 | 2.36 |

[1] Data in this table were computed from data in table 28. Income (or loss) from each activity in terms of cents per 100 pounds was first obtained by taking the difference between each succeeding pair of columns in table 28. Figures thus obtained were converted into per bale figures by multiplying each by 17.84—the average number of hundred pounds of seed cotton per bale for all 95 associations. Income or loss from ginning and from all activities combined, as shown by the first and last columns, are the same as shown by corresponding columns in table 28 except for the difference in the unit in which expressed.

[2] Per 5–80 equivalent plants.

[3] A minus sign indicates a loss.

### *Ginning*

Ginning is the only activity of a cotton gin that is materially affected, insofar as the per unit income is concerned, by the volume of cotton ginned. Income from ginning alone varied from a loss of $3.18 per bale, at a volume of 1,000 bales, to a gain of $1.20 per bale, at 5,000 bales (table 32 and fig. 20). This amounts to an average difference of $4.38 per bale between the income of 5–80 equivalent plants ginning 5,000 bales and of those ginning 1,000 bales. At rates prevailing in 1933–34, the average 5–80 plant operated at a loss from ginning revenues alone until a volume of approximately 2,400 bales was obtained.

### *Bagging and Ties*

The average income from bagging and ties per bale ginned increased gradually with increased volume from 29 cents at 1,000 bales to 34 cents at 3,500 bales. No additional increase was obtained at volumes above 3,000 bales (table 32 and fig. 20).

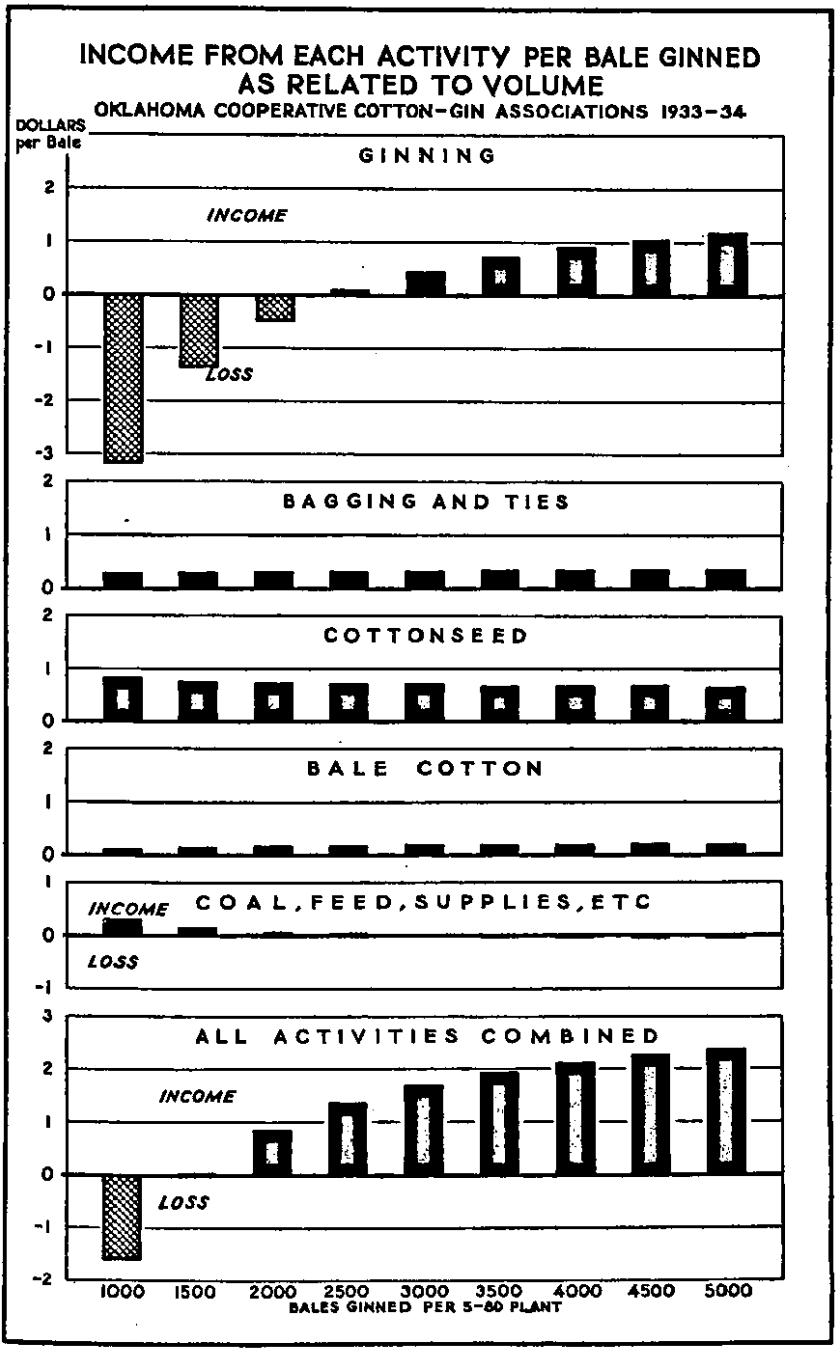



FIGURE 20.—The income from bagging and ties, cottonseed, cotton, and side lines is about the same per bale ginned regardless of volume. These other activities account for most of the total income until a relatively large volume of ginning is obtained.

Since the rate charged for bagging and ties, as set by the State corporation commission for 1933–34 was $1 per pattern, the tendency toward a slight increase in the per bale income from bagging and ties with increased volume up to 3,000 bales is to be explained by lower per pattern costs to the plants having a larger volume of ginning rather than an increased sales price. The associations buying larger quantities of bagging and ties probably were able to obtain a slightly lower price by buying in carlots, and possibly also lower incoming freight or shipping charges.

The income from bagging and ties, as stated above, is relatively high as compared with the income from ginning. For example, with a volume of 2,500 bales, the average income from bagging and ties of 32 cents per bale was nearly three times as much as the average income from ginning of about 11 cents per bale. That is, with an investment of less than $2,000 in an inventory of bagging and ties for only a few months, the income from this source was three times as much as from ginning, with the large fixed investment in gin machinery and buildings.

As a matter of fact the margin of income made on bagging and ties by a cotton gin is nothing more than an addition to or even a part of the ginning rate. The ginning and wrapping of a bale of cotton are inseparable processes. In principle there is no more justification for a gin organization making a separate charge for bagging and ties than there is for making an additional charge for the fiber and metal tags that are usually put on the bales at the gin. It may be, however, that the sum of the ginning rate plus the margin of income realized on bagging and ties is not enough to compensate a gin on the basis of the fixed investment in buildings and machinery.

### *Cottonseed*

The average income from cottonseed per bale ginned declined from 86 cents at 1,000 bales to 68 cents at 5,000 bales (table 32 and fig. 20). This decline of 20 cents per bale ginned in the income from cottonseed is perhaps to be explained in the price paid growers. An association with a relatively large volume of ginning and a satisfactory total income would be inclined to pay growers more initially for cottonseed than another association expecting to make only a small total income or perhaps a loss.

To the extent that the low volume of ginning was the result of a short crop, the grower's requirements for planting seed and feed would make up a larger percentage of the cottonseed ginned. This would further reduce the total income to the gin from cottonseed as a smaller percentage of the cottonseed would be handled. All these factors combined would tend to cause the association with only a small volume of ginning to reduce the initial price paid the grower.

Although not shown by data in table 32, the associations with lower volumes did pay the lowest price for cottonseed. (See p. 71.)

The net income from cottonseed, together with the income from bagging and ties, at a ginning volume of 2,400 bales amounted to approximately $1.05 per bale or a total of $2,520. As previously shown, at a volume of 2,400 bales the average 5–80 plant just about realized expenses at the ginning rates of 20 to 22½ cents per 100 pounds of seed cotton which prevailed during the 1933–34 season. With a ginning rate of 20 and 22½ cents, therefore, the average 5–80 plant ginning 2,400 bales realized a net income of $2,520, or a 10-percent return on a $25,200 investment, without having made any net income at all from ginning proper.

These figures are presented here in order to emphasize the fact that certain income accrues to a cotton-gin organization, in addition to the income from ginning proper. Even though the commercial ginning rate as such appears to be low, cooperative cotton-gin associations are still able to make substantial savings for their members in handling bagging and ties, and cottonseed. The figures also emphasize that the total net income to the association should be distributed among the members in proportion to the business contributed by each member to each department. That is, since cottonseed accounts for approximately half the income, a member who gins 10 bales of cotton and sells 4 tons of cottonseed to the gin, should receive a larger patronage dividend than a member who gins 10 bales but sells only 1 ton of seed to the gin.

### *Cotton Purchases*

Although a number of associations handled cotton at a loss, the 95 associations as a group realized a slight income from handling cotton. Income from this source increased slightly with the number of bales ginned. At 1,000-bale volume, an average net income from handling cotton of 11 cents per bale ginned was realized; at 5,000-bale volume, a net income of 21 cents per bale ginned was realized (table 32 and fig. 20). Associations ginning 5,000 bales netted on the average nearly twice as much per bale from cotton-buying operations as associations ginning 1,000 bales. This average total income from cotton would amount to $110 for the associations ginning 1,000 bales and an average of $1,050, or almost 10 times as much, for associations ginning 5,000 bales.

These figures definitely indicate that associations with a low volume of ginning did not engage in cotton-buying operations to make money on cotton. Their objective was evidently to offer this marketing service practically at cost, and in some cases at a loss, in order to

attract ginning customers. It is entirely possible that some of the associations increased their total net income indirectly as a result of handling cotton even though a loss was realized on the cotton as such. To the extent that the total volume ginned was greater as a result of the association's cotton-buying policy and the ginning expenses per bale thereby reduced, the resulting increase in the per bale income from ginning could exceed the loss per bale on cotton.

### *Side Lines*

Income from miscellaneous side lines decreased with increased volume of ginning. At 1,000-bale volume the income from side lines amounted to 34 cents per bale ginned; at 3,000-bale volume side lines appeared to be handled at cost; and at 5,000-bale volume they were handled at an average loss of 5 cents per each bale ginned (table 32, fig. 20).

Associations with a low volume of ginning, and consequently a low income or a loss, would be more interested in supplementing their income by handling side lines than would associations with a relatively larger volume or satisfactory income from the activities regularly associated with ginning. The associations ginning a large volume of cotton would be more apt to handle side lines at cost or even at a small loss just to accommodate their members than would associations with a low volume of ginning which had to make side lines a source of revenue.

Side-line activities appear to offer the solution to one of the biggest problems of cooperative gin associations—that of providing continuous yearly employment for the manager and bookkeeper. Many different kinds of farm supplies, such as coal, feed, seed, and fertilizer, seasonal hardware such as cotton sacks, hoes, and even farm implements and repairs, could be handled by a cooperative gin association. In addition almost every cooperative gin has enough members and prospective members to justify a gas and oil station. Even though no material net gain is realized, if these interseason activities could result in enough income to pay the salaries of the manager and bookkeeper during the inactive ginning months, they would be very worthwhile. By this means more capable managers could be attracted to cooperatives, and some of the capable ones now in charge could be paid a salary commensurate with the services which they are rendering and the responsibilities of their position.

The policy of handling such side lines could aid materially in keeping the cooperative organization and its records active and intact throughout the year rather than just during the few months of the ginning season. Handling of farm machinery and repairs, together with certain seasonal hardware requirements for cotton farms, is

especially well adapted to accomplish this end because the active season for the sale of these products comes during the most inactive part of the ginning season.

A cooperative cotton gin association, in some respects at least, is in an ideal position to handle farm supplies. The permanent location of the gin plant with its office and overhead organization should enable these farmers to set up a purchasing association much more easily than in other sections of the country where purchasing activities are the only source of revenue. That is, since purchasing associations have developed in other areas and succeeded on the saving effected on purchases alone,[16] purchasing activities in connection with the permanency of a cooperative gin organization should strengthen both activities.

A somewhat comparable development has occurred in connection with cooperative grain elevators. Elevators, like cotton gins, are highly seasonal. According to Green,[16] cooperative elevator associations that handled farm supplies had a higher income than those that did not handle such supplies. The number of members and the relationship of members to the cooperative is very much the same for cotton gins as for elevators.

In view of the experiences of some Oklahoma associations in which the problem of losing members has arisen as a result of refusing or allowing credit on farm supplies sold directly by the gin association, a separate cooperative organization for the handling of side lines seems advisable. It might be served by the same board of directors and the same manager, and made up of practically the same membership as the ginning association. A sound credit policy should be decided on by the board of directors. It should be rigidly adhered to by the manager. Generally, it is best to sell only for cash, even if, as may be expected, some patrons will be offended when refused credit.

Unless the cooperative gins expand into other activities so that they can pay salaries adequate to obtain managers of the type needed, it would probably be better for these associations to keep to smaller and more interested memberships and smaller gin plants, confining their activities to ginning for members only. Comparable organizations exist among the local creamery cooperatives in Minnesota.[17] The head buttermaker of the associations, with the assistance of the board of directors, acts as the manager. If cooperative cotton gin associations are not too large in number of members, size of plant, or

[16] See Knapp, Joseph G., and Lister, John H. COOPERATIVE PURCHASING OF FARM SUPPLIES. F. C. A., Coop. Div. Bull. 1, 92 pp., illus., 1935.

[16] See Green, Roy M., and Ballinger, Roy A. MEMBERSHIP, FINANCIAL, AND OPERATING STATUS OF COOPERATIVE COUNTRY ELEVATORS IN OKLAHOMA, 1931-34. F. C. A., Coop. Div. Misc. Rept. 6, 25 pp., illus., 1936. [mimeographed.]

[17] Black, John D., and Guthrie, Edward S. ECONOMIC ASPECTS OF CREAMERY ORGANIZATIONS. Minn. Agr. Expt. Sta. Tech. Bull. 26, 111 pp., illus., 1924.

volume of business, and do not handle cotton or any appreciable number of side lines, the services of a manager other than the head ginner are hardly necessary.

## Difference in Cooperative and Commercial Gins With Respect to Buying Cotton

Although the number of bales to be ginned in a given area during a given season is somewhat fixed, it may be possible for a few gins in an area to increase their total income in dollars by means of buying cotton above the market price, if by so doing additional volume is attracted to those plants. In addition to being somewhat unethical, this means of securing additional volume and new members or patrons is even more unsound for a cooperative organization than for a commercial gin. In either case the profits depend on greater gains from increased volume than losses from cotton bought. It is obvious that a loss purposely taken on a bale of cotton bought solely to secure ginning that would otherwise go to another plant, is nothing more than a concealed reduction in ginning rates.

It is entirely possible for such practices to be profitable to a commercial gin and yet under identical circumstances be unprofitable to a cooperative gin association. A commercial gin is interested in the total net income in dollars regardless of the number of bales ginned, while the members of a cooperative gin are interested in the net income per bale ginned. For example, a commercial gin organization might increase its volume from 1,500 to 1,800 bales and its net income from $4,500 to $5,000 as a result of buying cotton. This would, of course, be profitable. For a cooperative gin, however, the $5,000 net income divided among the 1,800 bales would result in patronage dividend of only $2.78 per bale. On the other hand the $4,500 divided among the 1,500 bales would result in a patronage dividend of $3 per bale.

Since the income from bagging and ties and from cottonseed is about the same per bale ginned regardless of the volume of ginning, the only factor that contributes to increased income per bale as a result of increased volume is the decline in per unit ginning expenses. For this reason a cooperative gin cannot afford to lose as much per bale on buying cotton as a commercial gin in order to get an additional volume of ginning. The cooperative gin has only the additional income per bale from ginning associated with increased volume, while the commercial gin has in addition the average income per bale from wrapping and from cottonseed.

Additional volume would tend to increase the total income from cottonseed and wrapping but not the per bale income. That is, since the additional amount of income from these sources would be divided

on the basis of patronage among a correspondingly greater number of bales, the amount per bale would not be increased. The only net saving, therefore, which a cooperative gin organization would realize in paying above the market for cotton in order to attract additional volume would be in reduced ginning expenses, and the resulting increase in net income per bale from ginning proper. The income per bale from cottonseed and wrapping would presumably be returned to the patrons in proportion to the amount of business contributed by each.

Data in table 33 show a theoretical comparison between cooperative gins and commercial gins with respect to the amount each may lose per bale on cotton and buy every bale ginned, without reducing the real income, provided specified increases in volume ginned are obtained as a result of buying cotton.

TABLE 33.—ESTIMATED MAXIMUM LOSS PER BALE GINNED THAT MAY BE OFFSET BY INDICATED INCREASES IN VOLUME GINNED WITHOUT CHANGING THE NET INCOME PER BALE OF COOPERATIVE GINS OR THE TOTAL INCOME OF OTHER GINS [1]

| Gin group and estimated bales ginned if no cotton is bought | Maximum loss per bale ginned offset by specified increases in volume | | | | | Gin group and estimated bales ginned if no cotton is bought | Maximum loss per bale ginned offset by specified increases in volume | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1,500 bales | 2,000 bales | 2,500 bales | 3,000 bales | 3,500 bales | | 1,500 bales | 2,000 bales | 2,500 bales | 3,000 bales | 3,500 bales |
| Cooperative gins: | | | | | | Other gins: | | | | | |
| 1,000 | $1.82 | $2.73 | $3.29 | $3.64 | $3.91 | 1,000 | $2.18 | $3.76 | $3.88 | $4.34 | $4.65 |
| 1,500 | ------ | .99 | 1.47 | 1.82 | 2.09 | 1,500 | ------ | 1.26 | 1.89 | 2.34 | 2.68 |
| 2,000 | ------ | ------ | .56 | .91 | 1.18 | 2,000 | ------ | ------ | .77 | 1.26 | 1.63 |
| 2,500 | ------ | ------ | ------ | .35 | .62 | 2,500 | ------ | ------ | ------ | .52 | .92 |
| 3,000 | ------ | ------ | ------ | ------ | .27 | 3,000 | ------ | ------ | ------ | ------ | .42 |

[1] These per bale figures were calculated from the data in table 32. For example, the $1.82 in the column under the heading "Cooperative gins" is the decrease in the per bale loss (increase in income) from ginning 1,500 bales as compared to 1,000 bales ($3.18 less $1.36). The $2.18 in the column under the heading "Other gins" was obtained as follows:

(1) The increase in income (decrease in loss) resulting from an increase in volume from 1,000 to 1,500 bales would be $2,730 ($1.82×1,500).

(2) For a commercial gin, this additional 500 bales ginned (1,000 to 1,500) would result in some additional income from cottonseed and bagging and ties. At 1,500 bales volume, according to table 32 these gins had an income per bale ginned of 30 cents from bagging and ties, and 78 cents from cottonseed. This would increase the total income $540 (500 bales×$1.08).

(3) The sum of the increased income from ginning and the increased income from cottonseed and bagging and ties would be $3,270 ($2,730 plus $540).

(4) Dividing this $3,270 increase by 1,500, the total number of bales ginned gives an average of $2.18 per bale.

(5) Therefore a commercial gin could lose $2.18 per bale in buying cotton, and buy every bale ginned without reducing its income in dollars, if by so doing its volume could be increased from 1,000 to 1,500 bales.

According to these figures, if a commercial gin operating under identical conditions could increase its volume from 1,500 to 2,500 bales as a result of buying cotton at a loss, it could lose an average of $1.89 per bale ginned on the cotton bought and still realize the same net income in dollars at 2,500 bales as it would have made by ginning 1,500 bales without losing any money on cotton. Under similar circumstances, however, a cooperative gin could take an average

loss on cotton of only $1.47 per bale ginned without reducing the net income in dollars per bale.

For either the cooperative or the commercial gin the additional margin of income which results from a 500-bale increase in volume is much greater for the low-volume gins than for the high-volume gins. For example, a cooperative gin that increases its volume from 1,000 to 1,500 bales raises its income $1.82 per bale, while a 500-bale increase in volume from 3,000 to 3,500 bales increases the income per bale only 27 cents. Likewise, the commercial gin gains $2.18 per bale by increasing volume ginned from 1,000 to 1,500 bales, but only 42 cents per bale by increasing volume ginned from 3,000 to 3,500 bales.

Under competitive conditions, increasing income by securing additional volume as a result of buying cotton at a loss is more theoretical than real. If such a practice is started by one gin in a community, competitive gins are forced to offer the same inducements. The result is that the volume ginned by each plant is approximately unchanged even though cotton is bought above the market price. As was previously mentioned, these practices are nothing more than a concealed reduction in ginning rates and as such are decidedly unethical.

From the standpoint of cooperative gin associations, any additional business or new members obtained by special price concessions are of questionable value and doubtful permanence. A cooperative gin that purposely buys cotton from members [18] above the price at which the cotton can be resold is, in effect, paying a patronage dividend in advance. Such a practice results in gross inequalities in patronage dividends because the loss on cotton which is an overpayment to some patrons must necessarily be taken from some other department of the ginning business.

If it is absolutely necessary that a cooperative gin association buy cotton to accommodate the regular members with this marketing service, the patronage dividends should be calculated separately on each department. That is, the income on bagging and ties and ginning should be prorated on the pounds of seed cotton ginned by each patron; the income on cottonseed prorated on the basis of the tons of seed sold by each member to the association; and the income or loss on cotton prorated on the basis of pounds of lint cotton purchased from each patron. If the cotton is either bought or sold on grade and stable, the factor of quality should possibly also be considered in prorating income or losses on cotton. It is just as logical and equitable that losses in any one activity of a cooperative gin be prorated to those responsible for these losses, as it is that income be prorated to members in proportion to business done by each.

[18] Assuming that all patrons are members, and they must be treated as such with respect to dividends if the organization is truly cooperative.

Since the theory of cooperative cotton ginning with its associated enterprises is to render these services at cost, the only sound principle of operation is to place each activity on a separate dividend basis. Combining the income from all activities into one dividend is certain to be inequitable, because the per unit income in the several activities is entirely different. In addition, every department or activity is not patronized by the member in the same proportion.

With respect to cotton-buying operations, it should be emphasized that the speculative holding of cotton or short selling has no place in a cooperative organization. Cotton purchases should be resold at least daily. If the manager or buyer for a cooperative cotton gin association is not sufficiently skilled in the cotton business to realize a reasonable merchandising profit on cotton bought from day to day, then by no stretch of the imagination could he be expected to be sufficiently skilled to outguess the future movement of cotton prices. If some of the individual members of a cooperative cotton gin are desirous of speculating on price changes, it would be much more equitable and logical for them to hold their own products or sell short, as the case may be. They would thereby assume the risk as individuals and not endanger the financial stability of the cooperative association.

Members of cooperative cotton-gin associations cannot expect the manager of their gin, who may not be particularly well trained in marketing cotton, to buy their cotton in the name of the association and pay them the exact market price each day on the basis of the quality of each individual bale without incurring risks that must be borne by the association. It would be more logical and wiser from the standpoint of the association to receive the cotton and sell it for the individual account of each member. Sales could be made through some cooperative cotton-marketing association, to some reliable commercial cotton firm, or through a broker. If the gin association has sufficient cash assets, it could, without any material risk, make a substantial advance payment on each bale of cotton received, pending a final outturn on the sale of the cotton for the member's account. Handling cotton by cooperative gins, as it is practiced under present conditions, places the financial risk of any change in price, as well as any misjudgment of the manager, on the members of the cooperative as a group and, because of the risk involved tends to discourage payment for cotton bought on the basis of the value of individual bales. A member who is unwilling to await the returns from cotton sold for his own account, but instead insists that the gin buy his cotton outright and sell it for the account of the cooperative (the association assuming or guaranteeing the accuracy of the class, weight, and price), is not desirable as a member of a cooperative

association. Cooperative enterprises having a majority of such members have little chance for success. If a cooperative cotton-gin association finds it necessary to buy cotton at a loss in order to attract volume, it is operating on a very unsound basis.

## Percentage of Return on Investment

### *Basis of Valuation*

In order to determine the relationship of net income to investment (the percentage return on investment) it is first necessary to decide what basis of valuation to use as the investment. Some of the bases that might have been used are as follows: (1) The original cost of land, buildings, and machinery; (2) the original cost of these assets less depreciation; (3) the replacement cost; (4) the present book value of all assets; or (5) the amount of capital and surplus (net worth) which the members have invested.

Original cost of fixed assets was used in this analysis as the investment. The figures obtained in this survey on the original cost of fixed assets are reasonably accurate. Seventy of the ninety-five associations were organized during the 3-year period 1927–1929, and most of these purchased new plants. From the standpoint of any one association, original cost is the basis on which a profitable return must be made if the organization is successful.

Although the investments made by these associations when first organized may not reflect present requirements, they are, to some degree at least, comparable one with another. The objective is not so much to determine whether the returns realized by these associations are high or low, but to compare the return on investment as influenced by size of plant and sources of income.

### *Relative Importance of Sources of Income*

The average return for all 95 associations from all sources of income was 12.9 percent (table 34). Thirty-two, or about one-third of the associations, realized less than a 5-percent return. This would mean that only a very few of these 32 associations could have paid even a small patronage dividend if an average of only 4 percent was paid to members on capital stock and to holders of notes and mortgages. Less than a 10-percent return was realized by 46 associations, while 49 associations made more than 10-percent return on the original cost of fixed assets. These 49 associations making above a 10-percent return were generally those that obtained a relatively large volume in proportion to the size of their plants. Sixteen of the associations realized more than a 25-percent return on the basis of the original cost of fixed assts. Any basis of investment other than the original cost of fixed assets would have shown higher returns.

TABLE 34.—ASSOCIATIONS CLASSIFIED ACCORDING TO PERCENTAGE OF RETURN ON ORIGINAL COST OF FIXED ASSETS, BY SOURCES OF INCOME

| Percentage return on original cost of fixed assets [1] | Number of associations realizing specified return from— | | | | |
|---|---|---|---|---|---|
| | Ginning only [2] | Ginning and bagging and ties [3] | Ginning, bagging and ties, and cottonseed [4] | Ginning, bagging and ties, cottonseed, and cotton | All activities |
| −10.0 to −5.1 | 16 | 11 | 3 | 2 | 1 |
| −5.0 to −0.1 | 29 | 18 | 7 | 11 | 12 |
| 0 to 4.9 | 21 | 28 | 23 | 18 | 19 |
| 5.0 to 9.9 | 12 | 13 | 17 | 16 | 14 |
| 10.0 to 14.9 | 8 | 8 | 16 | 13 | 13 |
| 15.0 to 24.9 | 2 | 10 | 15 | 19 | 20 |
| 25.0 to 34.9 | 6 | 5 | 7 | 9 | 9 |
| 35.0 to 44.9 | 1 | 1 | 2 | 2 | 3 |
| 45.0 or more | | 1 | 5 | 5 | 4 |
| Average | 2.7 | 5.4 | 11.7 | 12.6 | 12.9 |

[1] A minus sign denotes a loss.
[2] Based on total original investment in land, buildings, gin machinery, and office equipment.
[3] Original cost of trucks added to items listed in footnote 2.
[4] Original cost of other building and equipment added to items listed in footnotes 2 and 3.

As shown by the average for all 95 associations, the return on investment increased as the income from each additional activity was included. The average return on ginning alone was only 2.7 percent. This percentage return increased with the addition of each source of income and amounted to an average of 12.9 percent when all sources of income were included. From the standpoint of individual associations, however, there was considerable variation in the rate of returns realized. On ginning alone, 66 of the associations made less than a 5-percent return. The addition of the income from bagging and ties to that of ginning showed 57 associations realizing less than 5 percent, the additional inclusion of the income from cottonseed showed only 33 associations below 5 percent, and with income from cotton added, only 31. When the income from all activities was included there were 32 associations that realized less than a 5-percent return.

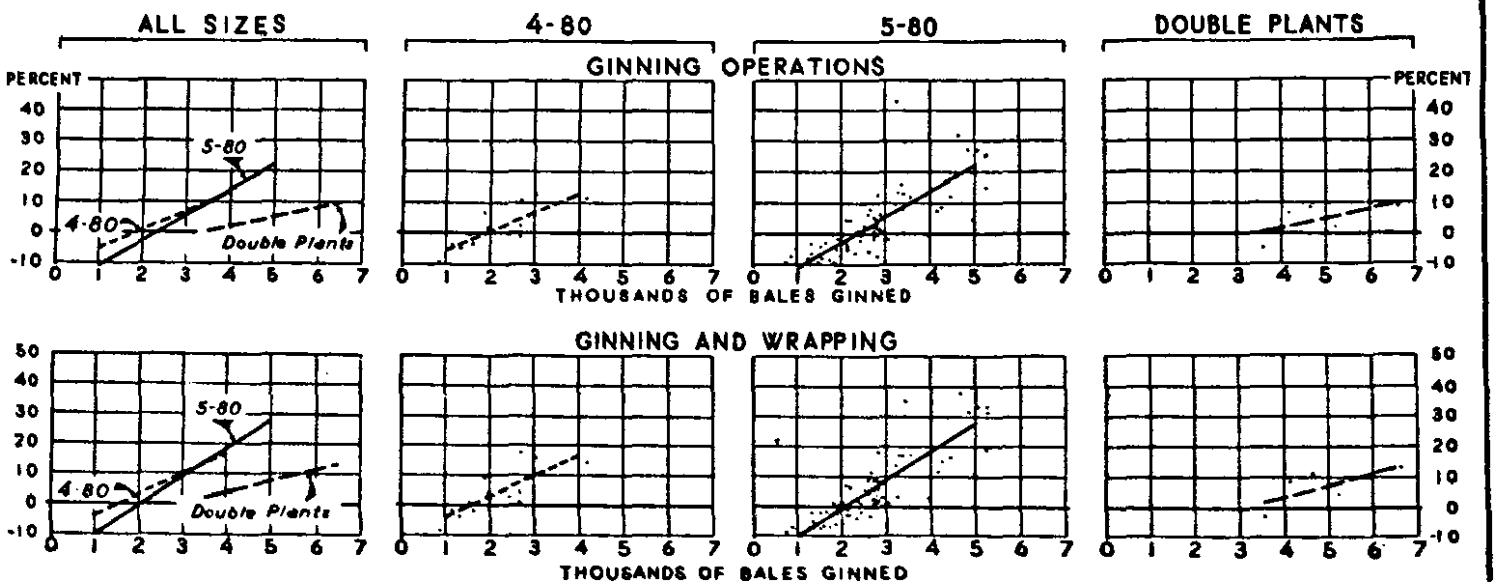
On the other hand, 7 associations made more than a 25-percent return on ginning alone and the same number more than 25 percent on ginning and wrapping combined; 14 made more than 25 percent when the income from cottonseed was included; 15 when the income from cotton was included; and from all activities, 12 associations showed more than a 25-percent return.

### *Influence of Size of Plant, Sources of Income, and Volume Ginned*

The percentage return on the original investment was higher for each smaller-size group of plants as long as the plants in each group were ginning less than normal capacity. The rate of return increased

## PERCENTAGE RETURNS ON ORIGINAL COST OF FIXED ASSETS AS RELATED TO SIZE OF PLANT, SOURCES OF INCOME, AND VOLUME GINNED

OKLAHOMA COOPERATIVE COTTON-GIN ASSOCIATIONS, 1933-34



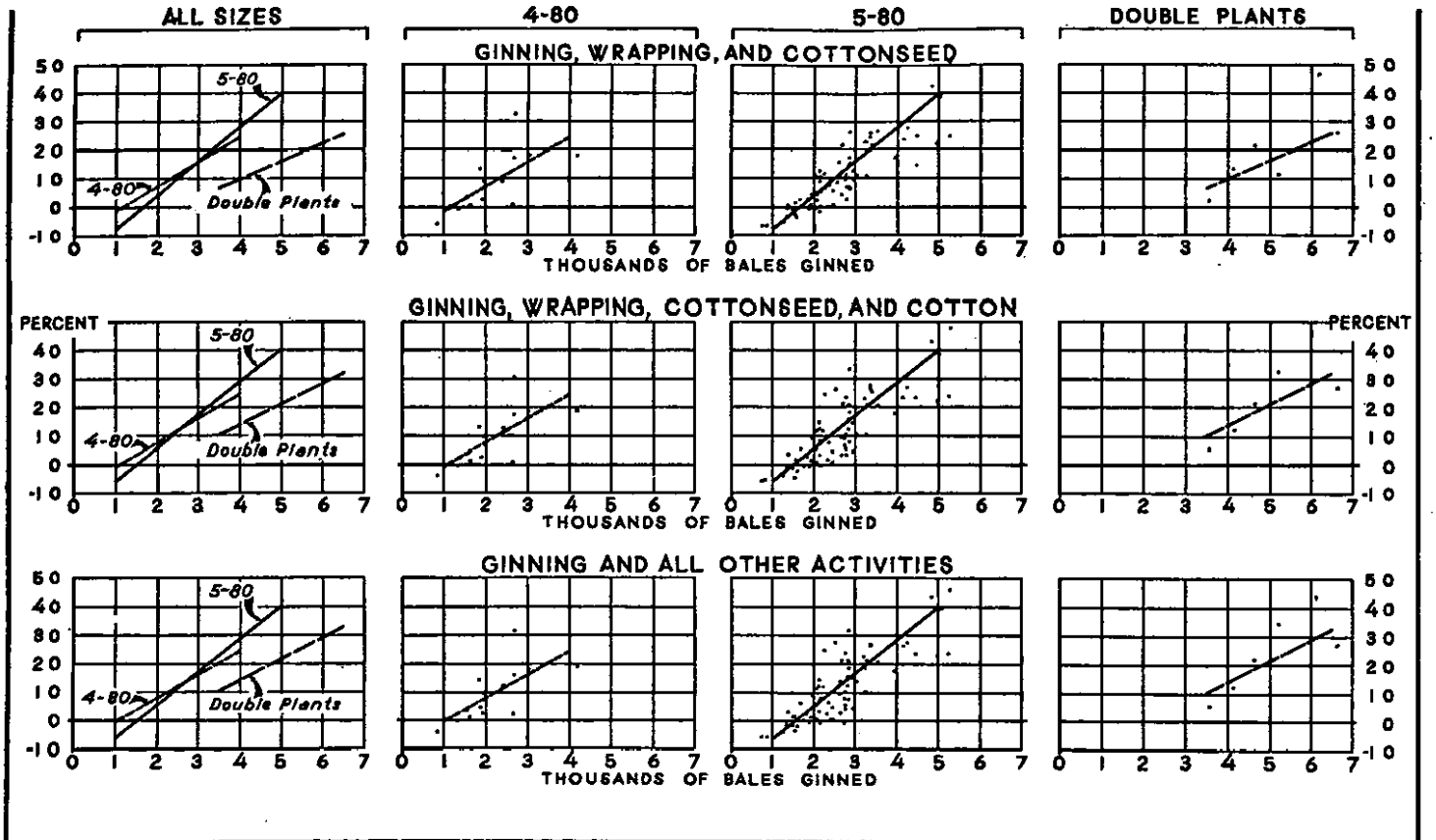



FIGURE 21.—The return on investment was higher with increased volume ginned, with additional sources of income, and for plants of each smaller size.

with additional volume for the plants of each size group, but the rate of increase was more pronounced for 5–80 plants than for either smaller or larger ones. The addition of each of the other sources of income one at a time to that of ginning tended to bring the return of plants of different sizes closer together (table 35 and fig. 21).

TABLE 35.—PERCENTAGE RETURN ON ORIGINAL INVESTMENT AT SPECIFIED VOLUMES, BY SIZE OF PLANT AND SOURCES OF INCOME

| Bales ginned | Percentage of returns on original investment from— | | | | |
|---|---|---|---|---|---|
| | Ginning only | Ginning and bagging and ties | Ginning, bagging and ties, and cottonseed | Ginning, bagging and ties, cottonseed, and cotton | Ginning, bagging and ties, cottonseed, cotton, and side lines |
| 4–80 plants: | | | | | |
| 1,000 | −5.3 | −3.8 | −0.9 | −0.4 | −0.2 |
| 2,000 | .8 | 3.1 | 7.4 | 7.8 | 8.0 |
| 3,000 | 6.9 | 10.0 | 15.7 | 16.0 | 16.3 |
| 4,000 | 13.0 | 16.8 | 24.1 | 24.2 | 24.5 |
| 5–80 plants: [1] | | | | | |
| 1,000 | −11.1 | −10.2 | −7.8 | −6.8 | −6.4 |
| 2,000 | −2.8 | −0.7 | 4.2 | 5.8 | 6.4 |
| 3,000 | 5.6 | 8.8 | 16.2 | 17.3 | 17.1 |
| 4,000 | 14.0 | 18.3 | 28.2 | 28.8 | 28.8 |
| 5,000 | 22.4 | 27.8 | 40.1 | 40.4 | 40.5 |
| Double plants: | | | | | |
| 3,000 | −1.4 | .1 | 3.9 | 6.6 | 6.8 |
| 4,000 | 1.8 | 3.9 | 10.2 | 13.9 | 14.2 |
| 5,000 | 5.0 | 7.6 | 16.4 | 21.3 | 21.7 |
| 6,000 | 8.2 | 11.4 | 22.7 | 28.6 | 29.2 |

[1] Includes 6, 5–70's and 2, 6–70's.

At a volume of 3,000 bales, the net income from ginning alone amounted to a return on the original investment of 6.9 percent for 4–80 plants and 5.6 percent for 5–80 plants. At a 3,000 bale-volume, the double plants lost money. Even for the smaller plants, at a 3,000-bale volume, the income from ginning alone as separate from other activities was little, if any, more than enough to pay interest on the amount of capital investment required. By including the income from bagging and ties with that from ginning, the return at 3,000 bales was 10 percent for 4–80 plants and 8.8 percent for 5–80 plants. Adding the income from cottonseed to that of ginning and wrapping, the return on investment at 3,000 bales volume was 15.7 percent and 16.2 percent for 4–80 and 5–80 plants, respectively. The further addition of the income from cotton and from miscellaneous side lines increased the return slightly. At a 4,000-bale volume the 4–80 plants had an average return on original investment from all activities of 24.5 percent; at 5,000 bales the 5–80 plants showed a 40.5-percent return.

In studying the income from the ginning business these data emphasize the necessity of considering all the sources of revenue. The

ginning rate or the return on investment cannot be said to be either high or low without taking into consideration the income from bagging and ties, cottonseed, cotton, and other side lines, as well as the income from ginning proper.

## Distribution of Earnings

### *Purposes for Which Earnings Were Distributed*

These 95 associations as a group had an operating income of 418,786.99. The purposes for which these earnings were distributed are shown in table 36. Nearly 64 cents of each dollar earned, or a total of $266,998.94, was returned to members as dividends on stock or as patronage dividends. The dividends on stock amounted to 13.7 cents per dollar earned, or a return of 3.7 percent on the total outstanding stock. Patronage dividends, at a total of $209,790.22 for the 95 associations, amounted to 80 cents per bale ginned, or approximately one-half of the income from operation (table 2). Interest on notes and mortgages took 16 cents out of every dollar of earnings or a total of $67,020.24. This amount would also have been available for dividends had the members invested all the necessary capital.

TABLE 36.—PURPOSES FOR WHICH THE NET OPERATING INCOME WAS USED

| Purpose | Income expended | | |
|---|---|---|---|
| | Total for 95 associations | Average per association | Percentage of total |
| Interest on borrowed money | $67,020.24 | $705.48 | 16.0 |
| Dividends on stock | 57,208.72 | 602.20 | 13.7 |
| Patronage dividend | 209,790.22 | 2,208.32 | 50.1 |
| Farmers Union dues | 9,564.66 | 100.68 | 2.3 |
| Federal income tax | 2,422.99 | 25.51 | .6 |
| Dues and subscriptions [1] | 1,478.26 | 15.56 | .4 |
| Loss on bad accounts | 35,847.27 | 377.34 | 8.5 |
| Credited to surplus | 35,454.63 | 373.21 | 8.4 |
| Total | 418,786.99 | 4,408.30 | 100.0 |

[1] Include dues to civic and trade organizations, subscriptions to trade papers, and similar items of expense.

In this analysis, interest on notes and mortgages, Federal income tax, dues of individual members paid by the association to general farm organizations, miscellaneous dues of the association to overhead and civic organizations, and losses on bad accounts were considered as a deduction from income in determining the net amount available for refund to patrons. All of these items, however, are similar to dividends on capital stock and patronage dividends. To the extent that a cooperative association is financed by borrowed capital rather

than by the investment of members in the capital stock of the association, the interest paid is, in effect, a fixed dividend paid to the holder of notes and mortgages. If the members themselves contributed enough capital to purchase a plant outright without borrowing, it would, of course, not be necessary to pay interest. On the other hand, to the extent that a cooperative association borrows funds to purchase fixed assets, those agencies or individuals loaning the money are, in effect, investing in the cooperative enterprise and are due a share of the income.

Likewise, dues to other organizations paid by the cooperative for its members are, in effect, a dividend to these members. Such a distribution of earnings, however, has no relationship to patronage. Loss on bad accounts is also a distribution of profits to some members or patrons even though it is inequitable and unearned. Federal income taxes are, by definition, a portion of income. However, a true cooperative is not obligated to pay Federal income taxes.

Since the payments of any of the above-mentioned charges are not absolutely essential to the operation of a cooperative cotton-gin association, they have been considered as a distribution of earnings rather than expense of operation. Moreover, the payment of such charges varies considerably from one association to another and depends on the operating policies and methods of financing of each. The inclusion of such charges as expenses would result in the figures not being comparable from one association to another.

These associations as a group could have paid $1.15 patronage dividend on each bale ginned after paying a 5-percent dividend on all outstanding stock and after setting aside a 10-percent special surplus reserve as required by State law, had none of the earnings been required for interest on notes, member and association dues, Federal income tax, or for losses on uncollected accounts.

If all of the patrons of these 95 cooperative gin associations are considered as members with respect to dividends (and they must be from the standpoint of Federal income tax, if the organization is to be classed as a cooperative) they received, in the form of dividends, dues, canceled accounts, and increased equity (addition to surplus), approximately 83 cents of each dollar of net income for the 1933–34 season.

### *Percentage of Net Income Appropriated for Each Purpose*

There were wide differences between the individual associations that made a net income in the purposes for which this income was used. The 82 associations that realized a net income from all operations are classified in table 37 by the number that distributed given percentages of their income to specified purposes.

TABLE 37.—ASSOCIATIONS [1] CLASSIFIED ACCORDING TO THE PERCENTAGE OF TOTAL INCOME APPROPRIATED FOR SPECIFIED PURPOSES [2]

| Percentage of net income | Number of associations using income for— | | | | | | |
|---|---|---|---|---|---|---|---|
| | Interest on borrowed capital | Stock dividends | Patronage dividends | Farmers' union dues | Other dues | Federal income tax | Loss on bad accounts |
| None | 12 | 41 | 40 | 26 | 67 | 68 | 59 |
| 0.1 to 5.0 | 20 | 2 | 2 | 40 | 14 | 11 | 10 |
| 5.1 to 15.0 | 9 | 8 | | 7 | | 1 | 4 |
| 15.1 to 30.0 | 9 | 15 | 1 | 3 | 1 | 1 | 1 |
| 30.1 to 50.0 | 9 | 15 | 5 | 3 | | | 2 |
| 50.1 to 75.0 | 12 | 5 | 12 | 2 | | | |
| 75.1 to 100.0 | 4 | 1 | 12 | | | | 1 |
| 100.1 or more [3] | 7 | 2 | 10 | 1 | | 1 | 5 |

[1] Includes only the 82 associations realizing a net income. The 13 associations reporting a net loss from all operations are not included.

[2] These appropriations of income in every case do not apply to the current income, as several associations paid dividends and income tax on previous year's business during 1933–34, while, on the other hand, some associations had not made full disposition of earnings at the time the reports were received from these associations.

[3] When dividends distributed were more than 100 percent of income these distributions were made during 1933–34 but partly from the surplus of previous earnings.

Interest on borrowed capital and patronage dividends claim the largest portion of income for most of these associations. For example, 32 associations paid out more than 30 percent of their income for interest on borrowed capital, while 39 associations paid out more than 30 percent of their earnings as patronage dividends. For more than half of these 82 associations none of the income was appropriated to stock dividends, patronage dividends, Federal income tax, loss on bad accounts, or miscellaneous dues. Interest on borrowed capital absorbed a part of the income of all but 12 of these 82 associations.

### *Percentage of Income Appropriated as Surplus*

These 82 associations are classified as follows by the proportion of their net income left in the business as surplus earnings as distinguished from paying interest, dividends, and similar items:

| Percentage of total income added to surplus: [10] | *Number of associations* |
|---|---|
| −100.1 or more | 10 |
| −100.0 to −75.1 | 6 |
| −75.0 to −50.1 | 5 |
| −50.0 to −25.1 | 3 |
| −25.0 to −0.1 | 10 |
| 0 to 24.9 | 13 |
| 25.0 to 49.9 | 16 |
| 50.0 to 74.9 | 8 |
| 75.0 to 100.0 | 11 |
| Total | 82 |

[10] A minus indicates that the surplus was reduced by specified percentages of the income in order to pay such items as interest and dividends.

At a volume of approximately 2,000 bales per 5–80 equivalent plant, the total ginning expenses were about the same regardless of the type of power. At volumes below 2,000 bales, plants using electric power had the lowest expenses; at volumes above 2,000 bales, plants using oil or gas power had the lowest expenses. Plants using oil or gas power had the lowest per unit expense at volumes above 2,000 bales, and the highest per unit expense at volumes below 2,000 bales. Plants using electric power had the lowest per unit expense at volumes below 2,000 bales, and the highest per unit expense at volumes above 2,000 bales. Plants using oil power showed the greatest and plants using electric power the least reduction in per unit expense with increased volume.

Local facilities and conditions, in addition to differences in expenses as influenced by different kinds of power units, should determine the most economical and desirable type of power.

Gin labor was one of the largest items of expense for plants of all power types. Though less important with electric plants than with steam or oil plants, labor became an increasingly important item of expense for plants of each power type as volume increased.

At the same volume in bales ginned per season, ginning expenses per 100 pounds of seed cotton were practically the same for plants that ginned mostly snapped cotton as for plants that ginned mostly picked cotton.

The buying of bale cotton did not materially increase the total ginning expenses.

Ginning expenses did not appear to be materially influenced by the previous experience of the manager, or the number of years he had been employed.

Associations ginning more than half of their season's volume within 1 calendar month had lower ginning expenses per unit than those that ginned less than half within any 1 calendar month. This was true regardless of the volume ginned or the number of days the gin was operated during the season.

Associations operating less than 100 days per season had higher ginning expenses per unit than those operating more than 100 days, when the volume ginned was above 2,500 bales per 5–80 plant. At volumes below 2,500 bales, however, associations operating fewer days had lower ginning expenses per unit.

Only one-fifth of the net operating income of these 95 associations combined was from ginning proper. Forty-five of the associations lost money on the ginning operations alone. Ginning and wrapping together accounted for 40 percent of the average net operating income. The net income from wrapping exceeded the net income from ginning for 59 of these 95 associations.

Cottonseed accounted for 47.2 percent of the combined net income for all 95 of these associations. Bale cotton accounted for 65.7 percent of the gross sales but only 10.5 percent of the net income for all 95 associations. Bagging and ties accounted for nearly 20 percent of the total net income for all 95 associations. More than half of the associations had a larger income from bagging and ties than from ginning. Only 36 of these associations handled farm supplies in excess of $500 each.

The per-unit income from ginning increased with the volume ginned, but the rate of increase became less and less with each additional unit of volume. After a certain volume in relation to the size of plant was reached, no material increase in the per-unit income was shown. This volume was approximately 4,000 bales for 4–80 plants; 5,000 bales for 5–80 plants, and 10,000 bales for double plants.

The net income per bale ginned from bagging and ties, cottonseed, and bale cotton was not materially changed with changes in volume. With farm supplies, however, there was a tendency for the income to decrease with increased volume of ginning. Associations ginning more than 3,000 bales per 5–80 plant handled these supplies at a slight loss.

The combined income from ginning and wrapping was less than the combined income from cottonseed, cotton, and side lines until a volume of more than 3,000 bales per 5–80 plant was obtained.

In ginning the same number of bales, associations ginning mostly snapped cotton had a higher income than associations ginning mostly picked cotton.

The buying of cotton as it is practiced by most cooperative gin associations involves hazardous price risks as well as quality and weight risks. At best, cotton buying results in gross inequalities between patrons with respect to patronage dividends.

A cooperative gin should be more interested in the total net income per bale than in the total net income in dollars. For this reason a cooperative gin cannot afford to buy cotton at as great a loss per bale as a commercial gin might take as a means of increasing net income by increasing the volume ginned.

Income was slightly higher for plants whose managers had been previously employed in the gin office than for plants whose managers had been previously employed as ginners; higher for those associations that had employed the same manager 4 years or more than for associations that had changed managers every 2 or 3 years; and also higher for associations that employed managers with a high-school or college education than for those whose managers had had only a common-school education.

These 95 associations purchased and sold more than 43 percent of the 260,717 bales of cotton ginned by them during the 1933–34 sea-

son. Almost three-fourths of the cottonseed ginned from these 260,717 bales was also handled by these associations.

The total income of these associations amounted to an average return of 12.9 percent on the original cost of all fixed assets.

The 4–80 plants realized a higher return on investment than 5–80 plants until a volume of approximately 3,000 bales was ginned. The double plants realized a much lower return on investment than single battery plants.

At prevailing rates the average 5–80 equivalent plant required a volume of 2,500 bales to obtain a return of 10 percent on an original investment. A return of at least 10 percent is necessary in order to pay any appreciable amount of patronage dividends, after paying dividends on capital stock and interest on any indebtedness.

As a group, these associations returned 50 percent of their net operating income for 1933–34 to members in the form of patronage dividends.

Interest on indebtedness took 16 cents of each dollar of operating income. Dividends on capital stock took nearly 14 cents. Thus, the capital furnished by both the members and the creditors claimed nearly a third of the operating income of these 95 associations.

Fifty of the associations paid either stock or patronage dividends, or both, during 1933–34.

During 1933–34, 10 of these associations either created or increased a deficit on their books by paying dividends. The dividends paid by 13 other associations during 1933–34 came out of surplus accumulated during previous years.

About half of the associations increased their surplus as a result of the 1933–34 operations.

# Other Publications Available

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In addition to this bulletin, the following publications on farmers' cooperative organizations are published by the Farm Credit Administration:

**Cooperative Purchasing of Farm Supplies**
Bulletin No. 1, *J. G. Knapp and J. H. Lister*

**Accounting Principles for Cooperative Cotton Gin Associations**
Bulletin No. 2, *O. T. Weaver*

**Cooperative Marketing of Agricultural Products**
Bulletin No. 3, *W. W. Fetrow*

**Cooperation in Agriculture, a Selected and Annotated Bibliography**
Bulletin No. 4, *Chastina Gardner*

**Organization and Operation of the Illinois Livestock Marketing Association**
Bulletin No. 5, *H. H. Hulbert*

**Statistics of Farmers' Cooperative Business Organizations**
Bulletin No. 6, *R. H. Elsworth*

**Cooperative Marketing of Range Livestock**
Bulletin No. 7, *L. B. Mann*

**Mutual Irrigation Companies in California and Utah**
Bulletin No. 8, *Wells A. Hutchins*

**Membership Relations of Cooperative Associations**
Bulletin No. 9, *James W. Jones*

**Loans to Farmers' Cooperatives**
Circular No. 6

**Early Developments in Cooperative Cotton Marketing**
Circular C-101, *O. W. Herrmann and Chastina Gardner*

**Organization and Operation of Cooperative Irrigation Associations**
Circular C-102, *Wells A. Hutchins*

**Western Cattle and Sheep Areas**
Circular C-103, *L. B. Mann*

*These may be obtained free of charge as long as a supply is available from the*

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