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Cotton Ginning

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THE TEXAS COTTON GINNING INDUSTRY



COTTON ECONOMIC RESEARCH

The University of Texas • Austin



Research Report No. 73

THE TEXAS COTTON GINNING INDUSTRY

Cotton Economic Research
The University of Texas
Austin, Texas

A Part of

The Cotton Research Committee of Texas

PREFACE

A questionnaire was sent to all Texas gins in December, 1963 relating to their 1963-64 ginning season. The results of this study would make it possible for the individual ginner to compare his own data with the average data for the area in which he was located and with other cotton growing areas and with the State as a whole.

The questionnaire returned such information as: Number of saws per stand, number of stands, year gin built, method of harvesting used on cotton being received by the gin, total number of employees, new gin equipment added to gin prior to the 1963-64 season and the cost, number of tower driers, etc. Over 400, or slightly over 30 per cent, of the questionnaires were returned and were used as the basis for this publication, along with any other data for earlier years which could be used as a comparison.

We wish to express our thanks to those gins who returned the questionnaires making this report possible. We also wish to express our appreciation to those who reviewed the manuscript and the many helpful suggestions and contributions in the preparation of this publication. Various publications of sections and divisions of the U. S. Department of Agriculture, the Bureau of Census of the U. S. Department of Commerce and the Texas Cotton Ginners Association were used in compiling this report.

COTTON ECONOMIC RESEARCH
Austin, Texas

TABLE OF CONTENTS

	Page
Introduction	1
Trends in Production	2
Trends in Equipment	
Driers and Cleaners	7
Moisture Controls and Automatic Samplers	11
Trends in Employment	14
Trends in Gin Output	16
Trends in Gin Stands	18
New Gins and Gin Modernization	28
Cost and Value	30
Summary	41

LIST OF TABLES

Number

1	Production by Crop Reporting Districts for Years Indicated	2
2	Per Cent of Active Gins in Texas by Crop Reporting Districts for Selected Years	4
3	Per Cent of Gin Plants Initially Built Between Years Indicated by Crop Reporting Districts	5
4	Total Number of Gins and Number of Active Gins by Crop Reporting Districts for Selected Years	6
5	Per Cent of Gins Having Seedcotton Driers by Crop Reporting Districts for Selected Years	8
6	Drier and Cleaning Equipment Data for Texas Gins by Crop Reporting Districts	9
7	Tandem Lint Cleaners by Crop Reporting Districts	10

LIST OF TABLES (Continued)

Number		Page
8	Percentage of Moisture Control and/or Restoration Systems by Crop Reporting District	12
9	Automatic Samplers by Crop Reporting Districts	13
10	Average Number of Employees per Gin by Crop Reporting District	15
11	Average Number of Bales Ginned Per Gin by Crop Reporting District for Selected Years	17
12	Average Number of Bales Ginned Per Gin for a 12-Hour Shift by Crop Reporting Districts for Selected Years . . .	19
13	Per Cent of Gins Having the Indicated Number of Gin Stands Per Gin for Selected Years	20
14	Average Number of Stands Per Gin by Crop Reporting Districts for Selected Years	21
15	Average Number of Bales Ginned Per Hour Per Stand by Crop Reporting Districts for Years Indicated	22
16	Average Number of Saws Per Gin by Crop Reporting Districts for Selected Years	24
17	Average Number of Saws Per Stand by Crop Reporting Districts for Selected Years	25
18	Average Number of Pounds of Lint Ginned Per Saw Per Hour by Crop Reporting Districts for Years Indicated	26
19	Per Cent of Gin Plants by Crop Reporting Districts Which Have Same Number of Saws for All Their Gin Stands as Indicated or Which Have Mixed Gin Stands	27
20	New or Remodeled Gins and Gins who Added New Equipment Prior to the 1963-64 Season	29
21	Texas 1963-64 Season Dollar and Cost Figures by Crop Reporting Districts in Thousands of Dollars	31
22	Texas 1963-64 Season Comparison of Average Data For Selected Factors by Gins According to Crop Reporting Districts	33

LIST OF TABLES (Continued)

Number		Page
23	Bales Per Dollar Value and Bales Per Employee for Crop Reporting Districts 1963-64 Season	35
24	Reasons for Increase or Decrease in Ginning Rate in 1963-64 Over Previous Season by Reporting Gins at End of Season	40

LIST OF FIGURES

1	State Total of Active Gins	3
2	Texas Average Charge for Ginning Bales and Average Number of Bales Ginned Per Gin for Selected Years Indicated . . .	45

INTRODUCTION

Cotton gins perform a service for their customers, the cotton farmers. So long as they continue to provide services and gin a sufficient volume of cotton they will remain in business. When the gin fails to perform the necessary and proper services for its customers, the customer will seek service elsewhere. Changes in varieties planted, cultural practices, harvesting methods and competition in the area cause a gin to change its number of employees, equipment and services rendered. When cotton production in an area declines, the gin must change to overcome the decline in business or cease operation or move.

This change can be seen in Texas as the number of gins in the eastern and southern part of the State has decreased over the years and the number of gins in the western part has increased as cotton production moves westward in the State and nation. The total number of gins in Texas has declined over the years since 1914 when the State had approximately 4,700 gins. Other trends are greater volume ginned over a shorter harvest season, increased plant and equipment costs and rapidly rising operation costs.

Current information in relation to the foregoing, plus comparisons and additional information, is to be found in this report which will point out the many and varied changes that have taken place and are still taking place in the Texas cotton ginning industry.

TRENDS IN PRODUCTION

Cotton production is dependent on gins being available to process the seedcotton into cotton lint and cottonseed. But the reverse is of more importance from the gin standpoint. In other words, gins will be built in areas of high production and will continue to exist and perform their service to the growers as long as the area will produce enough cotton to support their existence and only as long as the area does so.

For an improved picture of the production figures for selected years for the various crop reporting districts of Texas see Table 1 which shows the production in thousands of bales. From this table can be seen the

Table 1. PRODUCTION BY CROP REPORTING DISTRICTS FOR YEARS INDICATED
1,000 of Bales

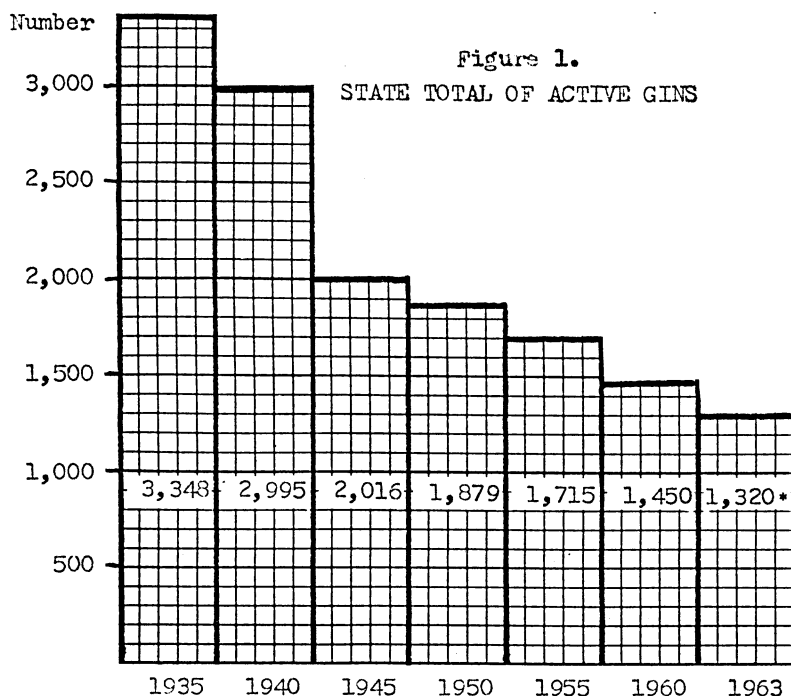
District	1935	1940	1945	1950	1955	1960	1963
1	350.5	438.9	116.5	810.2	1,391.8	1,955.5	2,102.4
2	607.0	504.3	368.2	548.0	522.3	722.1	595.6
3	108.3	65.4	17.4	14.7	16.5	15.5	15.5
4	723.8	831.1	568.0	556.8	627.5	446.3	501.1
5	407.5	491.8	114.6	123.7	229.2	119.4	131.7
6	37.1	74.7	76.4	144.4	278.1	272.3	261.0
7	77.0	62.2	26.0	47.1	26.0	53.6	29.1
8	342.0	308.2	220.6	229.8	221.6	264.1	219.6
9	105.4	214.8	102.5	120.8	220.3	104.8	212.1
10	91.2	121.3	126.8	350.5	423.4	391.2	317.0
State*	2,849.8	3,112.7	1,737.0	2,946.0	3,957.0	4,345.0	4,385.1

Source: USDA, AMS, Cotton Division

* State totals rounded off

changes that have taken place with respect to cotton production by areas. Sharpest increases occurred in Districts 1, 6 and 10, while the greatest decreases occurred in 3, 5 and 7. For further information on production, grades, staples and variety changes refer to Cotton Economic Research Reports No. 66 ("Changes as Related to Texas Cotton Production, Quality and Valuation," August, 1962), and No. 70 ("Trend and Future of Texas Cotton and By-Products").

Not only does the area production vary for the years shown, but the total production of the State varied. The number of active gins for these years was constantly decreasing. (See Figure 1 below.) The number of active gins during 1963 is estimated at slightly over 1,320 gins. Thus during the interval between 1935 and 1963, some two thousand Texas cotton gins fell by the wayside.



* 1963 Estimated
 Source: USDA, "Statistics on Cotton"

With this decrease in the number of active gins in the State, along with the shift of production, it is possible to rationalize these changes in production and gin location. By comparing Tables 1 and 2 it can be seen that the cotton gins are located where the cotton is produced; for without production, the modern high capacity gin cannot exist.

Table 2. PER CENT OF ACTIVE GINS IN TEXAS BY CROP REPORTING DISTRICTS FOR SELECTED YEARS

District	1935	1940	1945	1950	1955	1960	1963
1	7	9	9	16	21	28	29
2	12	12	14	14	13	13	13
3	3	3	2	1	1	1	1
4	26	26	30	26	24	21	21
5	20	19	15	11	9	6	5
6	1	1	1	3	4	5	5
7	2	2	2	2	2	1	1
8	17	17	16	13	13	11	11
9	5	5	5	5	5	6	5
10	4	3	4	9	8	8	9
Others - District Location Unknown	3	3	2	--	--	--	--
Total	100	100	100	100	100	100	100

Source: U. S. Department of Commerce, Bureau of the Census; USDA, AMS, Cotton Division and Texas Cotton Ginners Association

Based on the questionnaires returned, a table was constructed showing the per cent of gins built in Texas by year of construction and by crop reporting districts. (Table 3) Here again it is a fact that as the production increased in an area, the number of gins built in more recent years has also increased. Of the data received, District 7 is counter to this general trend because of the small number of gins located in the area and the fact that many have been rebuilt in recent years.

Table 3. PER CENT OF GIN PLANTS INITIALLY BUILT BETWEEN YEARS INDICATED BY CROP REPORTING DISTRICTS

District	1920- 1929	1930- 1939	1940- 1949	1950- 1959	1960 To Present	Total
1-N		4	4	70	22	100
1-S	2	7	27	40	24	100
2	7	7	12	59	15	100
3		33	34	33		100
4	21	18	15	33	13	100
5	20	13	13	47	7	100
6		5	15	70	10	100
7				50	50	100
8	17	6	28	35	14	100
9	37	11	11	37	4	100
10	18		36	46		100
10-A			36	32	32	100
State	12	10	19	43	16	100

Source: Original data (for those gins reporting at end of 1963-64 season)

To further indicate the changes that have occurred with respect to the total number of active gins versus total gins in the State by crop reporting districts, refer to Table 4 which gives data for part of the years referred to in the preceding tables. Again the same trend holds

Table 4. TOTAL NUMBER OF GINS AND NUMBER OF ACTIVE GINS BY CROP REPORTING DISTRICTS FOR SELECTED YEARS

District	1935		1940		1945		1963	
	Total	Active	Total	Active	Total	Active	Total	Active*
1-N	38	38	39	38	31	21	112	110
1-S	207	202	233	228	231	158	289	283
2	429	408	384	366	329	287	183	175
3	109	104	88	82	65	45	19	13
4	904	866	814	788	682	589	312	276
5	735	663	629	569	489	298	101	62
6	22	21	23	22	24	21	64	59
7	87	83	75	70	55	35	20	15
8	595	556	537	495	440	314	171	147
9	168	154	153	144	134	106	72	69
10	58	53	50	42	36	24	27	19
10-A	73	69	79	73	68	60	95	93
Others - District Location Unknown	139	118	103	75	66	38	--	--
State	3,564	3,335	3,207	2,992	2,650	1,996	1,465	1,321

* Based on those gins that reported at end of 1963-64 season.

Source: U. S. Department of Commerce, Bureau of Census and original data.

true. As production goes down and moves, so do the gin installations; for profit is the incentive of free enterprise and without cotton production in an area, the ginning operation is not profitable.

The slight difference between the number of total active gins for the various years in Table 4 and the bar graph on page 3 is the difference in the source of the data. One is the USDA and the other is the U. S. Department of Commerce, Bureau of the Census.

TRENDS IN EQUIPMENT

Driers and Cleaners

The last two decades have seen numerous changes in the cotton ginning industry. The number of gins decreased; and with the method of harvesting changing from hand to mechanical, the gins have added new and additional equipment in order to do a better and more efficient job. In 1945, about five per cent of the Texas crop was mechanically harvested and only 31 per cent of the total gins in the State had seedcotton driers as compared to 10 per cent in 1940. All gins returning their questionnaires reported that they had seedcotton driers during the 1963 season.

Driers have become increasingly important with the advent of mechanical harvesting. They aid in more efficient trash removal, faster ginning, reduced chokages and better grades. They also increase costs; and if not operated properly, they can cause quality damage. Table 5 shows the per cent of gins having seedcotton driers by crop reporting districts for the seasons of 1940, 1945 and 1963.

Table 5. PER CENT OF GINS HAVING SEEDCOTTON DRIERS BY CROP REPORTING DISTRICTS FOR SELECTED YEARS

District	1940	1945	1963
1-N	23	52	100
1-S	20	66	100
2	8	55	100
3	6	15	100
4	4	19	100
5	3	16	100
6	22	71	100
7	4	29	100
8	21	25	100
9	20	39	100
10	2	11	100
10-A	43	66	100
Others - District Location Unknown	4	11	--
State	10	31	100

Source: U. S. Department of Commerce, Bureau of the Census and original data.

In addition to the seedcotton driers, the gins have also added such cleaning equipment as stick and green leaf machines, bur machines, green boll traps and more efficient cylinder cleaners in an effort to remove the additional trash which is found in seedcotton delivered to the gin. Most of these changes to the cleaning system have taken place in the last two decades or less.

A few of the questions asked included: Number of tower driers? Number of shelves per tower? Number of other driers in the gin? Number of cleaning units per gin? Based on replies, it was determined that the average gin in the State has two tower driers or the equivalent. Fifty-five per cent of all the driers in Texas are tower types. There was an average of three seedcotton cleaning machines in each gin. For a more complete breakdown on this information by crop reporting districts see Table 6.

Table 6. DRIER AND CLEANING EQUIPMENT DATA FOR TEXAS GINS BY CROP REPORTING DISTRICTS

Dis- trict	Average Number Tower Driers Per Gin Plant	Tower Driers as Per Cent of All Driers Per Gin	Average Number Clean- ing Units Per Gin
1-N	1.7	58	3.9
1-S	2.4	41	3.1
2	2.2	46	3.5
3	1.0	80	2.7
4	1.4	70	3.4
5	2.9	34	3.2
6	1.4	73	3.6
7	1.3	80	3.2
8	1.5	67	3.1
9	1.4	71	2.6
10	1.8	55	2.6
10-A	1.8	54	3.1
State	1.9	55	3.3

Source: Original data (for those gins reporting at end of 1963-64 season)

Tandem lint cleaners are another innovation which came into being in the attempt to improve the grade of the ginned cotton and reduce the trash present in the lint which was increased because of mechanical harvesting. Table 7 shows the average number of tandem lint cleaners for those gins who reported having them and the per cent of gins so equipped by crop reporting districts of Texas. Some 52 per cent of the gins in the State who reported indicated they had tandem lint cleaners with an average of one and a half units per gin.

Table 7. TANDEM LINT CLEANERS BY CROP REPORTING DISTRICTS

District	Average Number Tandem Lint Cleaners Per Gin	Per Cent of All Gins Who Have Tandem Lint Cleaners
1-N	1.5	60
1-S	1.5	69
2	1.3	40
3	NA	NA
4	1.4	29
5	1.0	35
6	1.3	63
7	1.3	75
8	1.5	37
9	1.8	52
10	1.3	33
10-A	2.1	78
State Weighted Average	1.5	52

NA - Not Available

Source: Original data (for those gins reporting at end of 1963-64 season)

Moisture Controls and Automatic Samplers

Research has shown that the moisture content of seedcotton at the time of ginning is of major importance to quality preservation. As a result, moisture restoration and removal equipment and controls have been developed in order to more satisfactorily preserve the inherent quality of the cotton during processing and to obtain maximum bale values. At first many of these homemade devices were for adding moisture by use of water sprays or steam. In these early homemade types the operator had to watch his cotton closely, or the addition of too much moisture would result in a costly choke-up and objections from the trade.

Various manufacturers came into the field with different types of automatic or manual moisture control or restoration devices which can be installed in the modern gin to assure the proper moisture level in the cotton. Three of the questions asked were: Do you have a moisture control or restoration device in your gin? is it automatic or manual? and what per cent of the time is it in operation? The replies to these questions were used as the basis for developing Table 8 by crop reporting districts. Eighteen per cent of the ginners reporting indicated that they had "prefab or manufactured" moisture control or restoration devices in their gins and four per cent reported "other types." Of the prefab units, 64 per cent are automatic and 36 per cent are manually controlled. Of the other types of moisture and/or restoration units 32 per cent are automatic and 68 per cent have manual controls. The automatically controlled units are operated approximately 83 per cent of the time, and the manual type are in operation approximately 74 per cent of the time.

Table 8. PERCENTAGE OF MOISTURE CONTROL AND/OR RESTORATION SYSTEMS
BY CROP REPORTING DISTRICTS

Districts	Per Cent of Gins Having Units			Types of Control the Unit Has				Per Cent of Time the Units Are In Operation	
	Prefab* Units	Other** Units	All Units	Prefab Auto	Units Manual	Other Auto	Units Manual	Auto	Manual
1-N	23	16	39	67	33	25	75	81	64
1-S	38	10	48	52	48		100	77	74
2	4	2	6		100		100		11
3									
4	7	3	10	72	28	67	33	78	80
5	6		6	100				100	
6	48		48	55	45			73	78
7									
8	13	6	19	71	29	100		94	90
9									
10	8		8	100				100	
10-A	45		45	100				95	
State Average	18	4	22	64	36	32	68	82	74

*Prefab units - Jackson, Murray, France, etc. ** Other units - boiler, steam and homemade.

Source: Original data (gins reporting at end of 1963-64 season)

Note: Districts 3, 7 and 9 data not available.

The condition of American cotton bales upon their arrival at the mill door has long been a sore point in our cotton system. This has been particularly true in relation to the many sample holes that can often be found in both sides of a bale of cotton. These holes allow contamination of the cotton; thus creating loss, increased waste and increased fire hazards to all handlers. One means of eliminating these holes is through the use of the automatic sampler at the gin. One of the questions was: Do you have an automatic sampler? is it used? and what per cent of the time is it used? Table 9 shows this information by crop reporting districts for those gins who reported having an automatic sampler.

Table 9. AUTOMATIC SAMPLERS BY CROP REPORTING DISTRICTS
ALL DATA IN PER CENT

District	Gins With Automatic Samplers	Gins With Automatic Samplers Not in Use	Gins With Automatic Samplers In Use	Amount of Time Used
1-N	9	100*	--	--
1-S	15	56	44	97
7	25		100	100
8	2		100	85
9	5		100	100

* The fact that the trade would not accept the automatic sampler was the major reason reported by gins in this area.

Source: Original data (gins reporting at end of the 1963-64 season)

TRENDS IN EMPLOYMENT

Since 1945, when only five per cent of the cotton in Texas was mechanically harvested and 95 per cent hand harvested, we have come to nearly a full circle with the mechanically harvested cotton now at over 81 per cent and the hand harvested cotton down to less than 19 per cent.

The change to mechanical harvesting has been caused by the increased cost of hand harvest and the lack of workers when the need for them occurs. This change to mechanical harvesting has caused the installation of new and additional equipment in the gin with the result that the gin must, in most cases, employ more people now than before to handle the crop. An occasional exception to this is in some of the new automatic and semi-automatic high capacity plants. The gins reported their total number of employees during the 1963-64 ginning season in the questionnaire. On the basis of these gins reporting employee information, Table 10 was constructed according to the crop reporting districts. As a comparative figure, data gathered at the time of the gin moisture study conducted during the 1960-61 ginning season have been included for those crop reporting districts where the data was sufficient to be considered reliable.

Many of the employees who start the ginning season in the Lower Rio Grande Valley of Texas will move northward with the cotton harvest until they close the season on the High Plains of Texas. Ginners and gin employees move with the harvest season in much the same fashion as people involved in the wheat harvest of the United States. Many of the contractors who own and operate cotton pickers and strippers carry out the

same procedure of following the cotton harvest as it moves northward and westward in the State. As gins are modernized and become more complicated, the need for better trained employees and repair personnel arises.

Table 10. AVERAGE NUMBER OF EMPLOYEES PER GIN BY CROP REPORTING DISTRICTS

<u>District</u>	<u>1963-64</u>	<u>1960-61</u>
1-N	22.8	19.3
1-S	20.3	18.5
2	13.3	12.2
3	6.7	7.0
4	11.9	8.3
5	12.0	—
6	15.4	9.0
7	9.3	8.4
8	10.2	8.9
9	16.7	8.4
10	11.2	—
10-S	19.7	18.9
<hr/>		
State	15.4	—
<hr/>		

Source: Original data.

Note: The 1963-64 season is based on those gins reporting at the end of the season, while the 1960-61 season is based on data collected at the time of the gin moisture study during the season.

TRENDS IN GIN OUTPUT

The number of bales that a cotton gin handles during a season is dependent on several factors such as: The number of competitive gins in the same area, the cotton acreage and variety planted by the farmers in the area, the quality and kind of services that the gin performs for its customers, the training and skill of the employees, the charges that are made for ginning and the weather conditions during the growing and harvesting season. Variation in any of these will affect the number of bales ginned during any given season.

In some of the cotton growing areas in Texas the number of gins has decreased in proportion to production; thus, the remaining plants have had to increase their volume. The increased cost of operation and cost of new equipment to meet the needs of the changing conditions of the cotton delivered to the gin has made increased volume mandatory if the gins were to stay in business. The following is an indication of this change in ginning volume. Shown are percentage change, either decrease or increase, during the five-year interval from the 1956-57 crop year to the 1961-62 crop year according to the plants which gin a specified number of bales annually.

Gin Groupings According to Volume Ginned Annually	Interval of 1956-57 to 1961-62 Change During Period in Per Cent	
less than 500 bales	Decreased	68 per cent
501 - 1,500 bales	Decreased	43 per cent
1,501 - 2,500 bales	Increased	5 per cent
2,501 - 5,000 bales	Increased	30 per cent
5,001 - 10,000 bales	Increased	114 per cent
10,000 bales and over	Increased	191 per cent

Calculated from USDA, AMS, Cotton Division data

During the same period Texas had a decrease in the total number of active gins of over 10 per cent. This loss of ten per cent in the total number of gins was because of the low volume of 1,500 bales and less.

The average number of bales ginned per gin by crop reporting districts for various selected years is shown in Table 11, along with the State average for the years.

Table 11. AVERAGE NUMBER OF BALES GINNED PER GIN BY CROP REPORTING DISTRICTS FOR SELECTED YEARS

District	1935	1940	1945	1950	1955	1960	1963
1	1,460	1,650	638	2,755	3,792	4,938	4,789
2	1,488	1,378	1,266	2,188	2,311	3,924	3,330
3	1,041	797	253	710	717	912	1,142
4	835	1,055	973	1,127	1,512	1,478	1,962
5	615	864	336	606	1,538	1,372	2,065
6	1,764	3,396	3,295	2,533	4,030	4,255	4,420
7	927	889	638	1,624	928	2,978	2,458
8	615	618	705	912	976	1,651	1,582
9	684	1,492	909	1,404	2,475	1,379	3,887
10	748	1,056	1,514	2,124	3,136	3,402	2,989
State	854	1,040	870	1,568	2,290	3,062	3,202

Source: Calculated from USDA, AMS, Cotton Division; U. S. Department of Commerce, Bureau of the Census; and original data.

This proves conclusively that as volume decreased, the number of gins follows suit. The 1940 average shows the effect of a large crop which was larger than both of those for 1935 or 1945. The crop of 1945 was

smaller than the 1935 crop, but the increased volume was due to the decrease in the number of gins. Refer to Table 1 for the crop production figures on the crop years shown in Table 11. The volume for the remainder of the crop years shown had a slight increase in production over each of the preceding years. The State average for the years indicated is a weighted average according to the number of gins in the various crop reporting districts.

Rate of ginning can be expressed in bales per hour, per day, or per twelve hour shift. The gins were asked to report their hourly ginning rate in the questionnaires for the 1963-64 season. The hourly average ginning rate was converted to a 12-hour ginning rate and compared with equivalent data for the years of 1940 and 1945 by crop reporting districts of Texas. This information is found in Table 12, along with the weighted State average for the years concerned. Here again, the large producing areas of the State with their more modern gins are found to have the highest ginning rates. It is interesting to note that Crop Reporting Districts 1-N, 7 and 10-A have doubled or nearly doubled their ginning rate from 1940 to 1963. Some of the crop reporting districts had a decline in their ginning rates from 1940 to 1945. This could be misleading unless one remembers that the 1945 crop was 45 per cent below the 1940 crop.

TRENDS IN GIN STANDS

In recent years the search for more volume and increased plant capacity has resulted in the major redesign of gin stands and many other improvements. The modern day gin stand has much greater ginning capacity

Table 12. AVERAGE NUMBER OF BALES GINNED PER GIN FOR A 12-HOUR SHIFT BY CROP REPORTING DISTRICTS FOR SELECTED YEARS

District	1940	1945	1963*
1-N	45.0	45.8	90.0
1-S	50.5	51.6	79.2
2	48.6	48.9	69.6
3	39.5	39.9	46.8
4	48.9	47.0	56.4
5	40.5	42.6	57.6
6	44.2	42.4	66.0
7	39.6	42.0	82.8
8	47.4	44.9	68.4
9	47.2	45.7	67.2
10	46.8	48.9	64.8
10-A	51.5	53.1	91.2
Others - District Location Unknown	36.8	37.7	--
State	46.1	46.1	70.8

* Based on gins that reported at the end of the 1963-64 season.
Source: U. S. Department of Commerce, Bureau of the Census
and original data.

than its predecessor. This has been made possible through changing saw size, increasing the saw speed and other improvements. To give some idea as to what has taken place in connection with the number of gin stands in Texas gins, Table 13 was constructed from previous data for the crop years of 1940 and 1945; and the 1963 data are on the basis of the questionnaires returned.

Table 13. PER CENT OF GINS HAVING THE INDICATED NUMBER OF GIN STANDS PER GIN FOR SELECTED YEARS (DATA IN PER CENT)

DISTRICT	YEAR	1-2	3	4	5 or more	TOTAL
1-N	1940	-	3	51	46	100
	1945	-	3	39	58	100
	1963	9	9	35	47	100
1-S	1940	-	1	45	54	100
	1945	-	*	46	54	100
	1963	2	11	32	55	100
2	1940	*	1	31	68	100
	1945	-	*	35	65	100
	1963	-	6	50	44	100
3	1940	2	9	58	31	100
	1945	2	12	58	28	100
	1963	-	-	67	33	100
4	1940	1	2	48	49	100
	1945	1	2	50	47	100
	1963	5	10	57	28	100
5	1940	10	27	45	18	100
	1945	8	25	49	18	100
	1963	6	6	65	23	100
6	1940	-	4	26	70	100
	1945	-	5	16	79	100
	1963	-	-	41	59	100
7	1940	-	19	51	30	100
	1945	-	18	51	31	100
	1963	-	50	25	25	100
8	1940	3	13	37	47	100
	1945	1	15	38	46	100
	1963	-	8	46	46	100
9	1940	4	8	44	44	100
	1945	2	9	44	45	100
	1963	-	4	65	31	100
10	1940	-	4	40	56	100
	1945	-	3	36	61	100
	1963	-	9	27	64	100
10A	1940	2	-	49	49	100
	1945	1	1	55	43	100
	1963	5	5	28	62	100
STATE	1940	3	10	44	43	100
	1945	3	9	45	43	100
	1963	3	8	46	43	100

*Less than .5%

SOURCE: 1940 and 1945 U.S. Department of Commerce, Bureau of Census
1963 Original Data from gins reporting at end of 1963-64

On the basis of the total number of gin stands in Texas it is noted that the number has decreased over 60 per cent from 1935 to 1963.

1935 - 16,090 stands 1945 - 11,855 stands
 1940 - 14,379 stands 1963 - 6,343 stands*

* Estimated on basis of reporting gins at end of season.

Source: U. S. Department of Commerce, Bureau of the Census and original data.

Table 14 contains the average number of gin stands per gin plant by crop reporting districts for the years 1935, 1940, 1945 and 1963. The

Table 14. AVERAGE NUMBER OF STANDS PER GIN BY CROP REPORTING DISTRICTS FOR SELECTED YEARS

District	1935	1940	1945	1963*
1-N	4.6	4.5	4.6	4.5
1-S	4.7	4.6	4.6	4.4
2	5.0	4.9	4.9	4.3
3	4.4	4.2	4.1	4.3
4	4.9	4.8	4.7	4.1
5	3.7	3.7	3.8	4.1
6	4.7	4.5	3.8	4.8
7	4.2	4.1	4.1	3.8
8	4.8	4.7	4.6	4.4
9	4.6	4.6	4.6	4.3
10	4.6	4.7	4.7	4.7
10-A	4.8	4.6	4.4	4.5
Others - District Location Unknown	3.6	3.8	3.9	--
State State	4.5	4.5	4.5	4.3

* Based on gins that reported at end of 1963-64 season.

Source: U. S. Department of Commerce, Bureau of the Census and original data.

number of gin stands per plant has decreased on the basis of the average figures for almost all districts. This has been due to the faster ginning rate.

This increased capacity can be further seen by examining Table 15 which shows the average number of bales ginned per hour per stand according to crop reporting districts for the crop years 1940, 1945 and 1963. Also shown is the per cent of increase that has taken place when the figures for 1963 are compared with those for 1940.

Table 15. AVERAGE NUMBER OF BALES GINNED PER HOUR PER STAND BY CROP REPORTING DISTRICTS FOR YEARS INDICATED

District	1940	1945	1963*	Per Cent Increase in 1963 Over 1940
1-N	.822	.826	1.667	103
1-S	.913	.935	1.500	64
2	.816	.837	1.349	65
3	.786	.805	.907	15
4	.854	.830	1.146	34
5	.919	.921	1.171	27
6	.822	.921	1.146	39
7	.805	.854	1.186	47
8	.830	.804	1.295	56
9	.848	.826	1.302	54
10	.830	.872	1.149	38
10-A	.935	1.000	1.689	81
State	.853	.854	1.372	61

* Based on gins that reported at end of 1963-64 season.
Source: Calculated from U. S. Department of Commerce, Bureau of the Census and original data.

To arrive at this average hourly ginning rate per stand, the average hourly ginning rate per gin according to reporting districts was divided by the average number of gin stands per plant. Example: If the average hourly ginning rate were 4.1 bales per hour and the average number of stands per gin were 4.7, then the average hourly ginning rate per gin stand would be 4.1 divided by 4.7, which equals .8723 bales per hour per stand.

The average number of saws per gin does not show a marked increase until 1963 when compared with some of the earlier figures. The average number of saws per gin by crop reporting districts for selected years is found in Table 16. By comparing the years of 1935, 1940 and 1945 with each other, the changes that came about as the number of gins decreased or increased can be seen. For the most part, many of the districts had a decrease in the average number of saws per gin during these years. When compared with the 1963 season, it is noted that during the more recent years there was an increase in the average number of saws per gin. This, compared with the decrease in the average number of stands per gin over the years, indicates that the number of saws per stand has increased (Table 17).

Early average figures for the State indicated that there were 75 saws per stand. The large change occurred during the intervening years from 1945 to 1963; as the State average went from 76 in 1945, then to 88 saws per stand in 1963. This was caused by the installation of new high capacity stands which may have more saws per stand than those used in Texas gins a decade or two before. Even the newer stands with the

Table 16. AVERAGE NUMBER OF SAWS PER GIN BY CROP REPORTING DISTRICTS FOR SELECTED YEARS

District	1935	1940	1945	1963*
1-N	345	337	353	436
1-S	362	360	361	399
2	378	377	375	377
3	321	312	311	344
4	366	360	358	345
5	271	278	287	337
6	359	343	293	400
7	313	313	314	350
8	351	346	342	375
9	342	348	338	354
10	348	352	349	382
10-A	363	353	341	397
Others - District Location Unknown	268	283	292	—
State	337	338	340	378

* Based on gins that reported at end of 1963-64 season.

Source: U. S. Department of Commerce, Bureau of the Census and original data.

same number of saws as those previously used have increased their capacity through design changes, improved engineering developments and increased speeds.

Table 17. AVERAGE NUMBER OF SAWS PER STAND BY CROP REPORTING DISTRICTS FOR SELECTED YEARS

District	1935	1940	1945	1963*
1-N	75	75	77	97
1-S	77	78	78	91
2	76	77	76	88
3	73	74	76	80
4	75	75	76	84
5	73	75	76	82
6	76	76	77	83
7	74	76	77	92
8	73	74	74	85
9	74	76	75	82
10	76	75	74	81
10-A	76	77	76	88
Others - District Location Unknown	74	74	75	—
State	75	75	76	88

* Based on gins that reported at the end of the 1963-64 season.

Source: U. S. Department of Commerce, Bureau of the Census and original data.

To indicate this change more vividly in relation to what has happened to the gin saws over the past two decades, one needs only to look at the comparison of the number of pounds of cotton ginned per hour per saw by crop reporting districts. The State average figure for the years of 1940 and 1945 is found to be 5.6 pounds of lint ginned per saw per

hour while in 1963 this figure increased to 7.8 pounds of lint ginned per hour per saw. This information along with the figures for the same years by crop reporting districts is to be found in Table 18. Also shown is the percentage of increase that occurred when comparing 1963 with 1940. This increase on the basis of the State figures alone indicates the average was up some 39 per cent.

Table 18. AVERAGE NUMBER OF POUNDS OF LINT GINNED PER SAW PER HOUR BY CROP REPORTING DISTRICTS FOR YEARS INDICATED

District	1940	1945	1963	Per Cent Increase in 1963 Over 1940
1-N	5.5	5.4	8.6	56
1-S	5.9	6.0	8.2	39
2	5.3	5.5	7.7	45
3	5.3	5.3	5.7	8
4	5.7	5.5	6.8	19
5	6.1	6.1	7.1	16
6	5.4	6.0	6.9	28
7	5.3	5.5	9.9	87
8	5.6	5.4	7.6	36
9	5.6	5.5	7.9	41
10	5.5	5.9	7.1	29
10-A	6.1	6.6	9.6	57
State	5.6	5.6	7.8	39

Calculated from U. S. Department of Commerce, Bureau of the Census and original data.

Most of the gins reporting at the end of the 1963-64 ginning season indicated that all of their gin stands had the same number of saws per stand; the most common were the 80- and 90-saw plants. Only six per cent of the gins reporting stated that they had mixed gin stands or stands with a different number of saws in the same plant. The per cent of gin stands according to the number of saws per stand by crop reporting districts was calculated for those gins who reported on the questionnaires. This information is found in Table 19.

Table 19. PER CENT OF GIN PLANTS BY CROP REPORTING DISTRICTS WHICH HAVE SAME NUMBER OF SAWS FOR ALL THEIR GIN STANDS AS INDICATED OR WHICH HAVE MIXED GIN STANDS

District	70	80	90	100	120	177	Others*	Mixed	Total
1-N		23	33		4	14	17	9	100
1-S		39	32	5	10	1	1	12	100
2	2	34	39	6	4		4	11	100
3		100							100
4	4	50	36	1	2	1	6		100
5	12	53	35						100
6		36	54				5	5	100
7		25			25		25	25	100
8	15	35	41		3	2	2	2	100
9	14	36	42				4	4	100
10	10	60	30						100
10-A		31	13		4	4	21	27	100
State	5	40	35	2	4	2	6	6	100

* 75, 79, 88 or 140 saws to the stand, not mixed

Source: Original data (for those gins reporting at the end of the 1963-64 season)

NEW GINS AND GIN MODERNIZATION

The continued increase in the amount of Texas cotton being harvested mechanically means that the actual ginning season is being reduced. This results in the need to gin more cotton in a shorter period of time with the added problem that the cotton being received by the gin requires more attention in order to maintain the same quality in the cotton lint turned out by the gin plant. To overcome this the Texas gin has been required to increase its cleaning and ginning rate. This requires the modernization of the present plant or the building of a new gin.

The installation of new equipment may vary from a couple of thousand dollars up to 50 or 60 thousand dollars. Rebuilding a gin may run from 70 to over 100 thousand dollars. A new modern gin may run from over 100 thousand dollars to nearly half a million dollars depending on the size and elaborateness of the plant.

The equipment added or replaced for the most part may include gin stands, feeders, lint cleaners, new or more cleaning equipment, moisture control devices, fans and duct work, and condensers as well as buildings and offices. The gin questionnaire contained a question asking if any new equipment had been added to the plant prior to the 1963-64 season. They were also asked if the installation of the new equipment increased their ginning rate over the previous season. Based on those gins which reported at the end of the 1963-64 season, Table 20 was constructed to show the per cent of gins which added new equipment, whether their rate of ginning was improved, and the per cent of new or rebuilt gins.

Table 20, NEW OR REMODELED GINS AND GINS WHO ADDED NEW EQUIPMENT
PRIOR TO THE 1963-64 SEASON

District	Gins which Added New Equipment	Rate of Ginning Increased - Yes	Rebuilt or New Gins
1-N	48	100	12
1-S	65	93	2
2	46	74	4
3			
4	43	86	2
5	29	100	
6	52	75	
7	75	100	
8	36	80	
9	36	88	4
10	42	100	
10-A	64	78	9
State Average	47	86	3

Source: Original data (for thos gins reporting at the end of
the 1963-64 season)

The State average for the per cent of gins adding new equipment, based on those gins reporting, was found to be 47 per cent with 86 per cent of those who reported such addition of new equipment obtaining an increase in their ginning rate. For those gins reporting in the State, an average of three per cent indicated rebuilding or building of new gins.

COST AND VALUE

In addition to determining the amount of new equipment added prior to the 1963-64 season, also ascertained was the cost of the new equipment added. The cost of new or rebuilt gins, the value of the gins and the average cost for ginning charged per bale including bagging and ties were also asked. The average value of the Texas gins during the 1963-64 season was determined to be 147,000 dollars based on the gins who replied to the questionnaire. Thus, the estimated value of all gins in Texas during the 1963-64 season was over 198 million dollars. This information can be found according to the crop reporting districts of Texas in Table 21.

For those gins who reported having added new equipment the average cost of such new equipment added amounted to some 15,400 dollars per gin. The average cost in Texas for those gins who reported being rebuilt or reported as new gins amounted to 120,800 dollars per gin. This equipment added, rebuilding of gins and cost of new gins amounted to some 3.8 million dollar investment by gin owners. This information can also be found in Table 21 for the various crop reporting districts as applicable.

In this same table can be found a column showing the total cost of ginning. This was calculated on the basis of the production in the area involved and the average cost of ginning charged per bale including bagging and ties for the area considered. Also included is the crop reporting districts 1963-64 season estimated cotton lint valuation. The Texas 1963-64 season lint cotton value was estimated at some 704 million dollars. Processing cost for this cotton was an estimated 77.9 million dollars.

Table 21. TEXAS 1963-64 SEASON DOLLAR AND COST FIGURES BY CROP
REPORTING DISTRICTS IN THOUSANDS OF DOLLARS

District	Average Value Per Gin	Value* of All Gins Per Area	Average Cost of New Equipment Added Per Gin**	Average Cost Per Gin, New or Rebuilt**	Total Cost Per Area, New Equipment, New or Rebuilt Gin	Total* Cost of Ginning Per Area 1963-64	Value* Lint 1963-64 Season
1-N	227.2	25,442.7	22.7	165.0	744.5	9,351.2	78,768.1
1-S	195.2	56,020.4	16.8	149.0	789.2	29,146.7	263,701.9
2	131.4	23,528.6	15.1	70.0	396.4	10,280.9	92,566.0
3	122.5	1,592.5	--	--	--	277.2	2,358.0
4	95.2	26,556.6	12.6	115.0	720.8	8,928.9	77,353.0
5	77.2	5,090.5	28.2	--	141.0	2,054.3	17,259.0
6	185.2	10,929.0	16.8	--	218.5	4,391.8	45,198.0
7	184.2	3,316.5	25.4	--	50.9	439.4	5,326.0
8	124.8	18,599.4	9.5	--	151.6	3,720.6	34,773.8
9	94.5	6,523.3	15.1	100.0	185.5	3,274.5	35,955.0
10	104.3	2,085.7	8.2	--	24.6	705.2	7,266.7
10-A	195.8	18,407.0	13.1	107.5	397.7	5,197.1	43,549.7
State ^{1/}	147.3	198,092.2	15.4	120.8	3,820.7	77,947.8	704,075.2

* Estimated ** Based on only those gins which added new equipment, are new or rebuilt gins.

^{1/} State is a weighted value.

Source: Original data.

To indicate the magnitude of the ginning industry, and its importance to Texas, consider some of these cost and value figures in relation to the population of Texas. The 1960 Texas population census was reported to be 9,579,677; adding the anticipated increase gives an estimated population figure for 1963 of 10,319,643. The investment represented by gin plant value amounts to some \$19.00 per capita for Texas, while the cost of new equipment, new and rebuilt gins amounts to \$.37 per person. The value of the 1963-64 season lint cotton amounts to some \$68.22 per person in Texas. When the value of the cottonseed produced is included, this figure increases to \$77.45 per capita for Texas. When the total cost of ginning the crop is figured on a per capita basis for Texas the figure amounts to \$7.55 per person.

The questionnaire also asked for the cost of ginning charged for the season, along with the number of bales ginned, the hourly ginning rate, the number of bales required to be ginned to break even and the total number of employees for the season. The average cost of ginning is given in Table 22. The State average for the season was \$17.58, according to the gins which reported. The USDA reports the season average ginning charges for Texas as \$18.11, which is \$.53 higher than was found in this report. The Texas average ginning charges for selected years according to the USDA are presented for information and comparison:

1930	\$5.98	1950	\$12.58
1935	6.24	1955	14.02
1940	5.49	1960	16.17
1945	7.83	1963	18.11

Table 22. TEXAS 1963-64 SEASON COMPARISON OF AVERAGE DATA FOR SELECTED FACTORS BY GINS ACCORDING TO CROP REPORTING DISTRICTS

District	Value of Gin in Dollars	Number Bales Ginned During 1963-64 Season	Number Bales To Be Ginned To Break Even	Number of Employees	Cost of Ginning Dollars	Rate of Ginning Bales Per Hour
1-N	227,167	4,149	2,617	22.8	19.44	7.5
1-S	195,193	5,099	2,847	20.3	18.08	6.6
2	131,445	3,330	2,188	13.3	17.26	5.8
3	122,500	1,142	800	6.7	17.90	3.9
4	95,185	1,962	1,229	11.9	17.82	4.7
5	77,129	2,065	1,125	12.0	15.60	4.8
6	185,238	4,420	2,762	15.4	16.83	5.5
7	184,250	2,458	2,188	9.3	15.08	6.9
8	124,828	1,582	1,131	10.2	16.94	5.7
9	94,540	2,877	1,503	16.7	15.44	5.6
10	104,286	2,458	1,404	11.2	16.42	5.4
10-A	195,819	3,110	2,332	19.7	18.96	7.6
State ^{1/}	147,280	3,202	1,971	15.4	17.58	5.9

^{1/} State figure is a weighted value.

Source: Original data (for those gins reporting at the end of the 1963-64 season)

Table 22 also contains the average value per gin, the average number of bales ginned during the 1963-64 season and the average number of bales that had to be ginned to break even. The average number of bales ginned per plant for the State was found to be 3,202. The number of bales of cotton that had to be ginned for the gin plant to break even was 1,971 bales for the 1963-64 season. The break-even point can also be expressed as the number of bales which must be ginned by a gin plant in order to meet all fixed and variable costs before any profit or return can be realized from the season's ginnings. The average number of employees in Texas gins during the season was found to average 15.4 per plant (Table 22).

Ten per cent of the total value of the 1963-64 cotton and cottonseed crop is approximately equal to the cost of ginning said crop; or if the value of the cotton alone is considered, the cost of ginning then amounts to eleven per cent of the value of the cotton produced during the season. The cost of ginning the 1963-64 Texas cotton crop amounts to 87 per cent of the value of the cottonseed sold to the oil mills from the same crop.

The data indicated that 72 per cent of the total average volume ginned was necessary to break even in 1963-64. The State average gin value for the season divided by the average number of gin employees yields an average value per employee of \$9,564.

Since the dollar value of the gin plant and labor costs represent the major expenses in the gin business, it was decided to take these factors and relate them to the average number of bales ginned and the average break-even figures by the crop reporting districts. Table 23 shows the number of bales per dollar invested in the gin and the number of bales

required to break even per dollar invested in the gin. Also included is the total number of bales ginned per employee and the number of bales required to break even per employee. The State average for the 1963-64 season for the number of bales ginned per dollar of gin investment was found to be .022 bales per dollar. The number of bales required to break even per dollar of gin investment was found to be .013 bales per dollar for the State.

Table 23. BALES PER DOLLAR VALUE AND BALES PER EMPLOYEE FOR CROP REPORTING DISTRICTS 1963-64 SEASON

District	Total Ginned/ Gin Per Dollar Value of Gin	Breakeven/ Gin Per Dollar Value of Gin	Total Ginned/ Gin Per Employee	Breakeven*/ Gin Per Employee
1-N	.018	.012	182	115
1-S	.026	.015	251	140
2	.025	.017	250	165
3	.009	.006	170	119
4	.021	.013	165	103
5	.027	.015	172	94
6	.024	.015	287	179
7	.013	.012	264	235
8	.013	.009	155	111
9	.030	.016	172	90
10	.024	.013	219	125
10-A	.016	.012	158	118
State ^{1/}	.022	.013	208	128

* Breakeven is the number of bales a gin must process to meet all fixed and variable costs before any profit can be realized.

^{1/} State figure is a weighted value.

Source: Original data.

The number of bales required to break even was 138 bales per employee for the State during the 1963-64 season. Based on the average number of bales ginned per plant for Texas during the 1963-64 season, the number of bales ginned per employee was found to be 208.

RESULTS OF ADDING NEW EQUIPMENT

Additional information was requested of those gins who indicated they had added between 40 and 80 thousand dollars worth of new equipment prior to the 1963-64 ginning season. The most common additions in relation to this new equipment were: gin stands, feeders, lint cleaners, overhead systems including stick machines and other cleaning equipment.

The gins indicated an average of some \$53,000 worth of new equipment installed prior to the start of the 1963-64 ginning season. Fifty-six per cent of those reporting the installation of new equipment had to increase the number of employees at their gin plant as a result. Those who added people to their payrolls reported an average increase of two persons.

Seventy-eight per cent reported that their per hour power cost also increased with the addition of the new equipment. Thirty-three per cent of this group reported the per bale cost for power had gone up 22 cents a bale. Of this 78 per cent who reported an increase in power cost per hour, 11 per cent reported the per bale power cost had decreased due to increased rate of ginning. Twenty-two per cent reported their power cost per hour decreased an average of 38 per cent after the addition of the new equipment.

In relation to labor costs per hour, 22 per cent reported no change. Twenty-two per cent also reported an increase in the per hour cost for labor, but half of this 22 per cent group reported a reduction in the per bale cost for labor due to increased ginning rate. The remaining 56 per cent reported a reduction in per hour cost due to labor. Half of this group reported the reduction amounted to 42 per cent less, while one-fourth reported the reduction amounted to 28 cents a bale.

Eleven per cent of the plants reported an increase, while 33 per cent reported no change in the per hour cost of repairs due to the installation of new equipment. Thirty-four per cent reported that either their per hour repair costs had not yet changed or they did not know. The other 22 per cent stated their per hour repair costs were less after installation of new equipment.

All other costs of ginning were lumped together in the category "Others." Here 34 per cent reported they did not know, 22 per cent the same or no change. Twenty-two per cent reported an increase, and 22 per cent reported a decrease. For those who reported a decrease, their average percentage of decrease amounted to about eight per cent.

The plants were asked if the installation of new equipment caused the necessity of an increase in the per bale ginning charges levied against the farmer. Twenty-two per cent reported yes and the other 78 per cent reported no.

All gins reported an increase in their rate of ginning. The average increase per 12-hour shift was about 30 bales.

Some gins furnished a breakdown of their cost figures attributed to the new equipment added and changes to their gin plant. The following data on costs per bale are based on the average of the information furnished; also included is the percentage that the various costs are of the total. These figures are for the ginning process only and do not include costs of other services rendered by the ginner to his customers.

Gin Plant Costs Per Bale, Average Data

<u>Item</u>	<u>Cost in Dollars</u>	<u>Per Cent of Total Cost</u>
Labor - all	\$ 4.54	31
Repairs	1.91	13
Power, fuel, water	1.93	13
Bagging & ties	2.41	17
Other expenses	3.72	26
Total	14.51	100

Adding new equipment often results in the need for additional employees which will result in an increase in the labor cost per bale ginned even though the rate of ginning is increased. Thus the increased capacity may not always equal the bales ginned per man hour when new employees and equipment are added.

The investment in new equipment often results in a reduction in cost of repairs per bale. Example: The gins reported a reduction per bale of 46 cents with an increase in capacity of about 24 per cent. The addition of new equipment will in some cases reduce the number of bales required to break even due to increased production and savings realized from decreased repair costs.

Bad debts and down time can reduce profit and return on investment quicker than many of the costs incurred during the ginning operation. This was noted by many of the gins reporting on the questionnaire.

The questionnaire asked: Was your 1963-64 season ginning rate better or worse than the previous season? and the reason or reasons involved? Thirty-five per cent of the gins reported the same capacity as the previous year. Forty-five per cent of the gins reported an increase in rate of ginning. The main reasons given were: New equipment installed, seed-cotton delivered to gin in better condition, improved gin efficiency due to equipment and personnel, favorable harvesting weather, etc. Twenty-one per cent reported a decrease in capacity and the reasons given were: Poor crop due to drought, poor growing conditions, too many green bolls, improper harvesting, condition of seedcotton delivered to gin, production down in area, etc. Table 24 on the following page gives this information more fully.

DISTRICT	Per cent of Gins Reporting Better Ginning Rate	Reasons for Increase in Per Cent								SAME RATE	Per cent of Gins Reporting Decrease in Ginning Rate	Reasons for Decrease in Per Cent											
		New Equipment	Gin Remodeled	New Gin	Improved Gin Efficiency	Favorable Harvesting Weather	Seed Cotton Delivered in Good Condition	Salary Increase for Employees	Other Reasons - See Footnote A			TOTAL	Late Immature Cotton	Excess Dirt and Trash	Too Many Green Bolls, Improper Harvesting	Poor Crop Due to Drouth & Poor Growing Conditions	Condition of Seed Cotton Delivered to Gin	Production Down in Area	Insufficient Personnel	Insect Infestation	Lack of Labor	Other Reasons - See Footnote B	TOTAL
1 L	48	44	11	6	11		28		100	29	23	57	43								100		
1 S	48	30	8		26	7	26	3	100	32	20		10	10	50	10	10			10	100		
2	49	15	4		12	11	50	4	100	33	18		33	33		17		17			100		
3									100	67	33		100								100		
4	50	25	10	4	21	19	19	2	100	39	11			67	11	11				11	100		
5	29				25	50	25		100	71											100		
6	41	50	10			10	20	10	100	36	23			33		50	17				100		
7	75	50			50				100	25											100		
8	26	20	30		20	10	20		100	50	24		10	10	38	14	24		4		100		
9	26				40	60			100	53	21			34				33	33		100		
10	10	100							100	60	30			50		50					100		
10A	18	33	17		50				100	64	18	12	11	11	33	11	22				100		
State Weighted Average	44	27	10	2	20	14	24	1	2	100	35	21	7	10	19	23	18	15	1	1	2	4	100

SOURCE: Original Data

- A. Better knowledge by farmers about mechanical harvesting, individual drives for machinery, less insect damage.
- B. Inefficiency at gin, ginner not interested in operations, untrained labor.

Table 24. REASONS FOR INCREASE OR DECREASE IN GINNING RATE IN 1963-64 OVER PREVIOUS SEASON BY REPORTING GINS AT END OF SEASON

SUMMARY

Since 1930 we have seen the number of gins in Texas decline by over 2,000 while the production has fluctuated about the four million bale mark, going up to the six million bale high in 1950 after having reached a low just below two million bales in 1945. The 1963-64 production was over four million bales. During the last two or three decades production within the State has shifted from the eastern and southeastern parts of the State to the central portion; then to the western, northwestern and Rio Grande Valley areas. As a result, the location of the gins has followed the pattern laid down by production movement of cotton in the State.

Based on those gins which reported at the end of the 1963-64 season, the following changes and facts become apparent when compared with earlier data for the Texas cotton ginning industry:

1. Twenty-two per cent of the active gins were built before 1940, 19 per cent between 1940 and 1949, 43 per cent between 1950 and 1959, and 16 per cent from 1960 on.
2. The decrease in gins in Texas calculated by the method of semi-averages for the period 1929 through 1962 indicates a yearly decrease or change of -82.22 gins per year. When the period is divided and determined by the method of least squares, the change for the first period, 1929 through 1945, indicates a decrease of -91.49 gins per year. The second period from 1946 through 1962 indicates a decrease of -40.07 gins per year.
3. Based on the actual number of gins in the State since 1935, we find the number in Crop Reporting Districts 1-N, 1-S, 6 and 10-A increased while the number in all remaining Crop Reporting Districts decreased during the interval.
4. The per cent of gins in the State having driers in 1940 was only 10 per cent. This increased to 31 per cent in 1945, while today all gins reporting indicated the presence of driers.
5. The method of harvesting which played a big part in the increased number of driers at the gins shows the same pattern for 1945, only five per cent was mechanically harvested while today we find the amount has increased to 81 per cent.

6. In 1935 there were 16,090 gin stands. During the interval to 1963, the number decreased 60 per cent to about 6,343. The number of gin stands per gin decreased slightly on a State average from 4.5 to 4.3 per gin over the same period.
7. The number of saws per gin increased some 12 per cent over the interval from 1935 to 1963. In 1935 the State average number of saws per gin was 337, and this increased to 378 in 1963. On the basis of the average number of saws per stand for the State, the increase was 17 per cent; from 75 saws per stand in 1935 to 88 saws per stand in 1963.
8. The number of bales ginned per 12-hour period was found to be about 46.1 per shift in 1940. This figure increased some 53 per cent over the period to 1963, when it was found to be 70.8 per shift on an average.
9. The 1963-64 season average hourly ginning rate for the State per gin was found to be 5.9 bales per hour.
10. The average number of employees per gin in Texas for the 1963-64 season was found to be 15.4 per gin which gives an estimated 20,713 people employed by the Texas cotton gins during the season.

To more clearly illustrate the changes that have taken place in Texas on the volume ginned per plant, per stand and per saw over the years from 1935 to date even with the decrease in the number of gins and other changes, the following table is presented:

Average Volume Ginned in Texas According to Crop Years
Indicated for Gin Plants, Stands and Saws

Year	Volume/Plant in Bales	Volume/Stand in Bales	Volume/Saw in Bales
1935-36	854	189	2.5
1940-41	1,040	231	3.1
1945-46	870	193	2.5
1963-64	3,202	739	8.4

Source: Original data and U. S. Department of Commerce data.

The United States Department of Agriculture reports that 4,417,000 500-pound bales were produced in Texas during the 1963-64 season and 1,811,000 tons of cottonseed. The USDA also reports that the average price per ton of cottonseed was \$52.60. Cotton Economic Research estimated the value of the lint to be \$704,075,800; and using the USDA figures for the seed, we arrive at an estimated value of \$95,265,396, which makes a total estimated value of the 1963-64 season cotton crop to be some \$799,341,196. The USDA reports that the cottonseed sold to the oil mills for crushing from the 1963-64 crop amounted to \$89.4 million dollars.

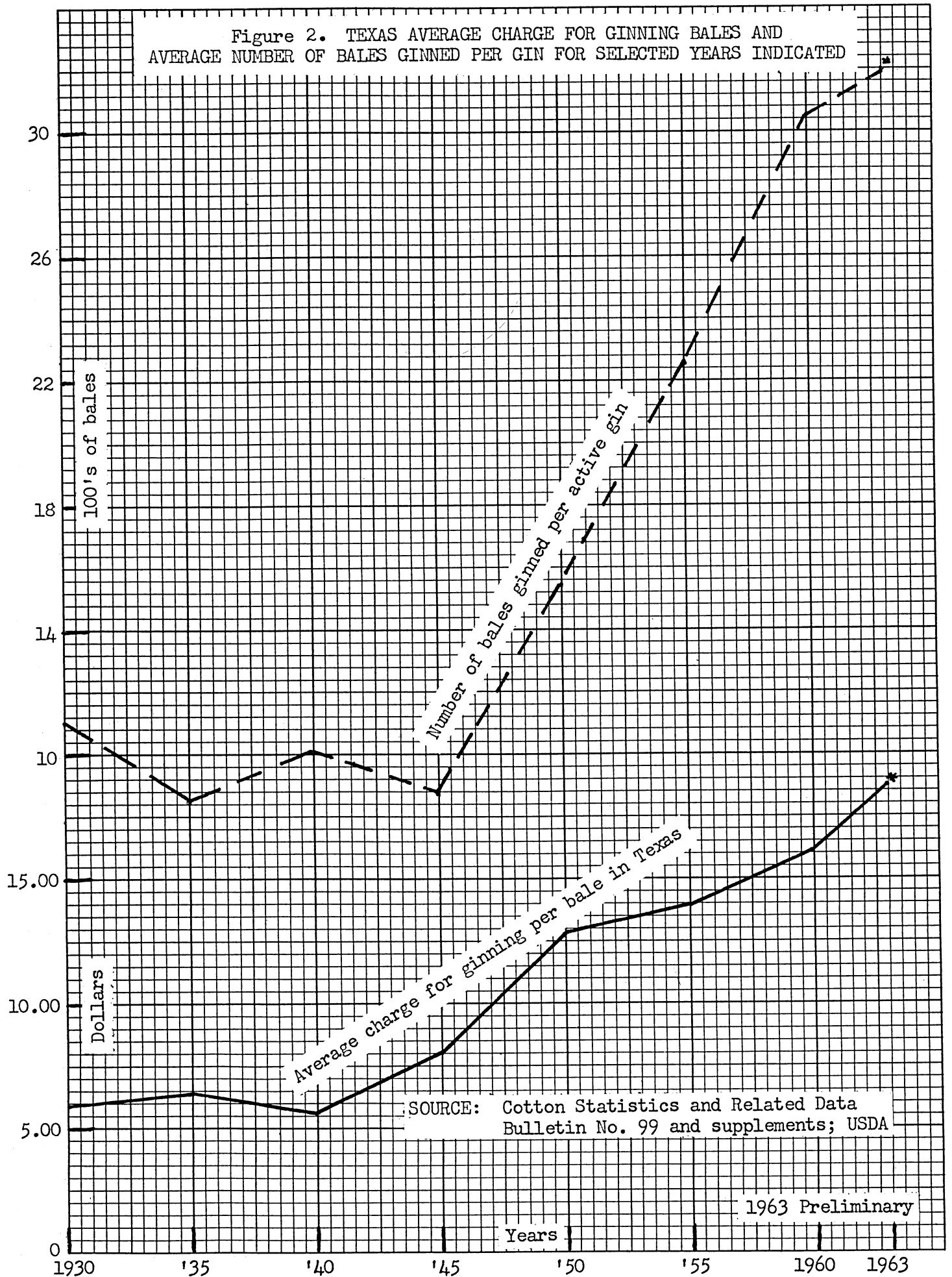
Based on the gins which reported at the end of the 1963-64 season, the following data as related to costs and values are reported or estimated:

1. The average value of the Texas gins reporting was found to be \$147,389 per gin. The estimated value of all the gins in the State is \$198,092,300.
2. Forty-seven per cent of the gins reported the addition of new equipment to their plants prior to the beginning of the 1963-64 season. Eighty-six per cent of those adding new equipment reported that their ginning rate has been increased due to the new equipment.
3. Three per cent of the gins reporting indicated that they had rebuilt their gins or build new plants prior to the start of the season.
4. The State average cost of new equipment added was \$15,400 for those adding such equipment. The State average cost for modernizing or building new gins was \$120,800. The total amount spent in adding new equipment, rebuilding gins or building new gins for those who reported amounted to some \$3,820,700 in Texas.

5. The USDA reports that the average charge for ginning in Texas for the 1963-64 season was \$18.11. The average charge for those reporting to Cotton Economic Research for the 1963-64 season was \$17.58. The total estimated charges for ginning in Texas during the 1963-64 season amounted to some \$77,947,800 based on the average costs as reported to Cotton Economic Research. See Figure 2 on the following page for a graphic picture of the ginning charges in Texas for selected years from 1930 to date.
6. During 1963-64 season the average number of bales ginned in the State was found to be 3,202 bales. See Figure 2 for a graphic presentation of the average number of bales ginned for selected years since 1930. The average number of bales ginned by Texas gins necessary to break even was found to be 1,971 bales for those gins who reported such information.
7. In Texas for the 1963-64 season on the average, .022 bales were ginned for each dollar invested in gins which reported. When this is based on the number of bales required to break even during the season the figure was found to be .013 bales for every dollar of gin value.
8. The average number of bales ginned per employee based on the average number of bales ginned in the State and on the average number of employees was found to be 208 bales per employee. When based on the number of bales reported necessary to break even, the figure was found to be 128 bales per employee.
9. Expressing some of the value and cost figures on a Texas per capita basis for 1963, we arrive at the following: Gin plant investment or value amounts to \$19.00 per capita in Texas. The cost of new equipment added, rebuilt gins and new gins amounts to \$.37 per capita. The cost of ginning the 1963-64 crop amounts to \$7.55 per capita while the estimated payroll for the labor involved comes to \$1.94 on a per capita basis. The value of the cotton lint and the cottonseed has a per capita value of \$77.45.

The addition of new equipment to the gin plant tends to increase the rate of ginning as reported in 86 per cent of the cases where such installation was made. Fifty-six per cent of the plants installing machinery reported an increase in labor requirements. However, the labor required on per bale basis will decrease if accompanied by a sufficient increase in rate of ginning. Where this occurred the reduction amounted to about \$.28 a bale. The amount and cost of power may be increased by

Figure 2. TEXAS AVERAGE CHARGE FOR GINNING BALES AND AVERAGE NUMBER OF BALES GINNED PER GIN FOR SELECTED YEARS INDICATED



the new equipment or it may be reduced. Seventy-eight per cent reported an increase, and 22 per cent reported a reduction as a result of the new equipment installed. Part of those who reported an increase noted that their per bale power costs were less due to the increased rate of ginning. The 22 per cent who reported a reduction in amount and cost of power stated that the reduction was some 38 per cent on an average. The new equipment often reduced the cost of repairs previously encountered. The general average increase in capacity reported after the addition of new equipment amounted to about 30 bales per 12-hour shift.

When contemplating the purchase of new equipment, the ginner must consider the return that he will get from his investment. The following is a formula for determining that return:

$$\frac{\text{Profit}}{\text{Investment}} = \text{Return on investment in per cent}$$

Investments should include value of buildings, land and machinery. Based on the average for those gins furnishing such information, the average profit or return on the total investment amounted to about 11 per cent after modernizing. A second factor to be considered is the "payback period" or the number of years that will be required to pay back the cost of the investment (new or additional equipment). The following is a formula for determining this:

$$\text{Payback period} = \frac{\text{Investment}}{\text{Increased earnings plus additional depreciation}}$$

The payback period for those gins who reported such information amounted to about five years on an average investment of some \$50,000.

Considering the overall picture, the reasons advanced for either an increased or decreased rate of ginning occurring during the 1963-64 season as compared with the previous season are found in Table 24. Summarizing, the increase in capacity was due to new equipment, improved efficiency on the part of the gin personnel, and the condition of the cotton. Conversely, the reason for any decrease in capacity was for the most part due to the condition of the cotton.

Thus, the condition of the cotton delivered to the gin by the farmer will affect the cost the farmer must pay for ginning, the speed with which his trailer is returned and last but not least the value he receives from the lint cotton and the seed after ginning.

