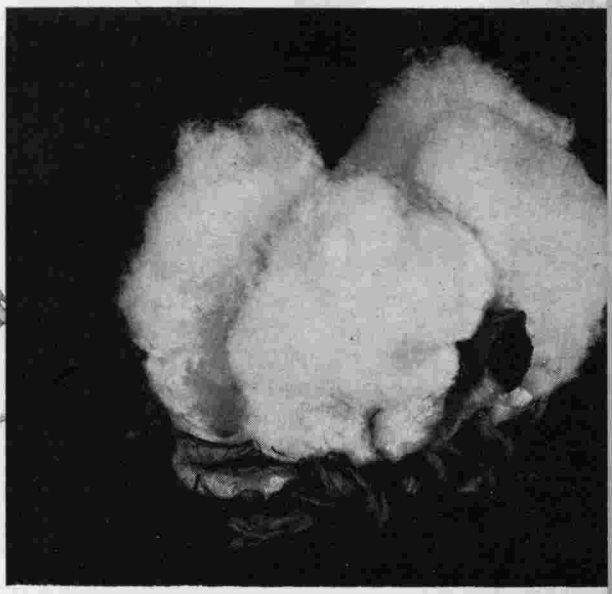
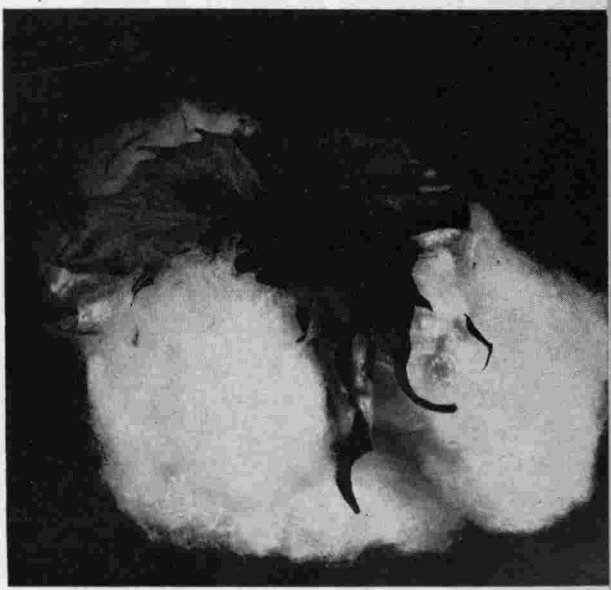
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Factors Associated with Cotton Ginning Problems in Tennessee

by B. D. Raskopf



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Summary

This study was designed to identify and evaluate the important economic problems in the ginning industry in the state, to develop some approaches to solving these problems, and to summarize and analyze the position of the ginning industry in terms of its importance, trends, capacity, changes in ginning machinery and equipment, and ginning costs.

•Some important factors associated with ginning problems are: 1) shifts in cotton production to West Tennessee; 2) acreage controls; 3) low annual volume per gin; 4) variables related to gin capacity such as seasonality of gin operations, gin down-time, methods of harvesting, and variations in annual ginnings; and 5) increased fixed and operating costs of ginning.

•For the 10-year periods, 1942-51 to 1952-61, cotton production has been increasing in the 13 West Tennessee counties of Gibson, Crockett, Tipton, Fayette, Haywood, Lauderdale, Lake, Madison, Hardeman, Carroll, Weakley, Obion and Chester. In the other 8 cotton-producing counties of West Tennessee, 36 counties of Middle Tennessee, and 18 counties of East Tennessee, cotton production has declined.

For the 9 years of acreage controls, 1950 and 1954 to 1961, the farmers in 53 of 62 cotton-producing counties under-planted their cotton acreage allotments every year. During these years the allotted acres not planted annually averaged 40,400 for 21 West Tennessee counties, 16,745 for 29 Middle Tennessee counties, and 3,661 for 12 counties of East Tennessee.

•The shifts in the cotton production and acreage control program in many areas of the state has resulted in volume per gin too small to cover cost of ginning. Of the 182 gins in 1950 with volume under 1,000 bales per gin, 92 became inactive by 1962. Of the 92 gins going out of business, 66 were in West Tennessee, 21 in Middle Tennessee, and 5 in East Tennessee.

•Low volume per gin has been an important factor affecting ginning costs, particularly during years of acreage controls. For example, in 1950 the average volume per gin dropped 543 bales

from the preceding year and ginning cost rose $5.20 per bale. From 1953 to 1957 the average volume per gin declined 734 bales and ginning cost rose $11.43 per bale.

•As an average during the peak season of ginning in 1962 less than half of the ginning capacity generally was used. Unused capacity was explained largely by the seasonality of gin operations, gin out-of-operation time (down-time) from many causes, and low gin operating efficiency because of the higher proportion of hand-snapped and machine-picked cotton.

The total daily ginning capacity (two 12-hour shifts) of all gins in the state averaged 28,790 bales since 1947 with little annual variation. On the other hand individual gin capacity as an average from 1948 to 1962 increased 37% per gin, 36% per stand, and 26% per saw. Total hourly or daily capacity of all gins has not increased during the past 15 years because the increase in capacity per gin has been offset by the inactivation of 109 gins during this period.

Since 1941 the increase in fixed and operating costs of ginning has been at a faster rate than the increase in bales per gin. While volume per gin increased 1.4 times from 1941 to 1962, the ginning cost per bale increased 6 times for depreciation and interest, 5.3 times for taxes, 3.8 times for management, 3 times for labor, and around 2 times for wrapping, fuel and power, repairs, insurance, and miscellaneous costs.

Faced with the problems of low volume, faster harvesting, and increasing fixed and operating costs, many ginners have only the following alternatives: 1) increasing gin capacity and seed cotton storage facilities in an attempt to cope with the problems associated with changes in methods of harvesting; 2) engaging in other sidelines or business activities related to ginning; 3) reducing gin down-time; 4) increasing ginning charges; or 5) ceasing operations.

The alternative ginning systems presented in this report (Appendix G) indicate that gins with 5 to 8 bales capacity per hour have low costs of ginning in volumes ranging from **3,000 to 6,000** bales per gin each year. In 1962 there were only 51 gins with volume above 3,000 bales. However, trends indicate that the number of gins is likely to decline to around 200 within the next 10 years with average volume per gin around 3,000 bales.

Contents

PAGE

SUMMARY 2

INTRODUCTION 5
- Importance of Cotton Industry in Tennessee 5
- Purpose of the Study 5
- Sources of Information 6

PRODUCTION FACTORS ASSOCIATED WITH GINNING PROBLEMS 6
- Changes in Production and Number of Gins 6
- Cotton Control Programs and Adjustments 10
- Low Volume per Gin 11
- Alternative Ginning Systems 12
- Transportation of Seed Cotton 14

GIN CAPACITY FACTORS ASSOCIATED WITH GINNING PROBLEMS 15
- Variables Related to Gin Capacity 15
  - Seasonality of gin operations 16
  - Gin-out-of-operation time 16
  - Changes in methods of harvesting 19
  - Variations in annual ginnings 19
- Gin Capacity Difficulties and Approaches to Problems 20
  - Increased gin capacity 20
  - Unused gin capacity 20
  - Modernizing gins 21
  - Investment necessary to increase gin capacity 22

INCREASED COST FACTORS ASSOCIATED WITH GINNING PROBLEMS 23
- Ginning Costs Per Bale 23
- Increased Cost Difficulties and Approaches to Problems 24
  - Shift to higher ginning capacity per hour 24
  - Gin business diversification and integration 24
  - Increase in ginning charges 25
  - Gins becoming inactive 26

APPENDIX 27

Factors Associated with Cotton Ginning Problems in Tennessee

by B. D. Raskopf

Introduction

IMPORTANCE OF COTTON GINNING INDUSTRY IN TENNESSEE

Cotton is Tennessee's leading cash crop and during the past 10 years the farm marketings of cotton averaged $106 million dollars annually. In the marketing of the cotton crop the ginners make a substantial contribution to the economy of the state in ginning and ginning services.

In 1962 the replacement value of 273 active gins in the state was estimated at $32,000,000. Ginners' costs for plant depreciation and interest amounted to $3,312,000. To gin the 1962 crop of 548,408 running bales, ginners paid $1,634,000 for labor, $1,475,000 for management, $1,294,000 for bagging and ties, $916,000 for repairs, $713,000 for fuel and power, $686,000 for insurance, $466,000 for taxes, and $576,000 for supplies and services. The total cost to producers for ginning and ginning services was estimated at $11,072,000 for the 1962 crop. For this year the ginning costs as a proportion of the farm value of the crop averaged nearly 11% or $20.19 per bale (Appendix O).

Around 60,000 farmers in Tennessee depend upon ginners, not only to gin their cotton, but to provide many other services. In 1962 the ginners bought 63% of the lint cotton and 91% of the cottonseed produced by farmers. Many ginners provide supplementary services in connection with cotton production and marketing, including 1) production credit; 2) new or improved planting seed; 3) delinting; treating and testing seed; 4) use of trucks, trailers, and dusting machines; 5) sampling baled cotton; 6) furnishing cotton market news; 7) storing cotton at the gin yard; 8) hauling cotton to the warehouse; and 9) aiding growers in placing cotton under government loan.

PURPOSE OF THE STUDY

In recent years there has been a distinct shift in both acreage and production location for cotton in the state, particularly during

the years of acreage controls. The impact of this shift in production on the cost and efficiency of ginning constitutes the major problem. The specific objectives of this study were to 1) identify and evaluate the ginning problems, and 2) develop some alternative approaches to ginning problems.

SOURCES OF INFORMATION

Annually, from 1928 to 1962, data were obtained from cotton marketing and ginning studies conducted by the Tennessee Agricultural Experiment Station in cooperation with the Cotton Division, Agricultural Marketing Service, USDA. Considerable use was made of the annual cotton production reports of the Bureau of the Census, the Tennessee Crop Reporting Service, and the Tennessee Annual Statistical Reports, Agricultural Stabilization and Conservation Committee.

The historical information on gin capacity was obtained from the Bureau of the Census; the Cotton Division, Agricultural Marketing Service, USDA; and unpublished studies made by the Tennessee Agricultural Experiment Station on ginning equipment and practices from 1928 to 1962. The data on cost of ginning were obtained annually from 28 gins during the period 1928 to 1940, and 56 gins during the years 1941 to 1962. The basic data used in developing alternative models or systems of ginning and seed cotton assembly functions were obtained from a survey of ginners, cotton producers, and truckers during the 1962 crop year.

Production Factors Associated with Ginning Problems

CHANGES IN PRODUCTION AND NUMBER OF GINS

Cotton production in Tennessee by counties and geographic areas has been undergoing significant changes during the past 30 years. On the basis of 10-year averages, 1942-51 to 1952-61,[1] there has been considerable increase in 13 of the 21 counties of West Tennessee and a substantial decrease in each of the counties of Middle and East Tennessee (Fig. 1).

[1]Ten-year averages were used to level out the effects of annual variations due to climatic conditions, control programs, and production practices.

Average annual production in West Tennessee increased from 492,000 bales during the 1942-51 period to 526,000 bales in the period 1952-61. Important increases in annual production occurred in the counties of Gibson, Crockett, Tipton, Fayette, Haywood, Lauderdale, Lake, Madison, Hardeman, Carroll, Weakley, Obion, and Chester. Production in Dyer County remained about the same but declined in other West Tennessee counties including McNairy, Shelby, Henry, Decatur, Hardin, Benton, and Henderson.

Annual production in Middle Tennessee decreased from 50,626 bales in the 1942-51 period to 41,783 bales in the 1952-61 period. A decrease was reported in each of the 31 counties producing cotton. Production in 13 counties of East Tennessee decreased from 5,541 bales in the 1942-51 period to 1,961 bales during the 1952-61 years.

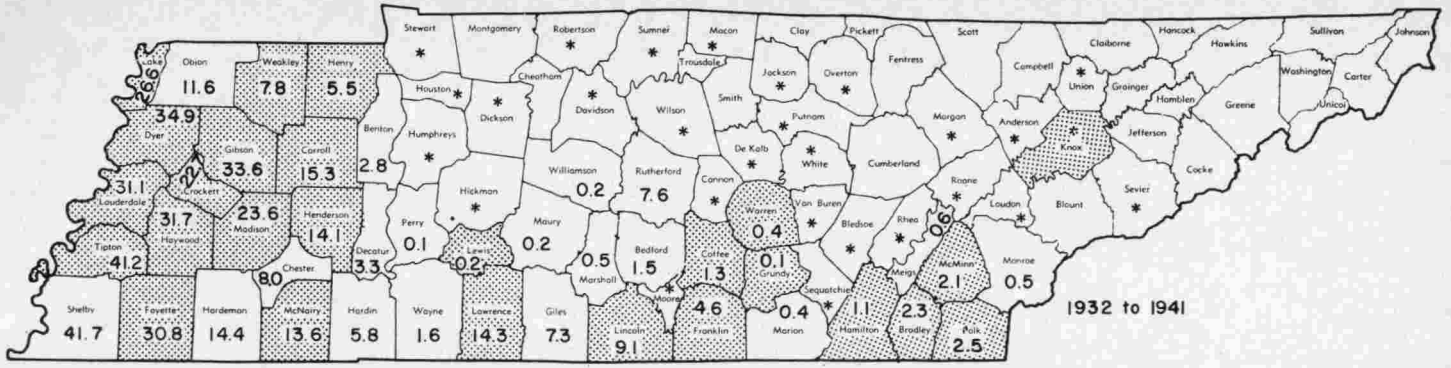
Data shown in Appendix A indicate that both Middle and East Tennessee are steadily going out of cotton production. For the period 1932-41, Middle and East Tennessee combined averaged 12.2% of the state crop but this proportion dropped to 7.7% during the 1952-61 years, and 5.9% in 1962.

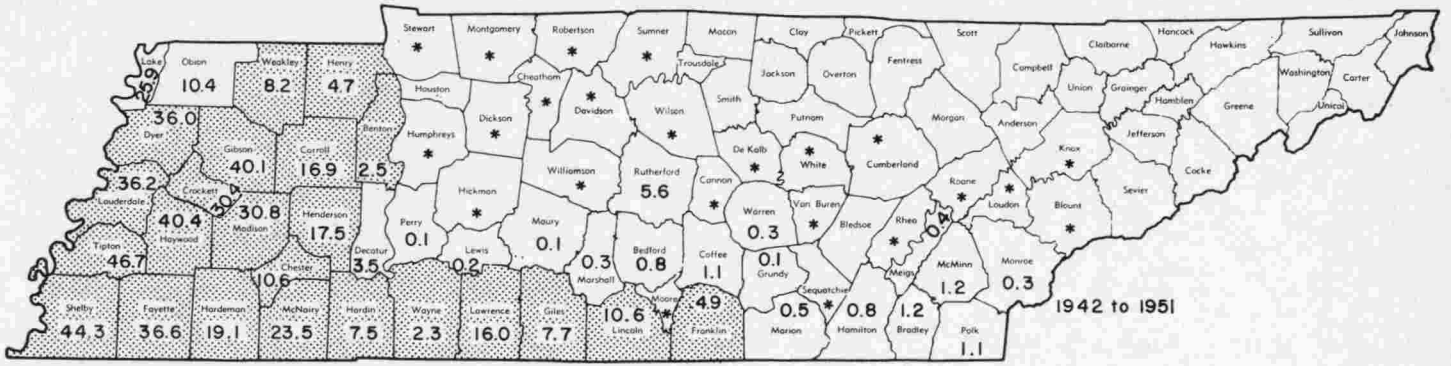
The number of active cotton gins in Tennessee decreased from a peak of 833 in 1900 to 273 in 1962. Several factors have been associated with the rapid decline in number of gin plants. Commercial ginning in the state began about 1900 when improvements in gin machinery aided in consolidating the industry into large central gins. Small planters found that the cost of operating their gins was greater than the fees for the larger gins. By 1931 only 9 plantation gins were operating in Tennessee.[2] Shifts in cotton production have also affected the number of gins in many counties.

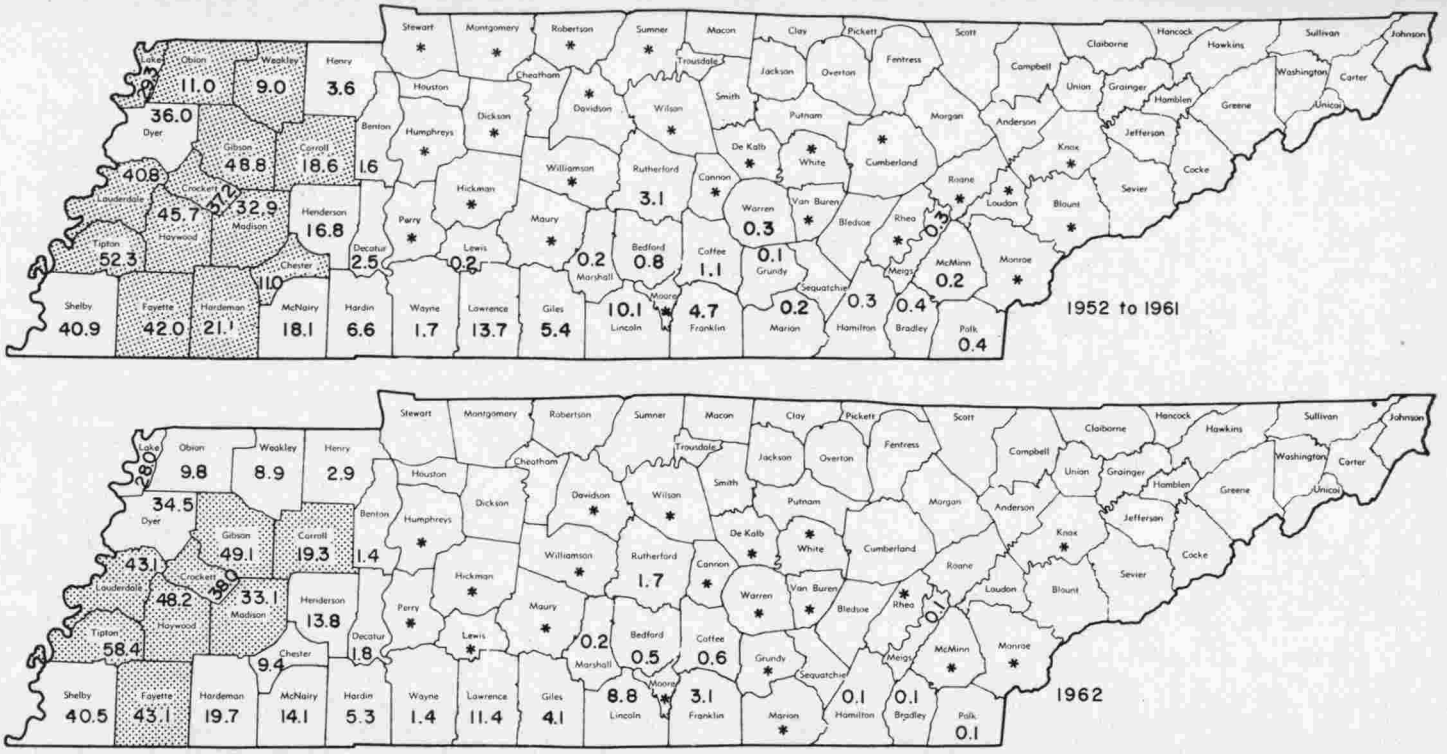
Although annual cotton production increased in the state from 1932 to 1962 the number of gins, as an average, declined in each county. During the past 30 years the greatest percentage decrease in number of gins occurred in the areas showing decreases in cotton production, including the counties of Middle and East Tennessee, and Decatur, Benton, Hardin, and Henry counties of West Tennessee (Appendix A).

Changes occurring in the number of active gins by 5-year periods in counties in Tennessee since 1915 are shown in Appendix

[2]B. D. Raskopf, **The Cotton Ginning Industry in Tennessee**, Tennessee Agricultural Experiment Station Bulletin No. 303, September, 1959.


Lake 6.0
Obion 11.6
Weakley 7.8
Henry 5.5
Dyer 34.9
Gibson 33.6
Carroll 15.3
Benton 2.8
Crockett 2.1
Lauderdale 31.1
Haywood 31.7
Madison 23.6
Henderson 14.1
Tipton 41.2
Chester 8.0
Decatur 3.3
Shelby 41.7
Fayette 30.8
Hardeman 14.4
McNairy 13.6
Hardin 5.8
Wayne 1.6
Lawrence 14.3
Giles 7.3
Lincoln 9.1
Franklin 4.6
Marion 0.4
Hamilton 1.1
Bradley 2.3
Polk 2.5
Meigs 0.6
McMinn 2.1
Monroe 0.5
Stewart
Montgomery
Robertson
Sumner
Macon
Clay
Pickett
Scott
Claiborne
Hancock
Hawkins
Sullivan
Johnson
Houston
Cheatham
Trousdale
Jackson
Overton
Fentress
Campbell
Union
Grainger
Hamblen
Greene
Washington
Carter
Unicoi
Humphreys
Dickson
Davidson
Wilson
Smith
Putnam
Morgan
Anderson
Knox
Jefferson
Cocke
Hickman
Williamson 0.2
Rutherford 7.6
Cannon
De Kalb
White
Cumberland
Roane
Loudon
Blount
Sevier
Perry 0.1
Maury 0.2
Warren 0.4
Van Buren
Bledsoe
Rhea 0.6
Lewis 0.2
Marshall 0.5
Bedford 1.5
Coffee 1.3
Grundy 0.1
Sequatchie
Moore
1932 to 1941


Lake 5.9
Obion 10.4
Weakley 8.2
Henry 4.7
Dyer 36.0
Gibson 40.1
Carroll 16.9
Benton 2.5
Crockett 5.0
Lauderdale 36.2
Haywood 40.4
Madison 30.8
Henderson 17.5
Tipton 46.7
Chester 10.6
Decatur 3.5
Shelby 44.3
Fayette 36.6
Hardeman 19.1
McNairy 23.5
Hardin 7.5
Wayne 2.3
Lawrence 16.0
Giles 7.7
Lincoln 10.6
Franklin 4.9
Marion 0.5
Hamilton 0.8
Bradley 1.2
Polk 1.1
Meigs 0.4
McMinn 1.2
Monroe 0.3
Stewart
Montgomery
Robertson
Sumner
Macon
Clay
Pickett
Scott
Claiborne
Hancock
Hawkins
Sullivan
Johnson
Houston
Cheatham
Trousdale
Jackson
Overton
Fentress
Campbell
Union
Grainger
Hamblen
Greene
Washington
Carter
Unicoi
Humphreys
Dickson
Davidson
Wilson
Smith
Putnam
Morgan
Anderson
Knox
Jefferson
Cocke
Hickman
Williamson
Rutherford 5.6
Cannon
De Kalb
White
Cumberland
Roane
Loudon
Blount
Sevier
Perry 0.1
Maury 0.1
Warren 0.3
Van Buren
Bledsoe
Rhea 0.4
Lewis 0.2
Marshall 0.3
Bedford 0.8
Coffee 1.1
Grundy 0.1
Sequatchie
Moore
1942 to 1951



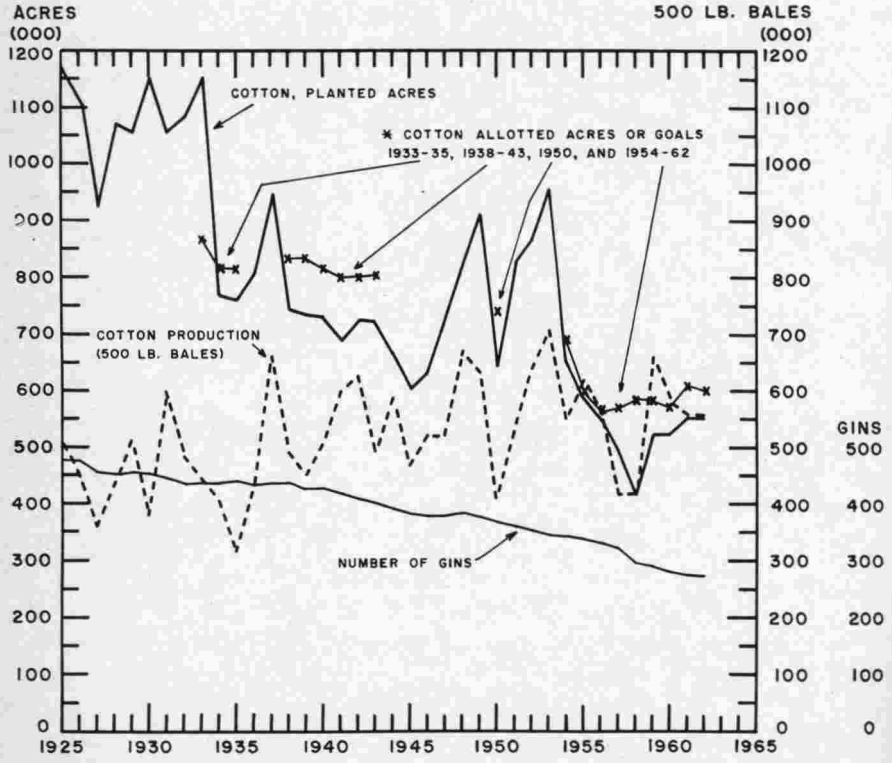
Source: Based on Appendix A.

Figure 1: Annual cotton production in thousand 500-lb. bales by counties, Tennessee, 1932-41 to 1962.

B. From 1915 to 1962, gin numbers were reduced by 247 in West Tennessee, 23 in Middle Tennessee, and 19 in East Tennessee. By 1962 all gins in 10 cotton-producing counties in Middle Tennessee and those in 4 counties of East Tennessee became inactive.

COTTON CONTROL PROGRAMS AND ADJUSTMENTS

During the 38 years, 1925 to 1962, cotton acreage controls were in effect for 19 years. In 3 of these years, 1933-35, cotton acreage was controlled through rental or retirement of acres; in 16 years, 1938-43, 1950, and 1954-62, the control was accomplished through cotton allotments. Changes in cotton production, cotton planted acres, and number of gins were associated with the cotton control programs beginning in 1933 (Fig. 2 and Appendix C).



Source: Based on Appendix C.

Figure 2. Cotton acres allotted and planted, cotton production, and number of gins, Tennessee, 1925 to 1962.

The average for the 8 years of no cotton controls (1925-32), compared with the average for the recent 8 years of controls (1955-62), showed that cotton planted acres declined over 50% and number of gins 34%. On the other hand, during the same years, cotton production increased by 17% because of the increase in yield per acre. Cotton yield per planted acre increased from an annual average of 207 pounds for the years 1925-32, to 494 pounds for the years 1955-62.

During the 1950 and 1954-62 years, when acreage allotments were in effect, Tennessee cotton producers and ginners experienced considerable difficulty in adjusting to the control program. From 1950 to 1962 the number of cotton allotments in the state dropped from 74,370 to 58,540, allotted acres from 742,000 to 601,000, planted acres from 644,000 to 553,000, and number of gins from 365 to 273 (Appendix C).

The difference between cotton acreage allotments and planted acres by counties is shown in Appendix D for the years 1950 and 1954 to 1961. These data indicate that as an average the farmers in 53 of the 62 cotton-producing counties under-planted their allotments every year.

Allotted cotton acres not planted in Tennessee ranged from 6,000 in 1956 to 167,000 in 1958 and averaged 59,800 acres annually. Ginnings per plant in 500-pound bales averaged 1,121 in 1950, 1,293 in 1957, and 1,420 in 1958. Mainly because of low volume per gin during these years the ginning costs per bale were high (Appendixes C and F).

The approach to the problem of adjusting to the cotton control program has been for the ASCS County Committees to encourage producers to protect allotments for their farms by planting all of their allotment, or where the farmer knows that he will not plant part or all of his allotment, to release this for reapportionment. In cases where farmers do not plant all of their allotments, and these are released to the county committees, this preserves the allotment planting history of the individual farmer, the county, and the state.

LOW VOLUME PER GIN

Production and ginnings per gin within a particular county generally followed the same pattern during the past 30 years. On

the other hand, wide differences existed among counties in production and ginnings per plant (Appendix E). Among counties, average ginnings per plant ranged from 437 to 2,010 bales during the years 1932-41, from 727 to 2,363 bales during the years 1942-51, from 814 to 3,157 bales during the 1952-61 period, and from 432 to 3,161 bales in 1962.

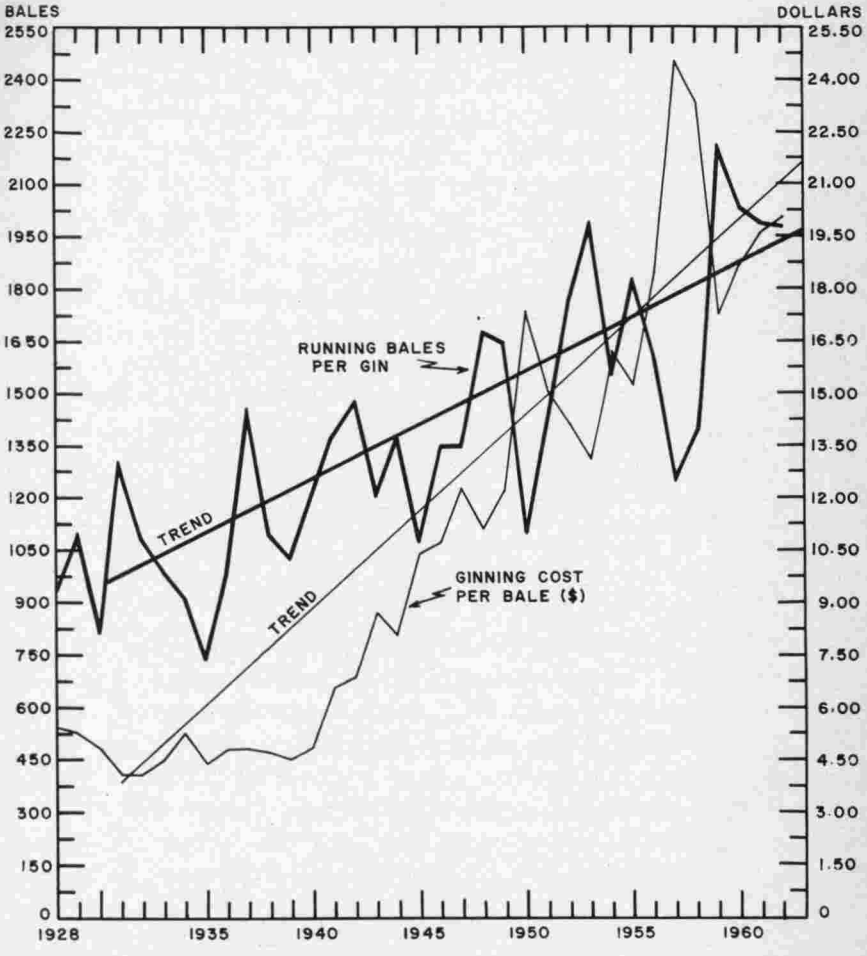
Although the trend in volume per gin for the state as a whole has been upward since 1928, the increase in ginnings per plant has not kept pace with the increased cost of ginning (Fig. 3). During the 13-year period, 1928-40, volume per gin averaged 1,048 running bales and the estimated ginning cost $4.74 per bale. With the beginning of World War II, ginning costs per bale rose rapidly and reached $24.59 in the 1957 crop year with the low volume of 1,259 bales per gin (Appendix F).

One approach to the problem of increased cost of ginning is the more rapid retirement of sub-modern gins, permitting the remaining plants to increase their volume substantially. The effects of increased volume in lowering the ginning cost per bale are indicated in Figure 3 for the 8 crop years of 1944, 1948, 1951 to 1953, 1955, 1958, and 1959. In each of these years, as volume per gin increased over the preceding year, the cost per bale for ginning declined. As an average during these 8 years, each increase in volume of 100 bales was associated with a decrease of 54 cents per bale in the cost of ginning where average volume per gin ranged from about 1,200 to 2,200 bales.

ALTERNATIVE GINNING SYSTEMS

One approach to the problem of determining the effects of plant capacity and volume on ginning costs is through designing gin models as indicated in Appendix G. This analysis attempts to determine the size of gins in capacity per hour, utilizing modern equipment, which would minimize the cost of ginning with given volumes under conditions of no seed cotton storage, and with seed cotton storage.

These data show that: 1) the cost of ginning on a bale basis declines rapidly for each model gin as the time of operation increases up to 1,200 hours; 2) at the lower volumes, generally under 4,000 bales, the costs are higher for the larger than for the smaller plants; 3) as the gin increases in capacity per hour the cost per bale for labor and power and fuel declines; 4) gins with capacity



Source: Based on Appendix F.

Figure 3. Running bales of cotton ginned per active gin and estimated ginning cost per bale, Tennessee, 1928-62.

of 5 to 8 bales per hour have the lower costs of ginning in volumes ranging from 4,000 to 6,000 bales, under conditions of no seed cotton storage and no seed cotton assembling costs; and 5) some gins might be able to increase their volumes and reduce per-bale costs through adding seed cotton storage facilities.

For example, in Gin model B (Appendix G) the cost of ginning with a volume of 3,000 bales is estimated at $15.35 per bale. If

this volume could be increased to 5,000 bales with 2,000-bale storage facilities, the total ginning cost per bale might be reduced to $13.97.

Data in Appendix G indicate that the small capacity gin (2.5 bales per hour) has the lowest ginning cost per bale up to the 3,000 bales. However, nearly all gins of this capacity level have become inactive in the state (Appendix N). The plants with higher capacity in bales per hour have been able to secure a greater volume per gin.

In the 1962 crop year, 8 gins with 3.3 bales capacity per hour averaged 1,250 bales per plant; 90 gins with 4.2 bales capacity averaged 1,600 bales; 13 gins with 4.5 bales capacity averaged 1,850 bales; 43 gins with 5 bales capacity averaged 1,900 bales; 78 gins with 5.6 bales capacity averaged 2,150 bales; 27 gins with 6.6 bales capacity averaged 2,500 bales; 7 gins with 7 bales capacity averaged 2,750 bales; and 7 gins with over 8 bales capacity averaged 4,885 bales.

TRANSPORTATION OF SEED COTTON

The cost of assembling seed cotton at the gin is not included in the ginning costs in Appendix G since this cost generally has been borne by the producer. With the trend in the ginning industry toward larger volume per gin and seed cotton storage at the gin, the cost of transporting cotton to the gin may become a cost of ginning. For this reason data were secured in 1962 on the cost of transporting seed cotton to the gin.

A survey of truckers and producers in 1962 indicates that the cost per bale of transporting seed cotton to the gin varies considerably per bale, per hour, or per mile, according to the number of miles traveled. Within a gin radius of 25 miles the cost ranges from about 13 cents per bale for the shortest hauls (round-trips), to $1.22 per bale for trips up to 25 miles (Table 1). These data are based on the use of a ¾-ton truck and six 5-bale trailers—two trailers used in transit, two left in the field with the cotton picker, and two left at the gin.

Based on season travel of 12,500 miles, the truck fixed cost averages 5 cents per mile and operating cost 5 cents per mile. Trailer cost averages 6 cents per mile. Truck driver labor averages $1.25 per hour. The cost per bale for transporting seed cotton from 2 to 50 miles increases about 2.225 cents per bale for each additional mile over a 2-mile haul.

Table 1. Estimated cost of transporting seed cotton by truck and two 5-bale trailers, Tennessee, 1962

Round-trip miles	Truck and trailer cost $ (a)	Labor (b)		All costs per round trip			
		Time min.	Cost $	Total $	Per bale $	Per hour $	Per mile $
1	.16	53	1.10	1.26	.126	1.43	1.2600
2	.32	56	1.17	1.49	.149	1.60	.7450
8	1.28	74	1.54	2.82	.282	2.29	.3525
14	2.24	92	1.92	4.16	.416	2.71	.2971
20	3.20	110	2.29	5.49	.549	2.99	.2745
26	4.16	128	2.67	6.83	.683	3.20	.2627
32	5.12	146	3.04	8.16	.816	3.35	.2550
38	6.08	164	3.42	9.50	.950	3.48	.2500
44	7.04	182	3.79	10.83	1.083	3.57	.2461
50	8.00	200	4.17	12.17	1.217	3.65	.2434

(a) 16 cents per mile. (b) Includes time on road, in loading, and at the gin @ $1.25 per hour.

Gin Capacity Factors Associated with Ginning Problems

VARIABLES RELATED TO GIN CAPACITY

The potential daily ginning capacity in Tennessee, based on one 12-hour shift (10 hours of operation), increased from 8,424 bales in 1906 to 15,048 bales in 1954, declined to 13,630 bales in 1959 and since increased to 14,064 bales in 1962 (Appendix J). Although the number of active gins decreased from 702 in 1906 to 273 in 1962, the average capacity per gin per hour steadily increased from 1.2 bales in 1906, to 5.2 bales in 1962 (Appendix J).

However, as an average for each ginning season, only a small proportion of the potential ginning capacity in Tennessee has been used. As shown in Appendix I, only 25 to 51 (12-hour shifts per gin) were actually needed to gin the crop during any one of the years 1930 to 1962. But during these seasons most gins were open only from 68 to 169 days, the average being around 100 days. The variations in used ginning capacity, on an annual basis, is explained mainly by seasonality of gin operations, gin out-of-operation time, changes in methods of harvesting, and variations in production.

Seasonality of Gin Operations

Seed cotton is not delivered in an even flow to gins because of variations in growing and harvesting due to weather conditions and because of differences in methods of harvesting. As shown in Table 2, the cotton harvesting season in Tennessee is about 200 days, extending from around September 1 to March 20 of the following year.[3] The periods, September 1 to 15, and November 14 to March 20, are characterized by intermittent ginning. Used gin capacity as a percent of total potential capacity is low during these periods.

From September 1 to 15 during the 41 years from 1922 to 1962, no cotton was ginned in 1923 and the most ginned was 101,503 bales in 1956, requiring less than 7 of the 12 work days for ginning with 12-hour shifts daily. From November 14 to March 20, during the 41 years, the most ginned in one period, January 16 to March 20, was 102,186 bales in 1945, requiring less than 8 of the 53 work days for ginning with 12-hour shifts daily. In the 1962 crop year, during the period September 1 to 15, and November 14 to March 20, only 7 of the 116 work days were required for ginning, and this is based on 10 hours of ginning in a 12-hour shift.

During the middle or peak periods, between September 16 and November 14, enough seed cotton was received at the gins during some years to require more than one 12-hour shift per gin daily. In 1941, for example, 207,015 bales were ginned during the period, September 16 to 30, requiring 16 (12-hour shifts per gin). In 1922 the ginnings totaled 203,749 bales from October 1 to 17, requiring 20 (12-hour shifts per gin).[4]

Gin Out-of-Operation Time

The low percentage of used ginning capacity, on an annual basis, is partly explained by the different kinds of gin down-time (Table 3). For example, during the 1962 crop year, of the 201 days from September 1, 1962, to March 20, 1963, about 92% of the time (4,434 hours) might be classed as down-time. This gin

[3]Ginning periods are based on reports issued by the Bureau of the Census for cotton ginned during the periods September 1-15 and 16-30, October 1-17 and 18-31, November 1-13 and 14-30, December 1-12, December 13 to January 15, and January 16 to March 20.

[4]A 12-hour shift includes 12 hours of ginning and about 2 hours of gin down-time or stops required for care of machinery, failures in gin machinery and equipment, gin fires, rest stops, and brief waiting periods for seed cotton.

Table 2. Least and most running bales of cotton ginned annually in specified periods, and time needed for ginning, 1922-62

Census ginning periods	Days		Least ginned during period		Most ginned during period		1962 crop	
	Total	Work-days	1922 to 1962	12-hour shifts needed for ginning	1922 to 1962	12-hour shifts needed for ginning	Total	12-hour shifts needed for ginning
	No.	No.	Bales	No.	Bales	No.	Bales	No.
Sept. 1-15	15	12	0 (a)	0	101503 (i)	6.8	48589	3.5
16-30	15	12	0 (a)	0	207015 (j)	16.0	123786	8.8
Oct. 1-17	17	15	69987 (b)	5.4	203749 (k)	20.1	186456	13.3
18-31	14	12	39736 (c)	3.8	146596 (l)	10.1	96782	6.9
Nov. 1-13	13	10	20736 (d)	1.5	116487 (m)	10.1	46883	3.4
14-30	17	14	18417 (e)	1.2	77237 (n)	5.6	29940	2.1
Dec. 1-12	12	10	3939 (f)	0.3	53397 (o)	4.1	8703	0.6
Dec. 13-Jan. 15	34	27	2693 (g)	0.2	66224 (p)	5.1	5156	0.4
Jan. 16-Mar. 20	64	53	447 (h)	0.1	102186 (q)	7.9	2113	0.2

(a) 1923. (b) 1945. (c) 1923. (d) 1947. (e) 1956. (f) 1942.
(g) 1954. (h) 1954. (i) 1956. (j) 1941. (k) 1922. (l) 1948.
(m) 1931. (n) 1960. (o) 1940. (p) 1937. (q) 1945.

Source: Computed from Annual Reports of the Bureau of the Census and Appendix J.

Table 3.—Estimated gin out-of-operation time and ginning capacity by specified periods, 273 gins, Tennessee, 1962 crop year

Census ginning period	Total time	Gin down-time			Ginning time (c)	Ginnings in running bales	Actual gin capacity (d)	
		Sundays and legal holidays	Short stops (a)	Long stops (b)			Excluding Sundays, holidays, and short stops	Percent used
			Hours			Bales	Bales	
Sept. 1-15	360	72	8	245	35	48589	337536	14.4
16-30	360	72	18	182	88	123786	337536	36.7
Oct. 1-17	408	48	28	199	133	186456	421920	44.2
18-31	336	48	14	205	69	96782	337536	28.7
Nov. 1-13	312	72	8	199	33	46883	281280	16.7
14-30	408	72	4	311	21	29940	393792	7.6
Dec. 1-12	288	48	2	232	6	8703	281280	3.1
Dec. 13-Jan. 15	816	168	1	644	3	5156	759456	0.7
Jan. 16-Mar. 20	1536	264	1	1269	2	2113	1490784	0.2
All periods	4824	864	84	3486	390	548408	4641120	11.8

(a) Includes 2 hours of each 12-hour shift for cleaning, lubricating, adjusting and repairing gin machinery, brief waiting periods for seed cotton, mechanical failures in gin machinery and equipment, overheating in the driers, choke-ups in gin equipment, rest stops, and fires occurring from various causes.

(b) Long waiting periods for seed cotton, stops caused by rainy weather or gin breakdowns, or complete shutdown for the season.

(c) Number of bales ginned divided by average ginning capacity of 1,406.4 bales per hour for 273 gins—see Appendix J.

(d) Rated gin capacity in Tennessee in 1962 averaged 6.4 bales per gin per hour or 1,758 bales per hour for 273 gins. Actual capacity averaged 5.2 bales per gin per hour or 1,406.4 bales per hour for 273 gins. Actual capacity averages 20% less than rated capacity and is accounted for in differences in condition and weights of seed cotton per bale, time resulting from individual gin stands running idle or empty to avoid mixing of cotton of different producers, or because the conventional feeding system does not keep all of the stands supplied with seed cotton all of the time.

Source: Computed from reports of the Bureau of the Census and a survey of gins made in Tennessee during the 1961 and 1962 crop years.

down-time included 864 hours of Sundays and legal holidays when most of the gins did not operate; 84 hours for short gin stops during workshifts; and 3,486 hours for long stops—mainly waiting periods for seed cotton, stops caused by rainy weather, stops for repair of gin machinery, or complete shutdown.

In actual operations during the 1962 crop year many gins closed after about 3 months operation, September to November, or operated only 1 to 3 days a month from December to March. The ginning season for the 273 gins averaged 100 days (2,400 hours) with only 390 hours of actual ginning time.

Changes in Methods of Harvesting

One study in Tennessee showed that actual gin capacity per hour averages about 20% lower than rated capacity.[5] Much of this difference annually can be attributed to the high proportion of hand-snapped, and to a lesser extent, machine-picked cotton which generally contains a larger amount of foreign matter than found in hand-picked cotton. For example, in 1962 about 24% of the 555,000 bales of cotton produced was hand-snapped and required an average of 580 pounds more seed cotton to gin a bale than was needed for hand-picked cotton. In the same year, 41% of the crop was machine-picked and required an average of 58 pounds more seed cotton to gin a bale than was needed for hand-picked cotton (Appendix K).

Hand-snapped cotton, and to a lesser extent, machine-harvested cotton, place a heavier load on the conveying, drying, cleaning, and extracting machinery ahead of the gin stands. To deliver the same weight of cleaned and conditioned seed cotton to the gin saws, the conventional feeding systems must handle considerably more hand-snapped or machine-picked cotton than is required with hand-picked cotton.[5] The increased amount necessary with hand-snapped cotton averaged 46% during the 1945-62 period, and varied by years from 36% to 60%. The increased amount with machine-picked cotton averaged 8% during the 1954-62 period and varied annually from 0 to 12% (Appendix K).

Variations in Annual Ginnings

Changes in the volumes of the cotton crops from year to year exert considerable influence on gin capacity needed during various

[5]B. D. Raskopf, **The Cotton Ginning Industry in Tennessee,** Tennessee Agricultural Experiment Station Bulletin No. 303, September, 1959.

periods in the season. When cotton ginnings in Tennessee are grouped by 10-year periods, volumes of cotton ginned from September to November during the past 40 years have changed considerably. For the 10-year periods, 1922-31 to 1952-61, the increase in ginnings averaged 37,344 bales during September 1-15 period, 62,148 bales for the September 16-30 period, 29,401 bales for the October 1-17 period, 23,551 bales for the October 18-31 period, and 13,253 bales for the November 1-13 period (Appendix L).

These changes in ginnings were partly due to the increase in production in the state. Cotton ginnings rose from an average of 416,546 bales during the years 1922-31, to 556,017 bales for the years 1952-61, an increase of 3,500 bales annually.

Gin Capacity Difficulties and Approaches to Problems

The factors of seasonality of gin operations, gin out-of-operation, changes in methods of harvesting, and variations in cotton production have resulted in four important problems in the Tennessee ginning industry: 1) how to cope with the need for increased ginning capacity per hour during the season; 2) how to reduce the rate of unused capacity during slack ginning periods; 3) how to modernize gins to meet the changing conditions in methods of harvesting and ginning capacity; and 4) what sum must be invested to boost gin capacity for periods of peak harvest.

Increased Gin Capacity

During the past 40 years the Tennessee ginners have increased gin capacity sufficiently to meet the need for peak season ginnings during any one year (Table 2). As indicated in Appendix I, although the number of gins declined and annual ginnings increased from 1906 to 1962, the total ginning capacity of all gins per 12-hour shift has about kept pace with the increase in ginnings. While the number of gins declined from 702 in 1906 to 273 in 1962, the number of gin stands per gin increased 89% and the number of saws per gin increased 145%. During this period, as an average per hour, gin capacity increased 76% per saw, 114% per gin stand, and 333% per gin (Appendix J).

Unused Gin Capacity

There are two possible approaches to the problem of unused gin capacity. One is by shortening the period of time when the

gin is open for business during the 200-day season when cotton is harvested. As indicated previously, many gins in Tennessee during the 1962 crop year closed after about 90 days of operation or operated only a few days a month after the peak of the ginning season.

During periods of actual gin operation many ginners are making special efforts to decrease gin down-time by: 1) providing additional sucker pipes for unloading long trailers so cotton is always available for ginning; 2) installing bulk or master feed control systems to keep gin stands supplied with cotton all of the time; and 3) devising split stream arrangements in cotton drying, over-head cleaning, and in lint cleaning. During 1962 crop year, of the 273 gins, 191 were equipped with two or more drying stages, 170 had cotton overflow bypass systems, and 42 had bulk or master feed control systems.

A second possible approach to the problem of unused gin capacity is to store seed cotton in trailers, baskets, or cotton houses, and gin it during slack periods.[6] This method offers some possibility of stabilizing ginning costs per bale by operating gins at or near their efficient rates of ginning for a longer period of time (Appendix G). About one-third of the gins in 1962 reported seed cotton storage facilities, ranging from 5 to 300 bales per gin.

Modernizing Gins

Since 1935 vast changes have occurred in the use of additional auxiliary equipment in gins for conditioning, cleaning, extracting, and other ginning functions. Ginning machinery and equipment additions became necessary as ginning capacity increased (Appendix J), and as methods of harvesting changed (Appendix K).

From 1935 to 1961 the number of active gins declined from 438 to 277, but gin capacity per hour per gin increased from 3 to 5 bales. The proportion of gins equipped with seed cotton driers increased from 1% to 99%, overhead seed cotton cleaners from 55% to 94%, overhead seed cotton extractors from 16% to 81%, lint cleaners from 0 to 99%, and fire prevention and fire fighting devices (green boll traps, magnets, and carbon dioxide systems) from 10% to 63% (Appendix M).

[6]**Storing Seedcotton in Trailers, Trailer Baskets, and Cotton Houses in Arkansas and Missouri in 1961 and Its Effect on Quality and Value of Lint.** Agricultural Experiment Stations of Arkansas and Missouri, Mimeograph Series 119, November, 1962.

The added investments and other fixed and operating costs represented by such equipment have contributed to the upward trend in ginning costs. From 1941 to 1961, ginning costs increased 3 times per bale. The average replacement value per gin rose from $13,840 in 1941 to $111,660 in 1961. Annual depreciation and interest on investment per gin increased from $1,384 in 1941 to $11,166 in 1961. All fixed and operating costs per bale showed considerable increases from 1941 to 1961 (Appendix O). As gins modernized and gin investment increased, there were annual increases in costs of labor and management, repairs and maintenance, fuel and power, insurance, taxes, and sundries.

While ginning costs from 1941 to 1961 increased over 4 times per gin and 3 times per bale, it is difficult to determine the proportion of this increase which is due to gin modernization. This is true, because during the 21-year period, wide variations among gins existed: in bales ginned per gin; types of ginning machinery and equipment; length of ginning season; size of gin; number in the gin crew; hourly rate of pay; gin shut-down time; services offered by ginners; kind and amount of fuel and power used; methods of assessing gin charges; methods of depreciation; type and amount of insurance carried; rates and bases of assessment for taxes; and changes in price levels of equipment and supplies.

In the approach to the problem of gin modernization, high volume per gin has been a key factor in holding down ginning costs. During the years 1958 to 1961, gin modernization consisted of adding several new and larger gin plants; remodeling gin machinery, equipment, and buildings; and installing much auxiliary gin equipment. However, during these 4 years volume per gin rose from 1,382 to 1,987 bales and ginning costs per bale declined from $23.32 to $19.62 (Appendix M).

Investment Necessary to Increase Gin Capacity

To aid in answering the question as to the investment necessary to increase gin capacity for periods of peak harvest, the gins in Tennessee were grouped for the crop years 1955 and 1962 (Appendix N) into the following: by number and size of gin stand, by gin capacity per hour, and by gin plant investment.

The replacement value of 335 gins in 1955 is estimated at $19,611,000 or $58,540 per gin. By 1962 the number of gins declined to 281 (273 active) but replacement value increased to

$32,016,000 or $117,275 per gin. Modernization of gins during the 8 years, together with advance in price of machinery and buildings, contributed mostly to the higher gin investment. From 1955 to 1962, hourly capacity per gin increased from 4.4 to 5.2 bales and many gins installed auxiliary gin equipment as indicated in Appendix M.

Data in Appendix N indicate that, in gin remodeling, an increase in capacity of 1 bale per hour was associated with an increase in gin plant investment of about $8,550 in 1955, but this had increased to $15,000 in 1962. For example, in 1962 in Tennessee there were 90 gins with hourly average capacity per gin of 4.2 bales and gin replacement value estimated at $103,000 per gin. As an average, a gin in this group could be converted to a capacity of 8 bales per hour at a cost of $57,000, and to 12 bales per hour at a cost of $117,000.

In making the conversion to higher capacity in bales per hour, the ginner has the choice of many different combinations of makes and types of gin machinery. Today in Tennessee there are about 10 different new systems with saws ranging from 12 to 18 inches in diameter and from 75 to 177 in number per stand. When matched with the proper auxiliary equipment, the new model gin stands have from 2 to 3 times the hourly capacity of the same number of gin stands bought new a few years ago.

Increased Cost Factors Associated with Ginning Problems

GINNING COSTS PER BALE

During the past 35 years or from 1928 to 1962, total ginning cost—as based on an 11-year moving average—increased about 56 cents per bale annually. Most of this increase occurred after World War II (Fig. 3). Based on the data obtained annually from 56 ginners, the cost per bale for ginning rose from an average of $6.54 in 1941 to $20.19 in 1962. The 11-year moving average increase was 67.5 cents per bale annually. During the same years the average volume per gin rose from 1,375 to 1,980 bales, or over 36 bales annually when based on the 11-year moving average (Appendix O).

During the past 22 years, major fixed and operating costs per bale showed annual average increases of 26.2 cents for depreciation and interest, 9.9 cents for management, 8.2 cents for labor, 5.5 cents for repairs and maintenance, 4.8 cents for power and fuel, 4.2 cents for bagging and ties, 2.8 cents for taxes, 2.0 cents for insurance, and 3.9 cents for miscellaneous costs. Since 1941 the increase of each major fixed and operating cost has been at a faster rate than the increase in bales per gin. While volume per gin increased 1.4 times from 1941 to 1962, the ginning cost per bale increased 6 times for depreciation and interest; 5.3 times for taxes; 3.8 times for management; 3 times for labor; and about 2 times for wrapping, fuel and power, repairs and maintenance, insurance, and miscellaneous costs.

INCREASED COST DIFFICULTIES AND APPROACHES TO PROBLEMS

With the upward trend in all fixed and operating costs of ginning in recent years many ginners are faced with one or more of the following alternatives: 1) try to minimize the cost of operations by shifting to higher ginning capacity per hour; 2) adopt business diversification and integration; 3) increase the charge for ginning; or 4) become inactive.

Shift to Higher Ginning Capacity Per Hour

The trend in the ginning industry in Tennessee is toward higher ginning capacity in bales per hour in an attempt to minimize the costs of ginning and at the same time cope with the problems associated with rapid changes in methods of harvesting. A survey of ginners in 1962 indicated that within the next 10 years gin capacity per gin for all active gins is likely to average around 8 bales per hour.

Gin Business Diversification and Integration

Many of the ginners in the state, faced with increased operating costs, have found survival possible by engaging in other business activities related to ginning. All ginners bought cottonseed from farmers; 95% bought cotton from producers; and 60% were engaged in one or more activities of supplying farmers with credit for cotton production, selling producers new or improved

seed, selling fertilizer, feed and supplies, and hauling baled cotton from the gin to the warehouse. In 1962 about 63% of all the lint cotton and 91% of the cottonseed produced in the state was bought by the ginners (Appendix P).

Increase in Ginning Charges

Ginning charge per running bale in Tennessee averaged $4.74 for the period 1928 to 1940. From 1941 to 1962 the charges increased from $5.41 to $15.95 or an annual average increase of 50 cents per bale (Table 4).

Table 4. Ginning charge per bale in Tennessee, 1928-40 and 1941-62

Crop year	Ginning charge		Crop year	Ginning charge	
	500-lb. bale	Running bale		500-lb. bale	Running bale
	$	$		$	$
1928-40	4.63	4.74	1952	10.42	10.66
1941	5.21	5.41	1953	10.91	11.16
1942	5.52	5.70	1954	11.12	11.40
1943	5.77	5.92	1955	11.86	12.00
1944	6.07	6.36	1956	12.04	12.49
1945	6.17	6.42	1957	13.26	13.54
1946	7.75	7.91	1958	13.44	13.55
1947	7.77	7.97	1959	13.96	13.99
1948	8.40	8.77	1960	14.30	14.47
1949	8.48	8.62	1961	15.42	15.45
1950	10.02	10.12	1962	15.71	15.95
1951	10.40	10.51			

Source: **Annual Reports on Charges for Ginning Cotton, 1928-62,** Cotton Division, Agricultural Marketing Service, USDA.

Data on ginning charges (Table 4) and costs of ginning (Appendix F) indicate that as an average, custom ginning as a business itself has not been profitable in Tennessee since 1940. For each of the years 1941 to 1962, as an average, the cost per bale for ginning exceeded the ginning charge. During this period about one-third of the gins annually operated at a loss. Most of the gins operating at a loss have gone out of business. The number of active gins in Tennessee declined from 423 in 1940 to 273 in 1962. Some ginners used profits made from other operations to offset losses incurred in ginning.[7]

[7]B. D. Raskopf, **The Cotton Ginning Industry in Tennessee,** Tennessee Agricultural Experiment Station Bulletin No. 303, September, 1959.

Gins Becoming Inactive

The number of gins in Tennessee during the past 20 years declined at the rate of nearly 7 per year. This trend is likely to continue during the next 10 years for the following three reasons:

1) Data in Appendix A indicate that cotton production is declining in 80% of the 75 cotton-producing counties. In the 61 counties where production declined during the 10-year periods, 1942-51 to 1952-61, the annual ginnings per plant averaged under 900 bales. In these 61 counties the number of active gins declined from 153 in 1942 to 84 in 1961, a decrease of 45%. In 14 counties in West Tennessee, although cotton production has been increasing, the number of active gins declined from 255 in 1942 to 193 in 1961, a decrease of 24%.

2) With increased costs of ginning, volume per gin has become a more important factor and the small volume plants have found it difficult or impossible to survive. From 1941 to 1962 the number of firms in Tennessee ginning under 1,000 bales decreased from 163 to 32, and the number ginning from 1,000 to 2,000 bales decreased from 172 to 96 (Appendix H).

3) The trend is upward in gin capacity per hour or to plants capable of ginning from 125 to 200 bales of cotton daily. With the rapid shift to machine harvesting (Appendix K), most producers prefer to gin at the larger plants where there is less waiting in lines.

Appendix

APPENDIX A

Average annual cotton production and number of gins by specified periods in Tennessee, 1932-41 to 1952-61 and 1962

Counties	1932-1941	1942-1951	1952-1961	1962	1932-1941	1942-1951	1952-1961	1962
	Av. prod. in 500-lb. bales				Average number of gins			
Tipton	41183	46651	52310	58400	22.6	21.5	19.6	19
Gibson	33580	40122	48810	49100	25.5	22.4	21.2	20
Haywood	31679	40353	45710	48200	21.1	21.3	20.3	19
Fayette	30821	36596	41970	43100	29.0	23.9	19.3	16
Shelby	41696	44334	40860	40500	32.6	31.2	23.4	19
Lauderdale	31143	36222	40820	43100	24.2	22.2	20.5	19
Crockett	22672	30363	37170	38000	14.3	13.0	12.0	12
Dyer	34911	35999	36010	34500	23.3	21.1	17.2	17
Madison	23573	30806	32875	33100	24.8	22.7	20.1	19
Lake	26641	25891	29280	28000	14.9	12.6	10.2	10
Hardeman	14410	19074	21140	19700	17.6	16.7	14.0	11
Carroll	15312	16932	18645	19300	18.4	18.0	14.9	13
McNairy	13626	23498	18080	14100	20.9	17.7	17.0	14
Henderson	14061	17506	16770	13800	19.4	17.7	16.0	11
Chester	8047	10598	11010	9400	10.1	10.2	7.7	6
Obion	11609	10387	10964	9800	8.8	9.3	7.7	7
Weakley	7759	8157	8980	8860	7.0	6.1	5.3	4
Hardin	5752	7528	6573	5250	9.7	7.4	5.0	5
Henry	5462	4721	3598	2850	4.6	3.8	3.3	3
Decatur	3333	3521	2454	1820	5.3	3.4	1.8	1
Benton	2759	2455	1641	1440	3.0	3.4	1.9	1
West Tenn.	420029	491714	525670	522320	357.1	325.6	278.4	246
Lawrence	14333	16025	13654	11400	19.1	15.9	12.7	10
Lincoln	9144	10615	10076	8830	11.0	9.0	6.8	5
Giles	7347	7655	5351	4110	9.6	7.0	4.7	4
Franklin	4550	4903	4721	3130	4.0	3.2	2.8	2
Rutherford	7643	5587	3131	1650	6.4	4.5	3.6	3
Wayne	1750	2288	1734	1400	3.9	2.7	0.8	0
Other (30)	4738	3553	3116	1552	5.7	5.4	1.8	1
Mid. Tenn.	49505	50626	41783	32072	59.7	47.7	33.2	25
Bradley	2163	1199	444	109	2.0	2.0	1.4	1
Polk	2532	1133	363	102	3.9	2.4	1.4	0
McMinn	2076	1169	249	65	3.9	2.3	1.0	1
Other (15)	2295	2040	905	332	3.0	2.0	1.0	0
East Tenn.	9066	5541	1961	608	12.8	8.7	4.8	2
State	478600	547881	569414	555000	429.6	382.0	316.4	273

Source: Computed from Annual Reports of the Tennessee Crop Reporting Service and the Bureau of the Census, 1932-62.

APPENDIX B

Number of active cotton gins in Tennessee, by specified years, 1915-62

County	1915	20	25	30	35	40	45	50	55	60	62
	Number of active gins										
Tipton	35	30	21	23	22	22	22	20	20	19	19
Gibson	26	21	22	24	27	24	23	22	22	20	20
Haywood	36	26	22	19	23	21	21	22	21	19	19
Fayette	42	32	30	30	30	28	24	21	19	17	16
Shelby	47	47	40	32	31	36	31	30	27	19	19
Lauderdale	29	27	24	26	24	22	21	22	22	19	19
Crockett	15	11	16	15	15	14	13	12	12	12	12
Dyer	21	18	26	24	25	22	21	19	17	17	17
Madison	36	33	27	27	23	26	23	22	21	19	19
Lake	14	14	19	18	14	15	14	11	10	10	10
Hardeman	32	22	21	18	18	17	17	16	15	11	11
Carroll	25	19	19	19	18	18	18	18	16	13	13
McNairy	33	23	22	24	22	20	17	18	18	15	14
Henderson	33	25	24	22	20	18	17	17	18	12	11
Chester	14	9	9	8	10	11	10	10	9	6	6
Obion	5	7	11	9	10	9	9	9	8	7	7
Weakley	6	6	7	7	7	7	6	6	6	5	4
Hardin	22	16	13	13	11	9	6	7	5	5	5
Henry	5	5	5	4	5	5	4	4	3	3	3
Decatur	11	9	7	5	6	5	4	3	2	1	1
Benton	6	4	5	4	3	3	3	3	2	2	1
West Tenn.	493	404	390	371	364	352	324	312	293	251	246
Lawrence	5	10	13	21	20	18	17	16	14	11	10
Lincoln	11	12	11	11	11	11	9	9	8	5	5
Giles	19	13	13	13	10	8	7	6	5	4	4
Franklin	1	3	3	4	4	4	3	3	3	2	2
Rutherford	7	7	9	7	7	6	4	4	4	3	3
Wayne	2	3	3	3	4	4	3	2	2	0	0
Coffee	0	0	1	1	1	2	2	2	1	1	1
Bedford	1	2	2	2	1	2	2	2	0	0	0
Maury	1	2	2	1	1	1	0	0	0	0	0
Lewis	0	1	1	1	1	1	0	0	0	0	0
Hickman	0	1	1	1	0	0	0	0	0	0	0
Williamson	0	1	1	1	0	0	0	0	0	0	0
Marshall	0	1	1	1	1	1	1	1	0	0	0
Warren	1	1	1	1	1	1	1	1	0	0	0
Perry	0	1	1	0	0	0	0	0	0	0	0
Wilson	0	0	1	0	0	0	0	0	0	0	0
Mid. Tenn.	48	58	68(a)	68	62	59	49	46	37	26	25
Bradley	4	5	3	3	2	2	2	2	2	1	1
Polk	6	4	5	4	4	4	2	2	2	1	0
McMinn	9	5	6	4	4	4	3	1	1	1	1
Hamilton	0	2	2	1	1	1	1	1	0	0	0
Monroe	1	1	1	1	1	1	1	1	0	0	0
Meigs	1	1	1	1	0	0	0	0	0	0	0
East Tenn.	21	18	18	14	12	12	9	7	5	3	2
State	562	480	476	453	438	423	382	365	35	280	273

(a) Includes 4 gins located in other counties in Middle Tennessee.

Source: Computed from annual reports of the Bureau of the Census.

APPENDIX C

Cotton farms, acreage, yields, production, and gins, Tennessee, 1925 to 1962

Crop year	Cotton farms	Acres of cotton (000)			Yield per acre		Prod. 500 lb. bales (000)	Gins	Bales per gin
		Allotted or goal	Planted	Harvested	Planted	Harvested			
	No.	No.	No.	No.	Lbs.	Lbs.	No.	No.	No.
1925	87650	(a)	1163	1146	212	215	515	476	1082
1926	87824	(a)	1106	1089	195	198	451	474	951
1927	87998	(a)	921	912	186	188	359	454	791
1928	87172	(a)	1071	1042	191	197	429	451	951
1929	88346	(a)	1055	1044	233	236	515	455	1132
1930	88898	(a)	1152	1129	157	160	378	453	834
1931	89450	(a)	1054	1050	270	271	595	444	1340
1932	90002	(a)	1080	1063	212	216	480	431	1114
1933	90554	883 (b)	1151	883	184	240	444	433	1025
1934	91105	812 (b)	763	759	254	255	405	432	938
1935	88365	812 (b)	757	750	200	202	317	438	724
1936	85625	(a)	805	797	257	260	433	431	1005
1937	32885	(a)	943	937	335	337	661	434	1523
1938	80145	822 (b)	742	733	316	320	490	433	1132
1939	77405	832 (b)	733	707	293	304	449	423	1061
1940	75231	814 (b)	729	715	334	340	509	423	1203
1941	73056	803 (b)	690	680	414	420	598	418	1431
1942	70881	801 (b)	725	715	412	418	625	408	1532
1943	68706	807 (b)	723	720	325	326	491	400	1228
1944	66531	(a)	665	660	404	407	562	391	1437

1945	66632	(a)	605	590	368	378	466	382	1220
1946	66734	(a)	635	630	391	394	519	379	1369
1947	66835	(a)	734	730	338	340	519	377	1377
1948	66937	(a)	823	820	389	390	669	382	1751
1949	67038	(a)	911	895	332	338	633	377	1679
1950	74370	742(b)	644	630	304	310	409	365	1121
1951	72118	(a)	826	785	309	325	534	359	1487
1952	69864	(a)	866	860	352	355	638	350	1823
1953	67610	(a)	958	950	350	353	702	344	2041
1954	65356	690(b)	657	648	399	404	548	342	1602
1955	65478	594(b)	581	570	513	522	623	335	1860
1956	65164	564(b)	558	543	473	486	552	330	1673
1957	62002	569(b)	495	465	401	427	415	321	1293
1958	62234	583(b)	416	400	481	501	419	295	1420
1959	61706	582(b)	525	510	601	619	660	290	2276
1960	61496	573(b)	525	512	531	544	583	280	2082
1961	61067	611(b)	557	538	475	492	554	277	2000
1962	58540	601(b)	553	538	480	493	555	273	2033
No control		(a)	914	902	277	280	529	413	1281
Control		710(b)	659	633	368	384	508	364	1396

(a) = Years of no acreage controls. (b) = Years of acreage controls.

Source: Computed from annual reports of the Tennessee Crop Reporting Service and Tennessee Annual Statistical Reports, ASCS Programs, 1950 and 1954 to 1962.

APPENDIX D

Difference between cotton acreage allotments and planted acreage, by counties, Tennessee, 1950 and 1954-61

Counties	1950	1954	1955	1956	1957	1958	1959	1960	1961
West Tenn. Allotted acres not planted (a)									
Tipton	2880	467	+ 398	+3167	+ 46	6703	346	468	1446
Gibson	5201	1489	583	498	5547	11650	2685	3161	2551
Haywood	2944	258	+ 133	+ 474	3551	9185	116	1899	1633
Fayette	5929	869	+1710	+ 633	843	5495	806	+ 45	212
Shelby	11452	3035	1829	910	4777	10615	4095	2963	3978
Lauderdale	1478	956	119	6	1670	6281	876	1086	4067
Crockett	958	722	782	+ 148	3586	8517	1058	1182	1268
Dyer	1003	930	+ 106	+ 178	3944	8531	1055	795	1127
Madison	4509	1378	665	+ 132	2436	5718	2343	691	1319
Lake	984	+ 905	+ 275	+ 164	+ 10	2035	+ 447	+ 454	209
Hardeman	3420	663	311	197	2191	6177	1344	1250	960
Carroll	3096	1040	287	527	3439	6794	2518	2172	1846
McNairy	7085	1887	707	127	2552	7750	2134	1878	2274
Henderson	2156	1074	141	42	1915	6401	1670	1345	1339
Chester	1207	465	223	+ 175	1204	3807	681	466	423
Obion	3449	999	383	253	2157	4437	1399	1687	1408
Weakley	3864	1053	831	576	3568	4760	2758	2843	2497
Hardin	2592	1104	295	+ 137	1549	3814	1818	1489	1653
Henry	2320	643	558	631	1983	2714	2207	2110	1865
Decatur	1776	837	237	209	949	1905	704	857	782
Benton	2455	672	390	320	1415	1948	1192	1061	841
Total	70758	19636	5719	+ 912	49220	125237	31358	28904	33698

Middle Tenn. Allotted acres not planted									
Lawrence	1803	3132	869	1159	8002	13981	5450	4460	4900
Lincoln	1620	876	525	335	2296	4798	2986	1729	2083
Giles	2922	1582	972	783	2969	4808	3360	2776	2788
Franklin	1889	911	453	469	2004	3131	1910	1899	1386
Rutherford	3933	792	489	436	2136	3575	3142	1596	1461
Wayne	1790	867	352	195	1100	1854	1071	735	980
Bedford	1164	387	350	239	609	1162	1179	969	882
Coffee	1062	282	227	208	762	1133	901	615	572
Warren	759	237	167	161	364	559	497	430	419
20 other(b)	1899	712	562	522	1137	1676	1395	669	1327
Total	18841	9778	4966	4507	21379	36677	21891	15878	16798
East Tenn. Allotted acres not planted									
Bradley	1528	797	601	483	805	995	841	538	698
Polk	1105	666	361	293	620	782	608	513	559
McMinn	2842	795	520	359	651	765	641	556	664
Hamilton	591	344	280	262	606	579	458	532	554
Meigs	449	313	231	194	371	485	352	393	481
Monroe	993	250	200	178	256	282	254	235	241
6 other(c)	548	271	112	74	169	267	205	179	177
Total	8056	3436	2305	1843	3478	4155	3359	2946	3374
State total	97655	32850	12990	5438	74077	166069	56608	47728	53870

(a) + indicates acres over-planted.

(b) Cannon, Cumberland, Davidson, DeKalb, Dickson, Grundy, Hickman, Humphreys, Lewis, Marshall, Maury, Montgomery, Moore, Perry, Robertson, Stewart, Van Buren, White, Williamson, and Wilson.

(c) Knox, Loudon, Marion, Rhea, Roane, and Sequatchie.

Source: Computed from Tennessee Annual Statistical Reports, ASCS, Nashville, Tennessee.

APPENDIX E

Bales of cotton produced per gin and ginnings per gin, annual average, by counties, Tennessee, 1932-41 to 1952-61

Counties	1932-1941	1942-1951	1952-1961	1962	1932-1941	1942-1951	1952-1961	1962
West Tenn.	**Prod./gin, 500 lb. bales**				**Ginnings/gin, 500 lb. bales**			
Tipton	1822	2170	2669	3074	1835	2200	2605	3105
Gibson	1317	1791	2302	2455	1351	1866	2401	2547
Haywood	1501	1895	2252	2537	1409	1797	2237	2515
Fayette	1063	1531	2175	2694	933	1329	1821	2097
Shelby	1279	1421	1746	2132	1317	1431	1734	2137
Lauderdale	1287	1632	1991	2268	1426	1822	2189	2582
Crockett	1585	2336	3098	3167	1645	2363	3024	3147
Dyer	1498	1706	2094	2029	1560	1712	2062	2026
Madison	951	1357	1636	1742	947	1297	1588	1635
Lake	1788	2055	2871	2800	2010	2205	3157	3161
Hardeman	819	1142	1510	1791	878	1287	1656	1997
Carroll	832	941	1251	1485	856	1008	1292	1556
McNairy	652	1328	1064	1007	716	1055	1127	1060
Henderson	725	989	1048	1255	703	1011	1076	1215
Chester	797	1039	1430	1567	768	996	1367	1618
Obion	1319	1117	1424	1400	1206	1116	1626	1444
Weakley	1108	1337	1694	2215	877	964	1398	1725
Hardin	593	1017	1315	1050	437	750	992	900
Henry	1187	1242	1090	950	992	992	921	938
Middle Tenn.								
Lawrence	750	1008	1075	1400	850	1123	1199	1234
Lincoln	831	1179	1482	1766	832	1357	1774	2304
Giles	765	1094	1139	1028	673	980	980	857
Rutherford	1194	1242	870	550	1228	1386	862	432
Other counties								
52 (a)	755	831	1124	1421	613	727	814	732
State	1114	1434	1800	2033	1112	1421	1790	2029

(a) Includes 2 counties in West Tennessee, 32 in Middle Tennessee, and 18 in East Tennessee, producing cotton one or more years, 1932-61.

Source: Computed from annual reports of the Bureau of the Census, and the Tennessee Crop Reporting Service, 1932-61.

APPENDIX F

Relation of cotton volume to ginning costs per gin, Tennessee, 1928 to 1962

Crop year	Active gins	Running bales			Estimated cost of ginning per bale (a)	
		Total	Ginned			
			Per gin	11-yr. av. (b)	Annual	11-yr. av. (b)
	No.	Bales	Bales	Bales	$	$
1928	451	423471	939	939	5.43	
1929	455	504282	1108	975	5.38	
1930	453	371433	820	971	4.88	
1931	444	577994	1302	962	4.07	
1932	431	467491	1085	1010	4.06	
1933	433	428881	990	1038	4.47	4.75(b)
1934	432	396655	918	1045	5.24	4.67
1935	438	315602	721	1053	4.42	4.62
1936	431	422197	980	1103	4.79	4.77
1937	434	633335	1459	1119	4.80	5.02
1938	433	473761	1094	1129	4.70	5.45
1939	423	432383	1022	1164	4.51	5.78
1940	423	502871	1189	1188	4.83	6.25
1941	418	574121	1373	1245	6.54	6.82
1942	408	602538	1477	1278	6.88	7.50
1943	400	479791	1199	1298	8.74	8.07
1944	391	538251	1377	1348	8.08	8.76
1945	382	449656	1177	1356	10.43	9.93
1946	379	509943	1345	1381	10.69	10.86
1947	377	507032	1345	1418	12.25	11.55
1948	382	641070	1678	1465	11.16	12.12
1949	377	622498	1651	1498	12.20	12.80
1950	365	404411	1108	1539	17.40	13.46
1951	359	525383	1463	1577	15.11	14.19
1952	350	621119	1775	1569	14.15	15.45
1953	344	685751	1993	1574	13.16	16.46
1954	342	534001	1561	1622	16.22	17.02
1955	335	613059	1830	1658	15.27	17.61
1956	330	527484	1598	1738	18.49	17.82
1957	321	404292	1259	1787	24.59	18.28(b)
1958	295	411038	1393	1818	23.32	
1959	290	642245	2215	1849	17.31	
1960	280	570876	2039	1880	18.73	
1961	277	550310	1987	1911	19.62	
1962	273	548408	2009	1942	20.19	

(a) Based on 18 gins, 1928-40, and 56 gins, 1941-62.

(b) Based on 11-year moving average.

Source: Computed from annual reports of the Bureau of the Census, and unpublished studies made by the Tennessee Agricultural Experiment Station.

APPENDIX G

Estimated ginning cost per bale by different gin capacities and volume per gin, with and without specified amounts of seed cotton storage facilities, Tennessee, 1962

Gin models	A		B		C		D	
Seed cotton storage	None	1000 bales	None	2000 bales	None	4000 bales	None	6000 bales
Bales per hour	2.5	2.5	5	5	8	8	12	12
Invest. ($) (a)	77500	99500	115000	159000	160000	248000	220000	352000
Annual fixed cost per gin ($)								
Depreciation (b)	5386	6486	7993	10193	11120	15520	15290	21890
Interest (c)	2325	2985	3450	4770	4800	7440	6600	10560
Management (d)	2900	2900	3400	3400	4000	4000	4800	4800
Maintenance (e)	775	995	1150	1590	1600	2480	2200	3520
Taxes (f)	446	572	661	914	920	1426	1265	2024
Total	11832	13938	16654	20867	22440	30866	30155	42794
Operating cost per bale ($)								
Wrapping	2.38	2.38	2.38	2.38	2.38	2.38	2.38	2.38
Labor (g)	2.67	2.67	2.00	2.00	1.67	1.67	1.39	1.39
Power, fuel	2.32	2.32	1.97	1.97	1.64	1.64	1.40	1.40
Insurance	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25
Miscellaneous	1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.20
Repairs	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Total	10.82	10.82	9.80	9.80	9.14	9.14	8.62	8.62
Bales per gin	**Estimated cost of ginning per bale ($) (h)**							
1000	22.65	24.76	26.45	30.67	31.58	40.01	38.78	51.41
2000	16.74	17.79	18.13	20.24	20.36	24.58	23.70	30.02
3000	14.76	15.47	15.35	16.76	16.62	19.43	18.67	22.88
4000		14.31	13.96	15.02	14.75	16.86	16.16	19.32
5000			13.13	13.97	13.63	15.31	14.65	17.18
6000			12.58	13.28	12.88	14.28	13.65	15.75
7000				12.78	12.35	13.55	12.93	14.73
8000				12.41	11.95	13.00	12.39	13.97
9600					11.48	12.36	11.76	13.08
10000						12.23	11.64	12.90
11000						11.95	11.36	12.51
12000						11.71	11.13	12.19
13600						11.41	10.84	11.77
14400							10.71	11.59
20400								10.72

(a) See Appendix N for gin plant investment without seed cotton storage. Additional investment for plants with seed cotton storage is estimated at $22 per bale and includes steel baskets, basket lifters with tractors and corrugated tin roofs to protect stored cotton from weather.

(b) 8% annually on gin machinery and equipment and 5% on buildings.

(c) 6% interest charge on ½ of investment. (d) Management cost for 6 months. (e) 1% of gin plant investment. (f) $5.75 tax rate on gin plant investment. (g) Labor at $1.25 per hour. (h) Costs of ginning without seed cotton storage were computed on a per bale basis for each gin operating two 12-hour shifts daily with 10 hours of ginning per shift up to 60 days or 1,200 hours.

APPENDIX H

Number of active gins by specified volume of ginning, Tennessee, 1941-62

Crop year	Bales per gin								Active gins	Running bales ginned (000)	Bales per gin
	Under 1000		1000-1999		2000-2999		3000 and over				
	No.	%	No.	%	No.	%	No.	%	No.	Bales	Bales
1941	163	39	172	41	60	14	23	6	418	574.1	1373
1942	138	34	179	44	69	17	22	5	408	602.5	1477
1943	186	46	159	40	44	11	11	3	400	479.8	1199
1944	153	39	164	42	58	15	16	4	391	538.3	1377
1945	184	48	159	42	33	9	6	1	382	449.7	1177
1946	150	40	156	41	59	15	14	4	379	509.9	1345
1947	135	36	175	46	57	15	10	3	377	507.0	1345
1948	95	25	176	46	73	19	38	10	382	641.1	1678
1949	103	27	164	44	68	18	42	11	377	622.5	1651
1950	182	50	135	37	41	11	7	2	365	404.4	1108
1951	129	36	136	38	66	18	28	8	359	525.4	1463
1952	103	30	134	38	66	19	47	13	350	621.1	1775
1953	76	22	124	36	87	25	57	17	344	685.8	1993
1954	51	15	146	43	94	27	51	15	342	534.0	1561
1955	42	12	148	44	96	29	49	15	335	613.1	1830
1956	36	11	149	45	98	30	47	14	330	527.5	1598
1957	85	26	137	43	79	25	20	6	321	404.3	1259
1958	73	25	142	48	62	21	18	6	295	411.0	1393
1959	64	22	120	42	62	21	44	15	290	642.2	2215
1960	42	15	117	42	71	25	50	18	280	570.9	2039
1961	40	15	95	34	92	33	50	18	277	550.3	1987
1962	32	12	96	35	94	34	51	19	273	548.4	2009
Average	103	30	144	41	70	20	32	9	349	543.8	1558

Source: Computed from annual reports of the Bureau of the Census.

APPENDIX I

Ginning capacity of Tennessee gins, 1906-1962

Crop year	Active gins	Total ginned (000)	Ginning capacity 12-hour shifts (000)	12-hour shifts needed to gin crop	Crop year	Active gins	Total ginned (000)*	Ginning capacity 12-hour shifts (000)	12-hour shifts needed to gin crop
	No.	Bales	Bales	No.		No.	Bales	Bales	No.
1906	702	304	8.4	37	1945	382	450	13.0	35
1915	562	296	9.6	31	1946	379	510	13.3	39
1920	480	315	9.6	33	1947	377	507	13.9	37
1925	476	513	10.9	48	1948	382	641	14.5	45
1930	453	371	11.3	33	1949	377	622	14.7	43
1931	444	578	11.5	51	1950	365	404	14.6	28
1932	431	467	11.6	41	1951	359	525	14.7	36
1933	433	429	12.1	36	1952	350	621	14.7	43
1934	432	397	12.5	32	1953	344	686	14.8	47
1935	438	316	13.1	25	1954	342	534	15.0	36
1936	431	422	12.9	33	1955	335	613	14.7	42
1937	434	633	13.0	49	1956	330	527	14.9	36
1938	433	474	13.0	37	1957	321	404	14.4	28
1939	423	432	13.1	33	1958	295	411	13.6	31
1940	423	503	13.1	39	1959	290	642	13.6	48
1941	418	574	13.0	45	1960	280	571	13.7	42
1942	408	603	13.1	47	1961	277	550	13.9	40
1943	400	480	13.2	37	1962	273	548	14.1	39
1944	391	538	13.3	41	Av.	444	444	11.9	38

*Running bales.

Source: Computed from annual reports of the Bureau of the Census and unpublished studies made by the Tennessee Agricultural Experiment Station, 1928 to 1962.

APPENDIX J

Active gins, classified by number of stands and saws, and by ginning capacity, Tennessee, 1906-62

Crop year	Active gins	Gin stands		Gin saws			Gin capacity per hour			
		Total	Per gin	Total	Per gin	Per stand	Per gin	Per stand	Per saw	All gins
	No.	No.	No.	No.	No.	No.	Bales	Bales	Lbs.	Bales
1906	702	1244	1.8	84085	120	68	1.2	0.7	5.0	842.4
1915	562	1293	2.3	87924	156	68	1.7	0.7	5.4	955.4
1920	480	1248	2.6	84864	177	68	2.0	0.8	5.7	960.0
1925	476	1380	2.9	93840	197	68	2.3	0.8	5.8	1094.8
1930	453	1404	3.1	95472	211	68	2.5	0.8	5.9	1132.5
1931	444	1421	3.2	96210	217	68	2.6	0.8	6.0	1154.4
1932	431	1422	3.3	96975	225	68	2.7	0.8	6.0	1163.7
1933	433	1428	3.3	101033	233	71	2.8	0.8	6.0	1212.4
1934	432	1426	3.3	102689	238	72	2.9	0.9	6.1	1252.8
1935	438	1422	3.3	106741	244	75	3.0	0.9	6.1	1314.0
1936	431	1422	3.3	108072	251	76	3.0	0.9	6.0	1293.0
1937	434	1432	3.3	108259	249	76	3.0	0.9	6.0	1302.0
1938	433	1429	3.3	106475	246	75	3.0	0.9	6.1	1299.0
1939	423	1396	3.3	106096	251	76	3.1	0.9	6.2	1311.3
1940	423	1396	3.3	106120	251	76	3.1	0.9	6.2	1311.3
1941	418	1379	3.3	104804	251	76	3.1	0.9	6.2	1295.8
1942	408	1347	3.3	103719	254	77	3.2	1.0	6.3	1305.6
1943	400	1320	3.3	101640	254	77	3.3	1.0	6.5	1320.0
1944	391	1290	3.3	100362	257	78	3.4	1.0	6.6	1329.4
1945	382	1269	3.3	99702	261	79	3.4	1.0	6.5	1298.8
1946	379	1251	3.3	98829	261	79	3.5	1.1	6.7	1326.5
1947	377	1282	3.4	101278	269	79	3.7	1.1	6.9	1394.9
1948	382	1299	3.4	103920	272	80	3.8	1.1	7.0	1451.6
1949	377	1282	3.4	102560	272	80	3.9	1.1	7.2	1470.3
1950	365	1241	3.4	99280	272	80	4.0	1.2	7.4	1460.0
1951	359	1221	3.4	97680	272	80	4.1	1.2	7.5	1471.9
1952	350	1190	3.4	95200	272	80	4.2	1.2	7.7	1470.0
1953	344	1204	3.5	96052	279	80	4.3	1.2	7.7	1479.2
1954	342	1197	3.5	96957	284	81	4.4	1.3	7.8	1504.8
1955	335	1170	3.5	94424	282	81	4.4	1.3	7.8	1474.0
1956	330	1155	3.5	93555	284	81	4.5	1.3	7.9	1485.0
1957	321	1130	3.5	91530	285	81	4.5	1.3	7.9	1444.5
1958	295	1040	3.5	84051	285	81	4.6	1.3	8.1	1357.0
1959	290	997	3.4	80908	279	81	4.7	1.4	8.4	1363.0
1960	280	954	3.4	77766	278	82	4.9	1.4	8.8	1372.0
1961	277	955	3.4	78276	283	82	5.0	1.5	8.8	1385.0
1962	273	940	3.4	80146	294	85	5.2	1.5	8.8	1406.4

Source: Computed from annual reports of the Bureau of the Census and unpublished studies made by the Tennessee Agricultural Experiment Station, 1928 to 1962.

APPENDIX K

Number of bales of cotton produced, by methods of harvesting, and weight of seed cotton per bale, Tennessee, 1928-62

Crop year	Production 500 lb. bales (000)	Method of harvesting and weight of seed cotton per bale								
		Hand-picked			Hand-snapped			Machine-picked		
		Bales (000)		Wt. of seed cotton	Bales (000)		Wt. of seed cotton	Bales (000)		Wt. of seed cotton
	No.	No.	%	Lbs.	No.	%	Lbs.	No.	%	Lbs.
1928-44	493	444	90	1391	49	10	1840	0	0	(b)
1945	466	405	87	1279	60	13	1885	1	(a)	(b)
1946	519	472	91	1332	46	9	2023	1	(a)	(b)
1947	519	462	89	1277	56	11	1903	1	(a)	(b)
1948	669	602	90	1285	65	10	1876	2	(a)	(b)
1949	633	576	91	1360	55	9	1970	2	(a)	(b)
1950	409	356	87	1344	51	13	1931	2	(a)	(b)
1951	534	443	83	1354	88	16	1932	3	(a)	(b)
1952	638	555	87	1324	75	12	1926	8	1	(b)
1953	702	639	91	1326	52	7	1974	11	2	(b)
1954	548	488	89	1346	49	9	1899	11	2	1459
1955	623	486	78	1457	105	17	2083	32	5	1601
1956	552	497	90	1290	33	6	2063	22	4	1443
1957	415	336	81	1429	66	16	1995	13	3	1510
1958	419	356	85	1454	46	11	2261	17	4	1410
1959	660	502	76	1390	105	16	1892	53	8	1446
1960	583	379	65	1391	93	16	2013	111	19	1442
1961	554	299	54	1410	111	20	2034	144	26	1473
1962	555	194	35	1426	133	24	2006	228	41	1484
1945-62	555	462	83	1360	68	12	1981	25	5	1474

(a) Less than 1%.

(b) No data.

Source: Computed from annual reports of the Bureau of the Census and the Cotton Division, Agricultural Marketing Service, USDA, and unpublished studies made by the Tennessee Agricultural Experiment Station, 1928 to 1962.

APPENDIX L

Number of running bales of cotton ginned in specified periods in Tennessee, average 1922-31 to 1952-61 and 1962

Period	Unit	1922-31	1932-41	1942-51	1952-61	1962
Sept. 1-15	Bales	6520	29847	23580	43864	48589
	%	1.6	6.4	4.5	7.9	8.9
Sept. 16-30	Bales	52066	96448	93813	114214	123786
	%	12.5	20.7	17.8	20.5	22.6
Oct. 1-17	Bales	113393	119739	138450	142794	186456
	%	27.2	25.8	26.2	25.7	34.0
Oct. 18-31	Bales	78593	80591	99000	102144	96782
	%	18.9	17.3	18.7	18.4	17.6
Nov. 1-13	Bales	54552	50601	55722	67805	46883
	%	13.1	10.9	10.6	12.2	8.5
Nov. 14-30	Bales	44727	39934	51473	43223	29940
	%	10.7	8.6	9.8	7.8	5.5
Dec. 1-12	Bales	22199	20755	22247	20482	8703
	%	5.3	4.5	4.2	3.7	1.6
Dec. 13-Jan. 15	Bales	27867	19111	20378	16197	5156
	%	6.7	4.1	3.8	2.9	0.9
Jan. 16-Mar. 20	Bales	16629	7704	23395	5294	2113
	%	4.0	1.7	4.4	0.9	0.4
Annual	Bales	416546	464730	528058	556017	548408
	%	100.0	100.0	100.0	100.0	100.0
Gin cap. (a)	Bales	10959	12755	13829	14335	14064

(a) Daily gin capacity of all active gins operating 10 hours per 12-hour shift.

Source: Data on ginning were computed from annual reports of the Bureau of the Census. Data on ginning capacity computed from Appendix J.

APPENDIX M

Type of auxiliary equipment used by gins and average ginning costs per gin, by specified periods, Tennessee, 1935-62

Item	Unit	1935-1936	1941-1942	1945-1946	1950-1951	1955-1956	1958-1959	1961-1962
Active gins	No.	438	418	382	365	335	295	277
Seed cotton driers	No.	2	34	129	198	268	275	273
	%	1	8	34	54	80	93	99
Overhead seed cotton cleaners	No.	240	241	220	256	282	277	261
	%	55	58	58	70	84	94	94
Overhead seed cotton extractors	No.	70	84	86	113	136	207	223
	%	16	20	23	31	41	70	81
Lint cleaners	No.	0	0	0	4	166	279	276
	%	0	0	0	1	50	95	99
Fire prevention devices	No.	44	59	65	88	102	122	175
	%	10	14	17	24	30	41	63
Bales per gin (a)	No.	721	1375	1177	1108	1829	1382	1987
Gin cap. per hour	Bales	3.0	3.1	3.4	4.0	4.4	4.6	5.0
Ginning cost per bale	$	4.42	6.54	10.43	17.40	15.27	23.32	19.62

(a) Based on 28 gins, 1935-36, and 56 gins, 1941-62.

Source: B. D. Raskopf, **The Cotton Ginning Industry in Tennessee**, Tennessee Agricultural Experiment Station, Bulletin No. 303, September, 1959. Data for the 1961 crop year are based on unpublished studies made by the Tennessee Agricultural Experiment Station in cooperation with the Cotton Division, Agricultural Marketing Service, USDA.

APPENDIX N

Average gin capacity and estimated gin plant investment, by number and size of gin stand, Tennessee, 1955 and 1962

Number of gin stands and saws (a)	Gin capacity per gin per hour		Gin plants in Tennessee		Investment per plant (estimated)			
					Replacement value		For new plant	
	1955	1962	1955	1962	1955	1962	1955	1962
Type	Bales		Number		Thousand dollars			
2-70's	1.95	2.2	1	1	37	73	57	113
1-75 HC	----------	2.5	0	0	(b)	78	(b)	118
2-80's	2.5	2.8	10	3	41	82	61	122
2-90's	2.9	3.3	4	5	45	90	65	130
3-70's	2.925	3.3	17	7	45	90	65	130
3-80's	3.75	4.2	123	90	52	103	72	143
4-70's	3.9	4.4	18	11	53	106	73	146
2-80's, 1-90's	3.95	4.45	0	1	(b)	107	73	147
1-80's, 2-90's	4.15	4.7	0	1	(b)	111	75	151
3-90's	4.35	4.95	36	39	57	114	77	154
2-70's, 2-80's	4.45	5.0	1	1	58	115	78	155
2-75's HC	----------	5.0	0	3	(b)	115	(b)	155
4-80's	5.0	5.6	87	77	62	124	82	164
2-120's HC	(b)	6.0	0	1	(b)	130	(b)	170
4-90's	5.8	6.6	18	27	70	139	90	179
5-80's	6.25	7.0	7	7	73	145	93	185
2-88's HC	----------	8.0	0	1	(b)	160	(b)	200
2-8018's HC	----------	8.0	0	1	(b)	160	(b)	200
2-79's HC	----------	8.0	0	1	(b)	160	(b)	200
6-80's	7.5	----------	5	0	83	(b)	103	(b)
3-80's, 3-90's	8.1	----------	1	0	89	(b)	109	(b)
7-80's	8.75	----------	1	0	94	(b)	114	(b)
6-90's	8.7	----------	1	0	94	(b)	114	(b)
4-70's, 4-80's	8.9	----------	1	0	95	(b)	115	(b)
3-120's HC	----------	9.0	0	1	(b)	175	(b)	215
2-119's HC	----------	10.0	0	1	(b)	190	(b)	230
3-90's, 4-80's	9.35	----------	1	0	96	(b)	116	(b)
4-70's, 4-90's	9.7	----------	1	0	103	(b)	123	(b)
8-80's	10.0	----------	1	0	104	(b)	124	(b)
7-90's	10.15	----------	1	0	107	(b)	127	(b)
2-177's HC	----------	12.0	0	1	(b)	220	(b)	260
4-120's HC	----------	12.0	0	1	(b)	220	(b)	260
All gins	4.4	5.2	335	281 (c)	----------	----------	----------	----------

(a) Letters HC indicate new model stands and saws with high capacity in bales per hour.

(b) No data available.

(c) 273 active in 1962.

Source: Computed from unpublished studies made by the Tennessee Agricultural Experiment Station, 1955 to 1962, and from data on cotton gin equipment obtained annually by the Cotton Division, Agricultural Marketing Service, USDA.

APPENDIX O

Average ginning costs per running bale and bales per gin, 56 gins, Tennessee, 1941-62

Crop year	Vol. per gin	Dep. and int.	Labor	Mg't	Wrapping	Fuel and power	Repairs	Ins.	Taxes	Misc.	Total
	Bales	Dollars per bale									
1941	1375	1.00	.95	.70	1.06	.60	.78	.66	.16	.63	6.54
1942	1477	1.02	1.33	.72	1.22	.59	.62	.63	.16	.59	6.88
1943	1198	1.18	1.70	.97	1.64	.75	.82	.80	.20	.68	8.74
1944	1362	1.08	1.68	.94	1.43	.73	.62	.71	.18	.71	8.08
1945	1177	1.32	2.24	1.17	1.65	1.06	.97	.84	.21	.97	10.43
1946	1347	1.42	2.20	1.29	1.99	.95	1.06	.75	.19	.84	10.69
1947	1344	1.58	2.28	1.43	2.08	1.03	1.21	.78	.20	1.66	12.25
1948	1677	1.50	2.20	1.35	2.12	.98	.91	.70	.18	1.22	11.16
1949	1652	1.68	2.33	1.50	2.33	1.24	1.02	.78	.20	1.12	12.20
1950	1108	2.52	3.51	2.35	2.43	1.98	1.30	1.20	.31	1.80	17.40
1951	1464	1.96	2.84	1.83	2.58	1.72	1.42	.92	.25	1.59	15.11
1941-51	1380	1.48	2.11	1.30	1.87	1.06	.97	.80	.20	1.07	10.86
1952	1774	1.74	2.60	1.60	2.63	1.45	1.63	.77	.28	1.45	14.15
1953	1993	1.72	2.34	1.63	2.30	1.32	1.45	.70	.28	1.42	13.16
1954	1560	2.98	2.99	2.12	2.25	1.69	1.34	.92	.35	1.58	16.22
1955	1829	3.20	2.64	1.94	2.10	1.49	1.41	.82	.38	1.29	15.27
1956	1599	4.42	2.99	2.51	2.35	1.69	1.38	.93	.45	1.77	18.49
1957	1252	6.64	3.93	3.35	2.41	2.23	1.84	1.24	.65	2.30	24.59
1958	1382	6.24	3.73	3.25	2.40	2.17	1.70	1.23	.67	1.93	23.32
1959	2215	4.28	2.85	2.27	2.20	1.31	1.63	.91	.48	1.38	17.31
1960	2031	5.06	3.05	2.23	2.27	1.44	1.73	1.27	.58	1.10	18.73
1961	1987	5.62	2.96	2.66	2.38	1.39	1.62	1.16	.63	1.20	19.62
1962	1980	6.04	2.98	2.69	2.36	1.30	1.67	1.25	.85	1.05	20.19
1952-62	1781	4.36	3.00	2.39	2.33	1.59	1.58	1.02	.51	1.50	18.28

APPENDIX P

Proportion of cotton lint and seed purchased by ginners and other agencies, and cottonseed used on the farm, Tennessee, 1933-62

Crop year	Lint cotton				Cottonseed		
	Prod. in running bales	Bought by ginners	Bought by other merchants	Placed under gov't loan	Prod. 000 tons	Bought by ginners	Used on farm
	No.	%	%	%	No.	%	%
1933	428881	53	32	15	198	70	30
1934	396655	10	1	89	185	78	22
1935	315602	52	47	1	137	77	23
1936	422197	63	37	no loan	192	81	19
1937	633335	35	19	46	252	82	18
1938	473761	30	2	68	191	86	14
1939	432383	51	48	1	171	88	12
1940	502871	73	24	3	220	86	14
1941	574121	53	41	6	231	91	9
1942	602538	63	25	12	240	88	12
1943	479791	30	40	30	190	84	16
1944	538251	56	33	11	211	88	12
1945	449656	63	36	1	177	88	12
1946	509943	57	42	1	205	90	10
1947	507032	72	27	1	197	89	11
1948	641070	53	15	32	255	90	10
1949	622498	79	14	7	261	90	10
1950	404411	79	20	1	165	85	15
1951	525383	92	6	2	218	87	13
1952	621119	78	17	5	254	89	11
1953	685751	63	11	26	279	93	7
1954	534001	81	16	3	223	92	8
1955	613059	61	20	28	250	94	6
1956	527484	69	8	23	211	92	8
1957	404292	78	9	13	176	94	6
1958	411038	37	5	58	178	93	7
1959	642245	3	23	74	269	93	7
1960	570876	14	5	81	238	90	10
1961	550310	66	7	27	231	90	10
1962	548408	63	6	31	228	91	9
Av.	518965	56	20	24	214	88	12

Source: Compiled from the annual reports of the Bureau of the Census; Cotton Division, Agricultural Marketing Service, USDA, and Policy Program Appraisal Division, Agricultural Stabilization and Conservation Service, USDA.

3M—3-64

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