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FACTORS AFFECTING HANDLING COSTS *of* COTTONSEED *at* GINS *in Alabama*

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CONTENTS

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FACTORS AFFECTING HANDLING COSTS of COTTONSEED at GINS in Alabama*

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WHILE COTTON LINT has been utilized for centuries, it was not until about 70 years ago that cottonseed became important commercially (5). At that time, less than 12 per cent of the cottonseed produced in the United States were crushed as compared with 90 per cent at the present time (9).

The value of the seed obtained from cotton is equal to about a sixth of the value of the lint. Thus, cottonseed, once a waste product, have become an important source of income to farmers and to cotton gin operators in the Cotton Belt.

Gin operators purchase for crushing purposes practically all of the cottonseed that farmers sell. Gin operators, in turn, sell these cottonseed to oil mills. The marketing channel for cottonseed – from farms to gin operators to oil mills – is the same in most communities. Some mills buy some seed direct from farmers. This is an exceptional practice, however, and usually occurs only

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** R. Wayne Robinson (on leave) was responsible for planning and initiating this study and for collecting the data. The tabulation and analysis of the data and the presentation of results were a responsibility of the author of this report. Acknowledgement is due the gin managers who furnished information for the study; to members of the Technical Committee and the Regional Project Leader for helpful suggestions throughout the formulation and analysis of the study; and to members of the Department of Agricultural Economics who gave freely of their time to discuss the analysis of the data and the presentation of the results.

when large farmers deliver seed to mills, or when mills own cotton gins. Usually it is not economically feasible for farmers to deliver to oil mills.

The number of active cotton gins has been decreasing for at least two decades, both in Alabama and in the United States, even though cotton production has not decreased proportionately. In Alabama, the number of active gins decreased from 1,218 in 1935 to 718 in 1952, a reduction of 41 per cent *(6, 7)*. Cotton production during the same period decreased from 1,059,000 bales in 1935 to 890,000 bales in 1952, a decrease of only 17 per cent.

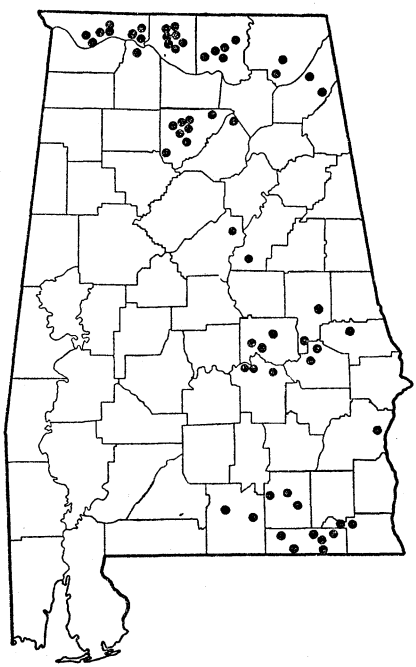

FIG. 1. Location of gin plants studied in Alabama, 1950 and 1951.

The objectives of this study were to determine and evaluate the most economical methods and practices affecting costs of handling cottonseed at gins, with a view of suggesting possible improvements that would lead to increased efficiency and lower costs. If costs can be reduced, farmers should receive over a period of time higher prices for their seed and/or improved ginning services.

A sample of 62 gins located in 22 counties of the State was selected for study (Fig. 1). This sample was drawn on the basis of volume of cotton ginned and the methods used in 1950 to load seed out of storage for transportation to mills. Volume groups in terms of bales ginned were less than 1,000; 1,000-1,999; 2,000-2,999; and 3,000 and over. Forks, portable conveyors, and drop chutes were the methods used in loading seed out of storage.

By the fork method, cottonseed were loaded manually with seed forks. At gins using conveyors, the seed were forked by hand into a conveyor that emptied them into a truck or other conveyance. With the drop chute, seed fell by gravity from a chute or sliding door into a truck underneath.

TABLE 1. NUMBER OF GINS AND VOLUME OF SEED HANDLED PER GIN, BY VOLUME OF COTTON GINNED AND METHOD OF LOADING COTTONSEED OUT OF STORAGE, 124 GINS, ALABAMA, 1950 AND 1951

Bales of cotton ginned	Conveyor[1]			Chute[3]			Fork[4]		
	Gins[2]	Seed handled		Gins[2]	Seed handled		Gins[2]	Seed handled	
		Ginned	Sold		Ginned	Sold		Ginned	Sold
	No.	*Tons*	*Tons*	*No.*	*Tons*	*Tons*	*No.*	*Tons*	*Tons*
Less than 1,000	21	247	188	10	233	190	11	265	209
1,000-1,999	21	592	479	12	578	507	7	566	443
2,000-2,999	12	948	808	10	991	928	4	880	702
3,000 and over	8	1,484	1,267	6	1,673	1,590	2	1,704	1,474
ALL SIZES	62	659	546	38	769	706	24	575	465

[1] Seed were forked by hand into a conveyor which emptied them into a truck or other conveyance.

[2] Number of gins refers to number of gin observations during the 2-year period 1950-51.

[3] Seed fell by gravity from a chute or sliding door into a truck or other conveyance underneath.

[4] Seed were loaded manually with seed forks.

The chute method differed from the fork and conveyor methods in that little labor was involved, and seed houses were not of the conventional type, but were built high enough off the ground that trucks could be driven underneath.

Information pertaining to costs of handling cottonseed during the 1950 and 1951 seasons was obtained by interviewing gin personnel. After the information was collected, classifications of gins according to volume of cotton ginned and method of loading out of storage were made for each year separately. Later, the data were combined for analysis. Thus, the number of gins used in this study indicates the number of gin observations, rather than the actual number of gin plants studied. Number of gins and average volume of seed handled are shown in Table 1.

METHODS AND PRACTICES USED IN HANDLING COTTONSEED

Cottonseed arrive at gins in seed cotton. After being weighed, the seed cotton is drawn into the gin plant, usually by means of a pneumatic conveyor, commonly called the suction. After the

seed and lint are separated (by means of circular saws in the gin stands), the lint is pressed, baled, and weighed.[1] The weight is recorded on a tag that is attached to the bale.

The cottonseed fall into a conveyor underneath the stands. By this conveyor, the seed are usually moved to one end of the gin building and emptied into another conveyor that moves them into overhead seed scales located just outside the gin building, if the gin uses them. If seed scales are not used, the seed go direct to the farmers' chute, an overhead box-like container, from which they are loaded into the farmer's truck or wagon; or they go direct from the gin stands to the seed house, usually through overhead conveyors, for storage until transported to a cottonseed oil mill.

A screw or bucket type conveyor is usually used to convey seed to the seed scales. In moving cottonseed to the seed house, a screw conveyor, an airline, or a combination of these is used. All of these types of conveyors were used at gins in this study, but screw conveyors were most common, Appendix Table 1.

Factors Affecting Storage Period

Some gins, mainly those in the chute group, moved a large portion of the seed they purchased within 1 day after the seed entered storage, Appendix Table 2. Others kept a relatively large amount for over 3 weeks.

The most important factors, as reported by gin managers, affecting the length of time that seed were stored and the percentage of gins reporting each factor were: moisture content or shrinkage of seed, 65; price of seed, 47; storage space, 24; and hauling facilities, 21 per cent, Appendix Table 3.

Moisture and storage space were considered more important and price less important as factors influencing the period of storage at large volume gins than at small volume gins. Storage space affected length of storage to a greater extent at gins in the chute group than at gins in the fork and conveyor groups. Price was felt to be a more important factor at gins in the latter groups than at gins in the chute group.

Practically all seed were transported to oil mills in trucks, Appendix Table 4. Only 2 per cent were hauled by rail, the only other method used. Small volume gins used their own trucks to a

[1] The lint frequently passes through other machinery such as dryers and cleaners before and/or after being separated from the seed and before being baled.

greater extent than did large volume gins. The latter relied more heavily on trucks owned by oil mills and commercial haulers.

Other Uses of Cottonseed Storage Facilities

At 40 per cent of the gins included in the study, seed houses were used to store such items as feed, seed, fertilizer, poison, lumber, farm products, and farm machinery, as well as cottonseed, Appendix Table 5. The average length of time that seed houses were used other than for storing cottonseed was 4 months per year, but few gins utilized a very large portion of their total capacity. It is likely that these uses were incidental and were not considered when the houses were constructed. All costs of depreciation and interest on seed houses were allocated to cottonseed and none to other uses.

COSTS AND FACTORS AFFECTING COSTS

In order to reveal the over-all differences in costs of handling cottonseed at gins, the total costs per ton of seed handled were determined. These costs were then broken down into costs incurred prior to, during, and after storage, and were related to volume and method of loading cottonseed out of storage. Total costs were further broken down by cost items and their components to show the specific areas of differences.

Some practices and methods influenced costs; these are discussed in connection with the particular costs that they affected. It was thought that the type of ownership and financial relationship of gins to oil mills might influence costs indirectly. However, the analysis of records used in this study did not bear this out; there were no important differences in ownership or financial arrangements among different size and method groups, Appendix Tables 6 and 7.

Costs that were incurred before cottonseed entered storage were calculated on a per-ton ginned basis. However, only the seed that were purchased by the gin were subject to storage and further handling. Therefore, the costs incurred after the seed entered storage were based on the tons of seed purchased.

Relation of Total Costs per Ton to Volume and Method of Loading Out of Storage

The per-ton costs of handling cottonseed varied widely among gins having different volumes and even among gins having ap-

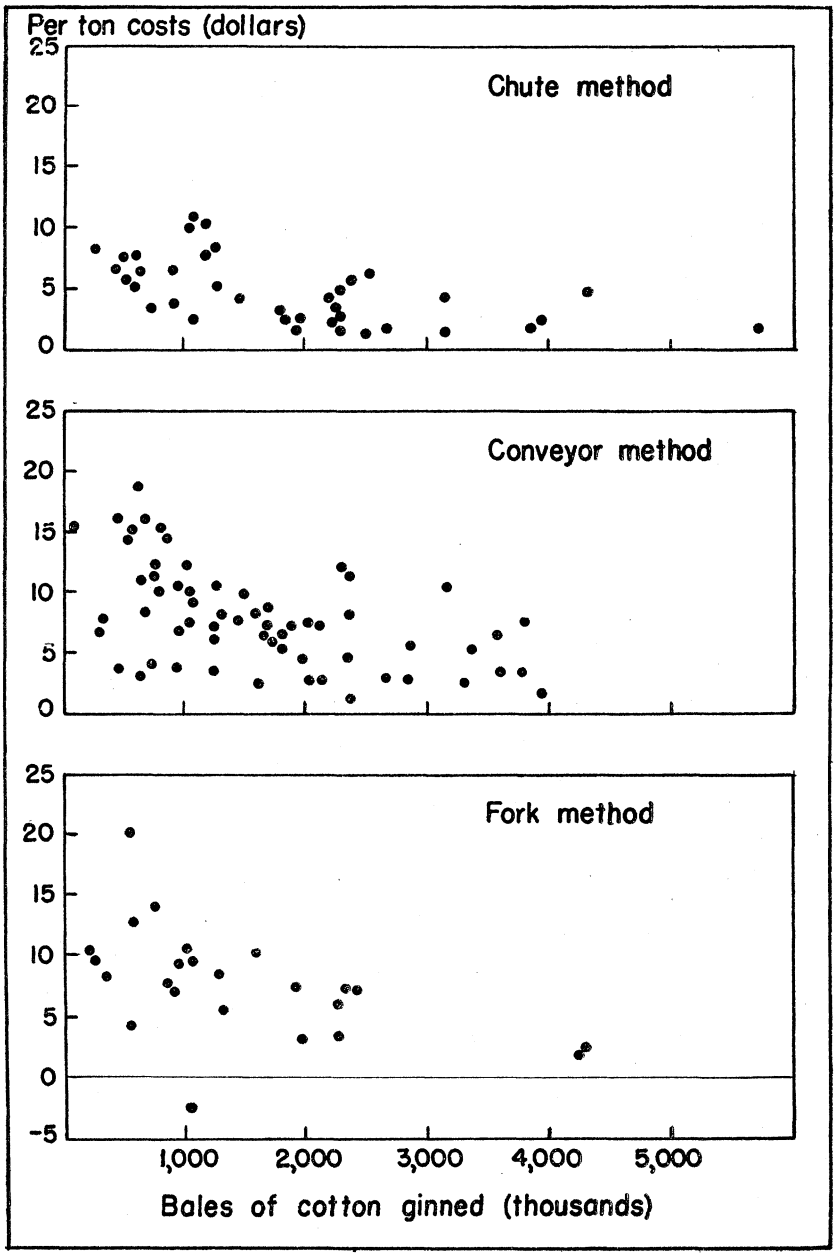

FIGURE 2. Bales of cotton ginned and per-ton costs of handling cottonseed, by method of loading cottonseed out of storage, Alabama, 1950 and 1951.

TABLE 2. WEIGHTED AVERAGE COSTS PER TON OF HANDLING COTTONSEED AT GINS, BY VOLUME OF COTTON GINNED AND METHOD OF LOADING COTTONSEED OUT OF STORAGE, 124 GINS, ALABAMA, 1950 AND 1951

Method and bales of cotton ginned	Before storage	During storage	After storage	Total
	Dol.	*Dol.*	*Dol.*	*Dol.*
Chute:				
Less than 1,000	3.79	1.94	0.05	5.78
1,000 - 1,999	2.78	1.64	.06	4.48
2,000 - 2,999	2.48	.77	.09	3.34
3,000 and over	1.95	.54	.08	2.57
ALL SIZES	2.47	.97	.08	3.52
Conveyor:				
Less than 1,000	4.33	5.33	0.55	10.21
1,000 - 1,999	3.23	3.46	.43	7.12
2,000 - 2,999	2.32	2.95	.45	5.72
3,000 and over	2.17	2.55	.31	5.03
ALL SIZES	2.81	3.26	.41	6.48
Fork:				
Less than 1,000	3.84	5.14	1.05	10.03
1,000 - 1,999	3.12	2.11	.42	5.65
2,000 - 2,999	2.27	3.10	.41	5.78
3,000 and over	1.13	.43	.60	2.16
ALL SIZES	2.56	2.54	.59	5.69

proximately the same volume, Figure 2. However, a general relationship between costs and volume did exist.

Total per-ton costs of handling cottonseed at the gins studied decreased within each method group with increases in volume of seed handled as indicated by the number of bales of cotton ginned. Absolute costs dropped more rapidly with increases in the number of bales ginned at low volumes than it did at high volumes. These relationships were further substantiated by the differences in the weighted average per-ton costs among the various groups, Table 2.

Costs incurred prior to[2] and during[3] storage accounted for the major portion of total costs in each size-method group. Labor in loading out of storage, the only costs incurred after storage, accounted for the remainder of total costs.[4] The magnitude of

[2] Includes costs of management; labor in weighing, bookeeping, and miscellaneous items; repair; taxes; power; telephone and office supplies; and interest on investment and depreciation excluding seed houses and portable conveyors.

[3] Includes costs of labor in moving cottonseed into and during storage, losses in weight of seed (difference in purchase and sale weights), interest on investment in and depreciation of seed houses and portable conveyors, insurance on cottonseed houses, and miscellaneous expenses such as bank exchanges and auditing.

[4] Depreciation and interest on investment in equipment used in loading out were very small and were included elsewhere. Costs of hauling were treated in a section separate from other costs.

costs before and during storage decreased with increases in volume in each method group. Costs of loading out did not vary inversely with volume in every instance. Also, they did not appear to have been as closely associated with volume as were costs prior to and during storage.

The costs per ton of seed handled varied rather widely among individual gins within each method group. However, the average costs at gins using the chute method were less than at gins using forks or conveyors to load cottonseed out of storage.[5] The weighted average cost of the chute group was $2.96 per ton less than, or only 54 per cent as great as, that of the conveyor group. There were little if any real differences in the total per-ton costs between gins using conveyor and fork methods.[6]

The greatest absolute differences in costs between the chute and other groups were in costs during storage. The largest percentage differences, however, were in costs of labor used in loading out of storage. Although the data showed the costs before storage to have been lowest in the chute group, the difference may have been unimportant due to the wide variation among gins in each method group.

Costs by Items

The items of greatest cost per ton were losses in weight of seed between purchase and sale dates, labor, management, depreciation, and interest on investment, Table 3. Labor and losses in weight accounted for about 60 per cent of total costs for the fork and conveyor groups and 38 per cent for the chute group. Losses in weight made up the highest costs at gins using forks and conveyors, while in the chute group these costs were exceeded by costs of both labor and management.

The general relationship between the costs of various items and volume was inverse for most items among gins within each method group. The most outstanding exception was in management costs at gins using the chute method. Within this method group, the costs of management per ton of seed handled increased as volume increased. Limited information revealed that the large volume gins of the chute group allocated a greater pro-

[5] The differences in average costs per ton among method groups were significant at the 1 per cent level (F test).

[6] The differences in average costs per ton between the fork and conveyor method groups were not significant at the 5 per cent level (F test).

TABLE 3. WEIGHTED AVERAGE COSTS PER TON, BY ITEMS, OF HANDLING COTTONSEED, BY VOLUME OF COTTON GINNED AND METHOD OF LOADING COTTONSEED OUT OF STORAGE, 124 GINS, ALABAMA, 1950 AND 1951

Method and bales of cotton ginned	Losses in weight	Labor	Management	Depreciation	Interest	Power	Repair	All other[1]	Total
	Dol.	*Dol.*	*Dol.*	*Dol.*	*Dol.*	*Dol.*	*Dol.*	*Dol.*	*Dol.*
Chute:									
Less than 1,000	0.81	1.25	0.37	1.26	0.65	0.53	0.18	0.73	5.78
1,000 - 1,999	.90	1.03	.56	.64	.38	.30	.15	.52	4.48
2,000 - 2,999	.46	.78	.68	.36	.22	.26	.26	.32	3.34
3,000 and over	.37	.56	.85	.25	.16	.11	.08	.19	2.57
ALL SIZES	.55	.80	.69	.46	.27	.24	.16	.35	3.52
Conveyor:									
Less than 1,000	4.01	1.77	1.36	1.06	0.56	0.35	0.50	0.60	10.21
1,000 - 1,999	2.46	1.72	.95	.69	.41	.23	.13	.53	7.12
2,000 - 2,999	2.17	1.46	.50	.54	.34	.17	.19	.35	5.72
3,000 and over	1.87	1.45	.35	.38	.24	.19	.17	.38	5.03
ALL SIZES	2.38	1.55	.71	.61	.36	.22	.21	.44	6.48
Fork:									
Less than 1,000	3.86	2.55	1.23	0.98	0.55	0.26	0.22	0.38	10.03
1,000 - 1,999	1.25	1.60	1.23	.59	.30	.25	.17	.16	5.65
2,000 - 2,999	2.82	1.18	.73	.35	.22	.23	.11	.14	5.78
3,000 and over	.34	1.10	.19	.16	.10	.21	.01	.05	2.16
ALL SIZES	1.94	1.57	.84	.50	.28	.24	.13	.19	5.69

[1] Includes taxes, insurance on seed houses, office supplies, telephone, and miscellaneous expenses such as auditing and bank exchanges.

portion of the manager's salary to cottonseed than did small volume gins, while in other groups the percentage of the manager's salary allocated to cottonseed varied very little with volume.

The costs of losses in weight of seed, labor, depreciation, and interest on investment were less for gins in the chute group than for gins in the other groups. Management costs averaged approximately the same for the chute and conveyor groups, with the fork group having somewhat higher costs. There were little if any real differences among method groups in costs of power. Costs of repair and "other" items were lower for the fork group than for other groups.

COSTS DUE TO LOSSES IN WEIGHT OF SEED[7]

Losses in weight of seed made up the highest cost items in the conveyor and fork groups and one of the highest in the chute group. Since these costs were so important from the standpoint

[7] In this study, losses in weight of seed refer to differences in purchase and sale weights. They refer to the actual losses due to shrinkage only when specifically stated.

of amount and varied with both method of loading out and volume, an attempt was made to delineate the factors responsible for these losses.

Losses in weight were reported in 98 of the 124 gin observations in 1950 and 1951, Table 4. The percentage of gins reporting such losses did not vary with volume. The fork method had the greatest and the chute method the smallest proportion of gins reporting losses in weight.

Four factors were reported by gin personnel as contributing to losses in weight of cottonseed handled, Table 5. Two of these, trash and dirt in seed cotton and method of determining purchase

TABLE 4. NUMBER OF GINS HAVING SPECIFIED LOSSES IN WEIGHT OF COTTONSEED, BY VOLUME OF COTTON GINNED AND METHOD OF LOADING COTTONSEED OUT OF STORAGE, 124 GINS, ALABAMA, 1950 AND 1951

Bales of cotton ginned and method of loading out	Gain	No gain or loss	Pounds of loss per ton of seed sold						Total
			50 or less	51-100	101-150	151-200	201-250	Over 250	
	No.	*No.*	*No.*	*No.*	*No.*	*No.*	*No.*	*No.*	*No.*
Less than 1,000	0	9	5	11	9	3	4	1	42
1,000 - 1,999	1	8	13	6	9	2	1	0	40
2,000 - 2,999	1	5	11	3	4	2	0	0	26
3,000 and over	1	1	10	3	0	0	1	0	16
Chute	0	14	17	5	2	0	0	0	38
Conveyor	2	7	16	10	17	4	6	0	62
Fork	1	2	6	8	3	3	0	1	24
ALL GINS	3	23	39	23	22	7	6	1	124

TABLE 5. NUMBER OF TIMES SPECIFIED CAUSES OF WEIGHT LOSSES WERE REPORTED BY GIN PERSONNEL, BY VOLUME OF COTTON GINNED AND METHOD OF LOADING COTTONSEED OUT OF STORAGE, 83 GINS,[1] ALABAMA, 1950 AND 1951

Bales of cotton ginned and method of loading out	Reasons for losses in weight				All reasons
	Shrinkage of seed	Waste in handling	Trash and dirt in cotton	Method of determining purchase weight	
	No.	*No.*	*No.*	*No.*	*No.*
Less than 1,000	13	4	8	10	35
1,000 - 1,999	17	10	9	7	43
2,000 - 2,999	13	9	6	4	32
3,000 and over	10	6	3	5	24
Chute	18	10	2	8	38
Conveyor	23	13	16	16	68
Fork	12	6	8	2	28
ALL GINS	53	29	26	26	134

[1] Other gins having losses in weight did not report.

weight of the seed, might well be combined, as the latter would, if accurate, eliminate the loss due to the former. Together, these two factors were reported by gin managers 52 times, shrinkage of seed 53 times, and waste in handling 29 times.

At gins in the two smallest volume groups and at gins using the chute method, the method of determining weight was considered to be more important and waste in handling less important than at gins with larger volumes and at those using other methods. Shrinkage of seed was listed more often than any other factor by gins using the chute method. The important problem to gin operators in reducing losses in weight is determining the extent that each of these factors affects their losses in weight.

The weighted average per-ton costs of losses in weight at gins that used seed scales to determine purchase weight were less than a fourth of that at gins using estimating formulas, Table 6. Use of seed scales was most prevalent among gins using the chute method and those with large volumes, and weight losses reported were least in these groups.

The differences among gins of different sizes and different methods of loading out of storage but using the same method of determining weight were not important statistically, and were small relative to the differences among gins using different methods of determining weight. Also, the relations of losses in weight to volume were not constant.

If shrinkage of seed had contributed to the differences in losses

TABLE 6. PER-TON COSTS OF LOSSES IN WEIGHT OF SEED ACCORDING TO METHOD OF DETERMINING PURCHASE WEIGHT, BY VOLUME OF COTTON GINNED AND METHOD OF LOADING COTTONSEED OUT OF STORAGE, 124 GINS, ALABAMA, 1950 AND 1951

Bales of cotton ginned and method of loading out	Method of determining purchase weight		
	Seed scales	Estimating formulas[1]	All methods
	Dollars	*Dollars*	*Dollars*
Less than 1,000	1.29	4.20	3.22
1,000 - 1,999	.86	3.03	1.77
2,000 - 2,999	1.02	3.42	1.52
3,000 and over	.48	4.16	1.04
Chute	.40	2.17	.55
Conveyor	1.06	3.92	2.38
Fork	1.41	3.06	1.94
ALL GINS	.79	3.59	1.63

[1] Seed cotton weight less gross weight of the bale; at some gins, an additional deduction expressed in pounds or as a percentage of seed cotton weight.

in weight, there should have been a direct relationship between costs of losses in weight and the length of time that seed were stored. That is, within limits, the longer the period of storage, the greater were weight losses and hence the greater were costs.

The results of plotting costs of losses in weight against the length of time that seed were stored at gins using seed scales to determine purchase weight indicated that there was no constant relationship between these two factors. This, in turn, indicated that shrinkage of seed was not an important factor in the costs of losses in weight and that it need not be considered in attempting to reduce such losses.

Other factors that might have affected the amount of losses in weight were waste in loading out and in hauling the seed to mills. The amount due to the latter was probably affected by distance transported, whether the seed were hauled in an open or a covered truck, and how full the truck was loaded. Apparently, distance was not of major importance because gins with least losses in weight, those in the chute and large volume groups, transported seed as far as or farther than did other gins, Appendix Table 8. The extent to which other factors affected the amount of seed losses could not be determined from the data available. It seemed that the amount lost would be rather small; however, these factors might have been of enough importance to account for some of the variation among method and size groups.

Labor

Of the six distinct operations that required labor, the cost of only two, loading out of storage and determining the weight of cottonseed, varied with volume, Table 7. There was little difference among size groups in costs of other labor items. Evidently, the decrease in costs of loading out of storage with an increase in volume was due to the fact that it required the same amount of time to get ready to load and to go from one job to another regardless of the amount of seed to be handled. This assumed that more than one truck was loaded out at one time and that larger volume gins loaded out more per time than did smaller volume gins. Determination of weight by seed scales probably required less time than did other methods. Seed scales were more common among large than among small gins. Also, when seed scales were used, a wage hand probably determined the weight; but when other methods were used, the manager or

TABLE 7. WEIGHTED AVERAGE LABOR COSTS PER TON OF COTTONSEED HANDLED, BY VOLUME OF COTTON GINNED AND METHOD OF LOADING COTTONSEED OUT OF STORAGE, 124 GINS, ALABAMA, 1950 AND 1951

Method and bales of cotton ginned	Moving seed			Bookkeeping[2]	Weighing[2]	Other[2]	Total
	Into storage[1]	During storage[1]	Out of storage[1]				
	Dol.	*Dol.*	*Dol.*	*Dol.*	*Dol.*	*Dol.*	*Dol.*
Chute:							
Less than 1,000	0.01	0.00	0.05	0.18	1.02	0.00	1.26
1,000 - 1,999	.01	.01	.06	.23	.63	.09	1.03
2,000 - 2,999	.00	.01	.09	.31	.37	.00	.78
3,000 and over	.00	.00	.08	.24	.24	.00	.56
ALL SIZES	[3]	.01	.08	.25	.44	.02	.80
Conveyor:							
Less than 1,000	0.07	0.04	0.55	0.42	0.70	0.00	1.78
1,000 - 1,999	.01	.16	.45	.16	.91	.05	1.74
2,000 - 2,999	.02	.16	.45	.35	.49	.00	1.47
3,000 and over	.00	.20	.31	.52	.42	.00	1.45
ALL SIZES	.02	.15	.41	.35	.61	.01	1.55
Fork:							
Less than 1,000	0.00	0.34	1.05	0.29	0.88	0.00	2.56
1,000 - 1,999	.00	.34	.42	.25	.60	.00	1.61
2,000 - 2,999	.00	.05	.41	.42	.30	.00	1.18
3,000 and over	.00	.01	.60	.14	.35	.00	1.10
ALL SIZES	.00	.18	.60	.27	.52	.00	1.57

[1] Costs calculated on a per-ton sold basis.
[2] Costs calculated on a per-ton ginned basis.
[3] Less than 0.005 dollar.

bookkeeper may have made the necessary calculations. The difference in wages paid these individuals may have accounted for part of the variation of these costs with volume.

Labor costs at gins using chutes were slightly over half the amounts of those using conveyors and forks. The major differences were in labor during storage and in moving seed out of storage although bookkeeping and weighing costs were somewhat lower for the chute group. The fork group incurred the greatest costs of all method groups in loading out of storage.

The data from this study do not show definitely that gins in the chute group had less seed in storage at a given time than did other gins, but the fact that their storage facilities were smaller and that their storage periods were shorter indicates this to have been the situation. These practices likely decreased the need to turn the seed to prevent damage due to heating and probably accounted for the lower labor costs during storage that were reported by gins in the chute group.

Depreciation

Depreciation costs were calculated by multiplying annual depreciation rates by the replacement value of the item being depreciated. Replacement values were obtained from the Stoneville Ginning Laboratory at Stoneville, Mississippi. Annual rates of depreciation used were machinery, 5 per cent; all-wood buildings, 5 per cent; wood-frame steel buildings, 4 per cent; and all-steel buildings, 3 per cent.

Costs of depreciation decreased as volume increased, Table 8. Larger volumes did not require a proportionate expansion of seed handling facilities. Hence, with large volumes the relatively fixed costs were shared by a greater number of tons of seed.

Each component of total depreciation costs varied inversely with size. Total depreciation costs at gins with volumes of over 3,000 bales ranged from less than a fifth to a third of that at gins with less than 1,000 bales. The same relationship existed between these groups for individual items of depreciation.

Table 8. Weighted Average Depreciation Costs per Ton of Cottonseed Handled, by Volume of Cotton Ginned and Method of Loading Cottonseed Out of Storage, 124 Gins, Alabama, 1950 and 1951

Method and bales of cotton ginned	Item				
	Cottonseed house	Machinery in gin house	Power plant	Other items[1]	Total
	Dollars	*Dollars*	*Dollars*	*Dollars*	*Dollars*
Chute:					
Less than 1,000	0.40	0.65	0.17	0.04	1.26
1,000 - 1,999	.26	.27	.07	.04	.64
2,000 - 2,999	.11	.17	.04	.04	.36
3,000 and over	.09	.11	.02	.03	.25
All sizes	.16	.21	.05	.04	.46
Conveyor:					
Less than 1,000	0.50	0.32	0.16	0.09	1.07
1,000 - 1,999	.32	.24	.07	.07	.70
2,000 - 2,999	.25	.20	.06	.04	.55
3,000 and over	.18	.13	.04	.03	.38
All sizes	.28	.20	.07	.05	.60
Fork:					
Less than 1,000	0.47	0.34	0.13	0.04	0.98
1,000 - 1,999	.26	.22	.07	.04	.59
2,000 - 2,999	.12	.16	.04	.03	.35
3,000 and over	.04	.10	.01	.01	.16
All sizes	.21	.20	.06	.03	.50

[1] Includes portable conveyors, office buildings, and miscellaneous equipment such as typewriters and safes.

TABLE 9. WEIGHTED AVERAGE CAPACITY OF COTTONSEED STORAGE FACILITIES AT GINS, BY VOLUME OF COTTON GINNED AND METHOD OF LOADING COTTONSEED OUT OF STORAGE, 124 GINS, ALABAMA, 1950 AND 1951

Method and bales of cotton ginned	Gins	Storage space		Tons of seed purchased	Percentage storage space is of tons purchased
		Total	Per gin		
	Number	*Tons*	*Tons*	*Tons*	*Per cent*
Chute:					
Less than 1,000	10	1,022	102	1,933	54
1,000 - 1,999	12	1,936	161	6,158	31
2,000 - 2,999	10	1,820	182	9,349	19
3,000 and over	6	1,674	279	9,597	17
ALL SIZES	38	6,452	170	27,037	24
Conveyor:					
Less than 1,000	21	4,204	200	4,173	101
1,000 - 1,999	21	7,670	365	10,422	74
2,000 - 2,999	12	5,304	442	9,980	53
3,000 and over	8	4,620	578	10,420	44
ALL SIZES	62	21,798	352	34,995	62
Fork:					
Less than 1,000	11	2,105	191	2,416	87
1,000 - 1,999	7	1,594	228	3,149	51
2,000 - 2,999	4	570	142	2,934	19
3,000 and over	2	165	82	2,962	6
ALL SIZES	24	4,434	185	11,462	39

The only component of total depreciation in which there was an important variation in per-ton costs among method groups was depreciation of the cottonseed house.[8] The reason for this difference was that storage space was less both absolutely and relative to volume at gins with chute-type houses than at other gins.

Gins in the chute group had a weighted average storage space of 170 tons per gin as compared with 185 and 352 tons for those in the fork and conveyor groups, respectively. The contrast was even greater when capacity was expressed as a percentage of cottonseed purchased.

In general, cottonseed storage capacity per gin varied directly with volume of cottonseed purchased, Table 9. However, volume of storage space increased less proportionately than did tons of cottonseed bought. Gins with small volumes and those with chute-type houses had much less storage space relative to volume of seed purchased than did other gins. In the future, gin operators might reduce their costs of handling cottonseed by utiliz-

[8] The difference in average costs of cottonseed house depreciation among method groups tested significant at the 5 per cent level (F test).

ing smaller storage houses than they now have. The two largest gins in the fork group had storage space equal to only 6 per cent of their total purchases, while that of the smallest gins in the conveyor group was 101 per cent of total purchases. This emphasizes the possibility of reducing storage costs by utilizing smaller seed houses.

Interest on Investment

Interest on investment was based on 4 per cent of the value of cottonseed handling facilities. The value was determined by subtracting from replacement value the percentage of depreciation as estimated by the gin personnel interviewed.

A comparison of the variations in interest costs, calculated at 4 per cent of value, with volume of ginnings and method of loading out of storage was important statistically. The previous discussion of depreciation costs partially explains the variations in interest costs.

Efficiency of Use of Cottonseed Handling Resources

Certain relations that existed between costs and methods of loading seed out of storage, volume of cotton ginned, and other practices have been pointed out. However, the costs of most items varied considerably among gins that had approximately the same volume, methods, and practices. Some gins having large volumes and using normally efficient methods and practices had higher costs than did other gins with lower volumes and generally inefficient methods and practices. Apparently, some managers were much more efficient in the use of cottonseed handling resources than were others. Thus, at some gins, improvements in the use of these resources may be the best opportunity of substantially reducing costs. This, of course, might be difficult and would require careful analysis of the entire business in order to determine the areas of operation where cost-reducing improvements might best be made.

Costs of Moving Cottonseed to Storage

Different methods of moving cottonseed from gin stands to storage were compared as to their effect on costs of selected items, Table 10. Items selected were those believed most likely to be affected by the method of moving seed to storage.

It cost an average of $0.26 per ton less to move seed by screw conveyors than by airlines. The difference in power require-

TABLE 10. NUMBER OF GINS AND COSTS OF DEPRECIATION AND INTEREST OF SELECTED ITEMS AND POWER PER TON OF COTTONSEED HANDLED, BY VOLUME OF COTTON GINNED AND METHOD OF MOVING COTTONSEED FROM GIN STANDS TO STORAGE, 124 GINS, ALABAMA, 1950 AND 1951

Method and bales of cotton ginned	Gins	Depreciation and interest		Labor	Power costs	Total costs
		Mach. in gin bldg.	Power plant			
	No.	*Dol.*	*Dol.*	*Dol.*	*Dol.*	*Dol.*
Screw conveyor:[1]						
Less than 1,000	21	0.86	0.18	0.07	0.17	1.28
1,000 - 1,999	19	.44	.07	.01	.13	.65
2,000 - 2,999	11	.34	.07	.02	.16	.59
3,000 and over	9	.19	.04	.00	.12	.35
ALL SIZES	60	.37	.07	.02	.14	.60
Airline:[1]						
Less than 1,000	21	0.65	0.41	----	0.54	1.60
1,000 - 1,999	12	.36	.19	----	.33	.88
2,000 - 2,999	8	.23	.08	----	.16	.47
3,000 and over	1	.27	.06	----	.10	.43
ALL SIZES	42	.37	.19	----	.30	.86
Other:						
Less than 1,000	0	----	----	----	----	----
1,000 - 1,999	9	0.56	0.17	----	0.41	1.14
2,000 - 2,999	7	.36	.12	----	.37	.85
3,000 and over	6	.21	.06	----	.25	.52
ALL SIZES	22	.35	.11	----	.33	.79

[1] Gins using bucket elevators in combination with these methods were included.

ments of the two methods accounted for almost the entire difference in cost. As estimated power requirements were least for screw conveyors, gins using them had lower costs of power, depreciation, and interest on investment in power plant than did other gins.[9] With the use of screw-type conveyors, some labor was required in moving seed to storage. It was necessary to clean this type of conveyor whereas the airline was largely self-cleaning.

The method of moving seed affected costs at gins with low volumes to a much greater extent than at gins with larger volumes. Since costs associated with power requirements were relatively small, the full effect of volume was attained at about 2,000 bales.

COSTS OF TRANSPORTING COTTONSEED TO OIL MILLS

Cottonseed were hauled to oil mills in gin-owned trucks from fewer than a third of the gins studied. In other instances, the seed were hauled in trucks owned by cottonseed oil mills or

[9] See Appendix B, p. 31 for method of allocating costs.

commercial haulers and complete cost data were not available in such instances. Hence, the cost of transporting cottonseed to oil mills was handled separately from other items.

It was a common practice for oil mills to either haul the cottonseed from the gin to the mill or to pay the gin a certain amount per ton of seed for loading out of storage and hauling. In order to make the cost data comparable to the data on oil mill allowances, only those gins where all of the seed were hauled in gin trucks were included.

TABLE 11. WEIGHTED AVERAGE TRANSPORTATION COSTS[1] AND OIL MILL ALLOWANCES PER TON OF COTTONSEED HAULED BY GIN-OWNED TRUCKS, BY VOLUME OF COTTON GINNED AND METHOD OF LOADING COTTONSEED OUT OF STORAGE, 47 GINS,[2] ALABAMA, 1950 AND 1951

Bales of cotton ginned	Chute		Fork		Conveyor		All gins	
	Cost	Mill allowance	Cost	Mill allowance	Cost	Mill allowance	Cost	Mill allowance
	Dol.	*Dol.*	*Dol.*	*Dol.*	*Dol.*	*Dol.*	*Dol.*	*Dol.*
Less than 1,000	3.38	2.14	2.90	2.46	3.35	2.26	3.13	2.34
1,000 - 1,999	4.55	4.04	3.32	2.60	2.65	1.83	3.76	3.12
2,000 - 2,999	2.87	3.12	6.26	2.65	3.38	1.90	3.72	2.83
3,000 and over	2.78	3.50	5.17	2.65	---	---	3.97	3.08
ALL SIZES	3.62	3.45	3.86	2.57	3.08	2.02	3.62	2.86

[1] Costs included were depreciation, interest on investment, other truck costs, and labor in loading out of storage and hauling.
[2] Includes data from 24 gins in 1950 and 23 gins in 1951.

Costs involved in transporting seed included depreciation and interest on investment in trucks; fuel, oil, repair, and other expenses on trucks; and the costs of labor involved in hauling. Although not a cost of transporting the seed, labor in loading out of storage was also included as it was included in the oil mill allowance and could not be separated therefrom.

Costs of operating trucks and of labor were actual costs. Interest and depreciation were based on 1953 replacement value of trucks as given by dealers.

At gins in all but two groups, hauling cottonseed in gin trucks resulted in costs per ton in excess of the oil mill allowance, Table 11. However, the reverse was true at some gins.

INSURANCE ON COTTONSEED

Fewer than half of the gins studied carried insurance on cottonseed, Appendix Table 9. The average cost of such insurance was $0.33 per ton. This cost varied with volume of seed handled.

Cottonseed handled at other gins was covered by insurance carried by cottonseed oil mills. Information on costs of this insurance was not obtained.

SUMMARY

About 90 per cent of the production of cottonseed, once a waste product, is now sold for crushing purposes. Thus, cottonseed are important as a source of income to cotton farmers and to ginners.

Ginners purchase practically all of the cottonseed that farmers sell for crushing purposes, and in turn sell these seed to oil mills. Costs of handling and delivering prohibit most farmers from selling cottonseed direct to oil mills.

The objectives of this study were to determine the most economical methods and practices affecting the costs of handling cottonseed at gins with a view of suggesting possible improvements that would lead to increased efficiency and lower costs.

Data pertaining to costs of handling cottonseed in 1950 and 1951 were collected from 62 Alabama gins and combined for analysis.

The methods of handling cottonseed are similar at all gins. The seed, after being separated from the lint, are weighed on overhead scales, if used, in determining the weight of the seed. If scales are not used, the seed are conveyed to a seed house for storage until transported to a cottonseed oil mill. Screw, bucket, and pneumatic conveyors are used in moving the seed from stands to storage with screw conveyors being most common.

Although per-ton costs of handling cottonseed varied widely among individual gins within the same size-method group, costs varied with volume and with method of loading cottonseed out of storage. In general, gins with large volumes and gins using the chute method of loading out incurred much lower costs than did those using forks and conveyors to load out.

Each of the major costs decreased as volume increased. However, the relationship between losses in weight of seed and volume was due primarily to differences in method of determining weight rather than to volume. The major effect of volume was upon costs of management, depreciation, and interest.

The major differences in costs among method groups was in labor in loading seed out of storage. The cost of loading out was

$0.30 per ton less for the chute group than for other groups. This method was much faster and virtually eliminated handling the seed manually.

Costs of constructing chute-type houses were a little higher than those of regular-type houses. However, within 2 years and with constant wage rates, the reduction in labor costs would more than offset the higher costs of constructing a 185-ton capacity house, the average capacity of gins in the fork group and slightly larger than the average of the chute group.

Losses in weight of seed, the major cost item, were due primarily to the method of determining purchase weight of the seed. Only about half of the gins reported using seed scales and over 90 per cent of all gins reported losses in weight. The cost at gins using seed scales, $0.79 per ton, was less than a fourth of the cost at gins using estimating formulas, $3.59.

Gins using conveyors to load cottonseed out of storage had larger seed houses than did gins of other method groups. Hence, the depreciation costs for gins in this group were higher than for gins in the chute and fork method groups.

The costs of transporting cottonseed to oil mills in gin trucks from gins where all seed were transported in this manner were as a whole greater than the allowance paid to gins by oil mills.

CONCLUSIONS

Costs of handling cottonseed at gins in Alabama likely can be reduced by increasing the volume of seed handled, using smaller houses, using chute-type houses, altering the method of determining the purchase weight of seed, or increasing the efficiency of the use of cottonseed handling resources.

Increasing the volume of seed handled means increasing the number of bales of cotton ginned, as farmers already sell practically all of their cottonseed, except that kept for their own use, to ginners. Gin operators have no control over cotton production. Therefore, if volume is to be increased at some gins, that at others must decline or some gins must go out of business. The trend in recent years has been toward larger volumes and fewer gins.

It has been shown that gins with more or better ginning equipment and services attract business away from those that are less adequately equipped. Frequently, improvements or additions of machinery which modernize ginning facilities are needed to improve services to farmers. When volume is increased in this man-

ner, however, per-ton costs may not decrease. Usually, it will change very little but the greater number of tons handled should increase total net returns.

As many gins are rather old, it appears that there is considerable opportunity for gins in Alabama to increase volume by modernization. This should be especially true with an increasing amount of mechanically-harvested cotton, the ginning of which requires a considerable amount of machinery in addition to that required for hand-picked cotton.

With prices used in this study, the labor saved in loading out of storage by chutes as compared with forks and conveyors would in 1 to 2 years equal the additional cost of constructing a chute-type house above that required to construct a house of the conventional, or regular type. In 10 to 15 years, it would exceed the entire cost of construction. Many gins, especially those with old, worn-out buildings, should find the use of chute-type houses very desirable.

Many gins have excessive storage facilities. They might reduce costs somewhat by the normal replacement of present seed houses with smaller ones. This assumes, of course, that adequate facilities for transporting seed to oil mills is available, and that the gin operator does not wish to speculate on seed prices, which would require holding the seed at the gin for a relatively long period of time.

Losses in weight of seed could be reduced by determining the adequacy of present methods used for determining the weight of seed purchased from farmers. The most adequate method would be the use of seed scales. The initial cost of seed scales ranges from about $1,500 to $3,500 depending upon the arrangement. The annual cost figured at 4 per cent interest and 5 per cent depreciation would be approximately $125 to $300. The average loss in weight at gins using seed scales was $2.80 per ton less than the average at gins using estimating formulas. Thus, a volume of 50 to 110 tons of seed would justify use of seed scales at prices used in this study. Most of the gins studied purchased more than 110 tons of seed.

The above conclusion is based on the assumption that the ginner pays farmers the same price for seed whether the amount is estimated or is weighed. Even if this is not true, the use of scales would likely place a gin in a better competitive position than the use of estimating formulas, unless the operator has an unusually high degree of accuracy in estimating.

At some gins, the greatest opportunity to lower costs of handling seed is by increasing the efficiency of use of cottonseed handling resources. This is evidenced by the wide variation in costs among gins of approximately the same size and using similar methods of handling.

Currently, many gin managers can expect to gain little by purchasing trucks for hauling seed. However, consideration of factors other than costs and oil mill allowances is necessary before making final decisions as to the desirability of transporting seed in a gin-owned truck. If other transportation facilities are available when needed, and if other phases of the gin business do not require a truck, in many instances, ownership and maintenance of a truck for seed hauling would be unprofitable. If this is not the situation, it may be profitable to transport seed in a gin truck even though costs exceed the oil mill allowance to some extent. This would be particularly true if other needs required the ownership of a truck.

Managerial decisions should not be based on costs alone. Consideration needs to be taken of the effects of any anticipated changes on the operating practices and net returns of the cottonseed enterprise and on the ginning business as a whole. The primary concern of gin managers and owners should be over-all net returns and not costs or returns of a single enterprise or phase of the business, except insofar as they affect total net returns. Individual gin organizations vary in structure, diversity of enterprises, and practices of various phases of the business.

Losses of moisture, or shrinkage of seed, were believed by ginners to be the most important factor affecting differences in purchase and sale weights. This was not substantiated by this study. Rather, the results indicated that it had little effect upon losses in weight during storage. Since the effects of shrinkage on weight losses were determined indirectly, there may exist a need for some additional study of the relation of weight losses to losses of moisture content during the storage of cottonseed at gins.

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APPENDIX

A. TABLES

APPENDIX TABLE 1. NUMBER OF GINS USING SPECIFIED METHODS OF MOVING COTTONSEED FROM GIN STANDS TO STORAGE, BY VOLUME OF COTTON GINNED AND METHOD OF LOADING COTTONSEED OUT OF STORAGE, 124 GINS, ALABAMA, 1950 AND 1951

Bales of cotton ginned and method of loading out	Method of moving seed to storage						All methods
	Airline	Screw conveyor	Screw conveyor and bucket elevator	Screw conveyor and airline	Airline and bucket elevator	Airline, screw, and bucket	
	No.	*No.*	*No.*	*No.*	*No.*	*No.*	*No.*
Less than 1,000	17	7	14	0	4	0	42
1,000 - 1,999	11	8	11	7	1	2	40
2,000 - 2,999	7	8	3	7	1	0	26
3,000 and over	1	7	2	6	0	0	16
Chute	6	16	4	6	6	0	38
Conveyor	22	8	20	10	0	2	62
Fork	8	6	6	4	0	0	24
ALL GINS	36	30	30	20	6	2	124

APPENDIX TABLE 2. PERCENTAGE OF COTTONSEED STORED AT GINS FOR SPECIFIED NUMBERS OF DAYS, BY VOLUME OF COTTON GINNED AND METHOD OF LOADING COTTONSEED OUT OF STORAGE, 124 GINS, ALABAMA, 1950 AND 1951

Method and bales of cotton ginned	Days stored						Total
	0	1	2-5	6-10	11-20	21 or more	
	Pct.	*Pct.*	*Pct.*	*Pct.*	*Pct.*	*Pct.*	*Pct.*
Chute:							
Less than 1,000	0	32	18	40	0	10	100
1,000 - 1,999	0	41	35	20	0	4	100
2,000 - 2,999	0	61	21	16	0	2	100
3,000 and over	0	48	48	3	0	1	100
ALL SIZES	0	50	33	14	0	3	100
Conveyor:							
Less than 1,000	0	5	31	10	6	48	100
1,000 - 1,999	0	6	37	20	14	23	100
2,000 - 2,999	10	4	39	24	6	17	100
3,000 and over	11	9	26	21	2	31	100
ALL SIZES	6	6	34	21	7	26	100
Fork:							
Less than 1,000	2	11	42	19	4	22	100
1,000 - 1,999	21	6	16	8	7	42	100
2,000 - 2,999	11	40	8	3	6	32	100
3,000 and over	26	48	26	0	0	0	100
ALL SIZES	16	27	22	7	4	24	100

APPENDIX TABLE 3. NUMBER OF TIMES SPECIFIED FACTORS AFFECTING PERIOD OF COTTONSEED STORAGE AT GINS WERE REPORTED BY GIN PERSONNEL, BY VOLUME OF COTTON GINNED AND METHOD OF LOADING COTTONSEED OUT OF STORAGE, 124 GINS, ALABAMA, 1950 AND 1951

Bales of cotton ginned and method of loading out	Moisture content of seed	Price	Storage space	Hauling facilities	Other	All factors
	No.	*No.*	*No.*	*No.*	*No.*	*No.*
Less than 1,000	26	26	6	11	2	71
1,000 - 1,999	25	20	10	9	9	73
2,000 - 2,999	19	9	9	4	3	44
3,000 and over	10	3	5	2	4	24
Chute	16	8	16	2	6	48
Conveyor	50	36	10	16	10	122
Fork	14	14	4	8	2	42
ALL GINS	80	58	30	26	18	212

APPENDIX TABLE 4. PERCENTAGE OF COTTONSEED TRANSPORTED FROM GINS TO OIL MILLS BY SPECIFIED METHODS, BY VOLUME OF COTTON GINNED, 124 GINS, ALABAMA, 1950 AND 1951

Bales of cotton ginned	Percentage of seed hauled by				
	Commercial trucks	Gin trucks	Mill trucks	Rail	All methods
	Per cent	*Per cent*	*Per cent*	*Per cent*	*Per cent*
Less than 1,000	29	71	[1]	0	100
1,000 - 1,999	40	49	10	1	100
2,000 - 2,999	47	35	16	2	100
3,000 and over	67	22	6	5	100
ALL SIZES	49	39	9	2	100

[1] Less than 1 per cent.

APPENDIX TABLE 5. NUMBER OF GINS USING COTTONSEED STORAGE FACILITIES FOR OTHER COMMODITIES AND LENGTH OF TIME USED, BY VOLUME OF COTTON GINNED, 124 GINS, ALABAMA, 1950 AND 1951

Bales of cotton ginned	Number of gins	Average number of months used
	Number	*Months*
Less than 1,000	15	4
1,000 - 1,999	18	4
2,000 - 2,999	12	5
3,000 and over	5	6
ALL SIZES	50	4

APPENDIX TABLE 6. TYPE OF OWNERSHIP, BY VOLUME OF COTTON GINNED AND METHOD OF LOADING COTTONSEED OUT OF STORAGE, 124 GINS, ALABAMA, 1950 AND 1951

Bales of cotton ginned and method of loading out	Number of gins owned by			All gins
	Partnerships	Individuals	Corporations	
	Number	*Number*	*Number*	*Number*
Less than 1,000	21	20	1	42
1,000 - 1,999	18	16	6	40
2,000 - 2,999	13	9	4	26
3,000 and over	4	7	5	16
Chute	12	18	8	38
Conveyor	30	24	8	62
Fork	14	10	0	24
ALL GINS	56	52	16	124

APPENDIX TABLE 7. NUMBER OF GINS HAVING SPECIFIED FINANCIAL RELATIONSHIP WITH COTTONSEED OIL MILLS, BY VOLUME OF COTTON GINNED AND METHOD OF LOADING COTTONSEED OUT OF STORAGE, 124 GINS, ALABAMA, 1950 AND 1951

Bales of cotton ginned and method of loading out	Type of financial relationship							All gins
	Mill owns		Mill finances			Seed contract with mill	None	
	Gin	Stock in gin	Operations	Plant	Plant and operations			
	No.	*No.*	*No.*	*No.*	*No.*	*No.*	*No.*	*No.*
Less than 1,000	0	0	4	3	1	2	32	42
1,000 - 1,999	3	1	0	1	2	3	30	40
2,000 - 2,999	2	1	1	0	1	0	21	26
3,000 and over	3	0	0	0	0	0	13	16
Chute	0	0	0	0	2	2	34	38
Conveyor	6	2	0	4	0	2	48	62
Fork	2	0	5	0	2	1	14	24
ALL GINS	8	2	5	4	4	5	96	124

APPENDIX TABLE 8. WEIGHTED AVERAGE DISTANCE COTTONSEED WERE HAULED FROM GINS TO OIL MILLS, BY VOLUME OF COTTON GINNED AND METHOD OF LOADING COTTONSEED OUT OF STORAGE, 124 GINS, ALABAMA, 1950 AND 1951

Bales of cotton ginned and method of loading out	Gin truck	Commercial truck	Mill truck	All trucks
	Ton miles	*Ton miles*	*Ton miles*	*Ton miles*
Less than 1,000	38	46	122	40
1,000 - 1,999	74	60	20	63
2,000 - 2,999	53	43	25	44
3,000 and over	56	38	24	41
Chute	69	53	40	60
Conveyor	65	43	27	49
Fork	15	16	19	16
ALL GINS	58	45	24	48

APPENDIX TABLE 9. COST OF COTTONSEED INSURANCE, BY VOLUME OF COTTON GINNED, 50 GINS, ALABAMA, 1950 AND 1951

Volume of cotton ginned	Number of gins	Seed sold	Insurance	
			Total	Per ton
	Number	*Tons*	*Dollars*	*Dollars*
Less than 1,000	13	2,910	1,449	0.50
1,000 - 1,999	19	9,372	3,884	.41
2,000 - 2,999	12	10,729	3,107	.29
3,000 and over	6	7,336	1,563	.21
ALL SIZES	50	30,347	10,003	.33

APPENDIX TABLE 10. POWER REQUIREMENTS USED TO DETERMINE PROPORTION OF POWER COSTS CHARGEABLE TO COTTONSEED[1]

Item	Horsepower requirements
Machinery used for handling cottonseed	
Screw conveyors	0.05 per linear foot of length plus 0.75 if elevating seed
Bucket elevators	2.5 each elevator
Fans for airlines:	
Over 5 inches in diameter—	
Utilizing seed cotton suction exhaust	20
Using separate fan	15
5 inches or less in diameter	7.5
Vacuum seed feeders	1.25 each
Machinery not used for handling cottonseed	
Suction fans, not blowing seed:	
40-inch	18
45-inch	22
Suction fans, blowing seed:	
40-inch	15
45-inch	15
Driers:	
24-shelf tower	40
Conveyor type	30
Stub tower	25
Gin stands:	
Air-blast type:[2]	
70-saw	4.5
80-saw	5
90-saw	6
Brush type:	
80-saw	9
90-saw	10
Bale press	12
Bur machine	10
Separator	5
Feeder distributor	5
Extractor feeder	1.5
Hull and dirt fans:	
30-inch	10
35-inch	12
Lint cleaner	15
Mote fans:	
18-inch	6
20-inch	8
40-inch	14
Overhead cleaners:	
52 inches in width	.75 per cylinder
72 inches in width	1.25 per cylinder

[1] Based on estimates obtained from gin manufacturing companies.

[2] Plus 18 and 22 hp. on three and four stands, respectively, to pull the air-blast fan.

B. Method of Calculating Costs

1. Actual costs:

Costs of the following items were actual costs to the gin as reported by gin operators:

Management involved in handling cottonseed
All labor items except loading out of storage
Repairs of cottonseed handling facilities
Insurance on cottonseed houses
Telephone and office supplies
Taxes
Bank exchanges
Miscellaneous items involved in handling seed

2. Derived costs:

a. Labor costs. Labor costs of loading out of storage were calculated at $0.75 per man hour.

b. Power costs. Gin operators reported costs of power for the entire gin plant. The method used to prorate these costs to cotton and cottonseed is outlined below.

Estimates of horsepower requirements of various items of gin equipment operated under average conditions were obtained from gin manufacturing companies, Appendix Table 10. Total power requirements of 18 gins in Alabama for which rather complete equipment data were available were calculated. The total requirements of these gins, 1,714 horsepower, were divided into the total number of horsepower available at these gins, 2,075. The quotient, 1.21, was the ratio of power available to average power required at these gins. That is, these gins were using power plants with a capacity equal to 121 per cent of the average estimated requirements.

Power requirements of the cottonseed handling machinery were calculated for each gin and adjusted to allow for excess power available by multiplying the requirements by 121 per cent. This adjusted horsepower requirement of each gin was then divided by the available horsepower. This figure represented the percentage of total power available that was used for handling cottonseed. This percentage of the total power costs reported by the gin operator was allocated to cottonseed.

c. Interest on investment and depreciation. These costs were based on 1953 replacement values in order to put all gins on a more comparable basis. Replacement value was the cost of purchasing or building new equipment identical to that in use minus the percentage of depreciation as reported by gin managers.

Depreciation and interest on investment in the power plant were prorated to cottonseed and lint on the same basis as was power cost. Where fans were used to blow seed and handle seed cotton, 55 per cent was charged to cottonseed. On other items used to handle cottonseed, all depreciation and interest were charged to cottonseed.