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I am submitting herewith a thesis written by John Cooper Campbell entitled "Analysis of Shipping and Receiving Cotton by Gins, Gin-Warehouses, Shippers, and Textile Mills in Tennessee." I recommend that it be accepted in partial fulfillment of the requirements for the degree of Master of Science, with a major in Agricultural Economics.

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ANALYSIS OF SHIPPING AND RECEIVING COTTON BY GINS, GIN-WAREHOUSES, SHIPPERS, AND TEXTILE MILLS IN TENNESSEE

A Thesis

Presented for the

Master of Science

Degree

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ABSTRACT

The general objective of this study was to determine the methods, problems, and costs associated with assembling cotton for shipment directly from gins and gin-warehouses to domestic mills and export outlets.

Personal interviews with 34 gins which shipped cotton directly to mills, 3 gin-warehouses, 4 textile mills, and 15 cotton shippers were conducted to collect data for the study. Data were analyzed manually and by using the SPSS computer program.

The gins' average volume was 2,428 bales in 1976. Seventy percent of the total volume of the gins surveyed were shipped directly with Tennessee textile mills being the major destination. The average volume handled by the gin-warehouses was 4,407 bales, again with Tennessee mills as the major destination.

Eight gins that made direct shipments to mills incurred additional costs averaging 34.3 cents per bale. These costs were due primarily to additional trucking expense. Labor availability was a problem in 20 gin operations. Gin-warehouses also experienced this problem.

Thirty-three gins had modified flat gin presses, while one had a standard density press and received a $1.00 per bale payment for compression. Two gin-warehouses had standard density presses, one of which received a $3.75 per bale payment.

Shippers surveyed marketed a total of 4,618,662 bales in 1975-76, of which 4,437,667 bales were handled as a shipper. The remainder was marketed by Rule 3 of the cotton trade. These shippers purchased

4,212,167 bales at local market warehouses. The other 225,500 bales were purchased at gins. The largest regional volume was purchased in the Southcentral region. Group 201 textile mills were shipped nearly 1/4 of total shipments and was the leading single destination. Approximately 56 percent of the cotton was shipped by truck and 44 percent shipped by rail. Assembly costs varied from $18.25 to $30.00 per bale depending on its location when shipped. Congestion during the peak season was a major problem.

Six shippers purchased 225,500 bales of cotton at gins. Most of this cotton was purchased in the Southcentral region. Group 201 textile mills were the leading destination. Almost 78 percent of the cotton purchased at gins was shipped by truck. Assembly costs ranged from $12.00 to $25.00 per bale. Shortage of trucks and rail cars was a major cause of shipping delays.

Four textile mills in Tennessee purchased bale cotton. They bought 101,100 bales in 1976-77, after having purchased 131,000 bales the previous year. A major portion of this cotton, 73,600 bales in 1976-77 and 105,000 bales in 1975-76, was purchased in Tennessee. Much of this cotton was shipped directly by truck in flat bales. The only problems reported were delays by railroads. Two mills forward contracted cotton.

PREFACE

This study served a twofold purpose. First, it provided a description of the movement of bale cotton within Tennessee between the gins and the mills and export outlets. Emphasis was placed on direct shipments of cotton to mills and export outlets from the gins. In order to obtain additional descriptive information, cotton shippers and cotton mill receivers were interviewed. Second, this study was a contributed project to Southern Regional Research Project S-113, "Efficiency of Identification, Assembly, and Transportation of Cotton to Mills and Export Outlets." The information provided by this study, plus that from other participating states, will be used to form a base situation for comparison with the results obtained from an optimizing model designed to analyze selected hypothetical situations regarding the assembly and transportation of bale cotton to mills and export outlets.

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CHAPTER I

COTTON PRODUCTION AND MARKETING

I. INTRODUCTION

Cotton is a major source of cash income to farmers in the United States. In addition to the producers, thousands of other persons derive their livelihood from cotton-oriented services and processing activities. The 1976 cotton crop produced $3.8 billion in revenue to farmers making cotton the fourth leading crop in the United States. An estimated 4 million people live wholly or in a very substantial part on incomes being earned directly from cotton. Another 15 million people depend on employment closely related to cotton. Over $11 billion is invested in land and equipment used to grow cotton. Billions more are invested in gins, oil mills, warehouses, textile plants, and merchandising. The 1976 crop cost $2.8 billion to produce [3].

The cotton industry is faced with various problems. These problems include shortages of labor and equipment, rising costs, competition from foreign cottons, quality maintenance and improvement, the need to find and promote new uses for cotton, and competition from manmade products [17].

The competitive relationship between cotton and competing crops for production resources has been altered significantly in recent years due to price instability and the rapid rise in farm production costs. Variable production costs per acre for producing cotton are much higher

than for competing crops. A general rise in production costs will reduce returns above variable costs for cotton relative to those for other crops, other factors equal [5].

Technological innovations have occurred frequently in recent years at all stages of the cotton marketing system. These developments have caused changes in efficiency of providing marketing services and in market organization and structure [17]. The harvest season has been shortened over the last twenty years by mechanized harvesting causing heavy strains on warehouse facilities during harvest [16].

Other changes in the physical handling and movement of cotton in recent years include rising capital requirements and a declining number of firms that operate cotton warehouses and compresses. One important change in cotton merchandising is the increase in direct shipments from producers and gins to textile mills and export outlets [10].

II. COTTON PRODUCTION

Cotton production regions are usually divided into the Southeast, Southcentral, Southwest, and West.[1] The past 20 years have seen cotton production move westward. This has caused some problems in marketing since approximately 1/2 of the total crop goes to textile mills concentrated in the Southeast [11].

Tennessee was one of 18 states in the United States where cotton

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[1]States in regions: Southeast--Alabama, Georgia, North Carolina, South Carolina, Virginia; Southcentral--Arkansas, Louisiana, Mississippi, Missouri, Tennessee; Southwest--Oklahoma, Texas; West--Arizona, California, New Mexico.

was produced in 1976. Cotton producers in the United States harvested 10,869,100 acres in 1976 which yielded 10,516,600 bales. Texas was the leading state in cotton production with 4,500,000 bales. Tennessee production in bales ranked 8th out of the 18 states. Tennessee acreage harvested ranked 7th, while yield per acre ranked 16th [12].

The cotton crop in Tennessee has been at times subject to large fluctuations in acreage and yield (Table 1). The overall trend since 1965 has been a decrease in acreage and production [14]. Unfavorable growing conditions have added to this decrease substantially during 1975 and 1976.

In 1976, 228,000 bales of cotton were produced in Tennessee on a harvested acreage of 370,000 acres. The average yield was 295 pounds of lint per acre. Cotton was grown in 27 counties with only 5 counties producing more than 20,000 bales each (Figure 1). In fact, these 5 largest-producing counties (Crockett, Haywood, Tipton, Fayette, and Gibson) produced almost 65 percent of the total Tennessee crop. Eleven of the 27 counties produced less than 1,000 bales each [13]. The value of cotton lint produced in Tennessee in 1976 was $69,385,000. Cottonseed produced was valued at $9,464,000 [12].

III. COTTON MARKETING

The cotton marketing system can be studied from the standpoint of the functional approach to marketing problems. The functional approach is a way of breaking down a complex marketing problem into individual parts to aid understanding. The marketing functions are widely classified as (1) the exchange functions--buying and selling,

Table 1. Acres Planted, Acres Harvested, Yield Per Acre, Total Volume and Value of Production of Cotton, Tennessee, 1965-1976

Year	Acres Planted (1,000's)	Acres Harvested (1,000's)	Lint Cotton (1,000's)	Lint Cotton Yield Per Acre	Value of Cotton (1,000's)	Value of Cottonseed (1,000's)	Total Value of Production (1,000's)
	Acres		Bales	Pounds	Dollars		
1965	507	499	637	611	92,531	11,730	104,261
1966	398	365	363	475	40,405	10,065	50,470
1967	336	236	145	295	20,614	3,471	24,085
1968	394	360	325	432	39,149	6,823	45,972
1969	420	400	422	505	45,047	6,657	51,704
1970	425	390	393	483	43,242	8,608	51,850
1971	447	425	528	597	70,226	11,660	81,886
1972	540	485	548	543	72,646	10,896	83,542
1973	560	440	432	472	82,390	15,296	97,686
1974	540	510	308	290	60,772	15,875	76,647
1975	335	315	222	339	54,995	8,730	63,725
1976	420	370	228	295	69,385	9,464	78,849

Source: Tennessee Department of Agriculture and Statistical Reporting Service. Tennessee Agricultural Statistics 1971, 1976, and Crop Production, May 1977..

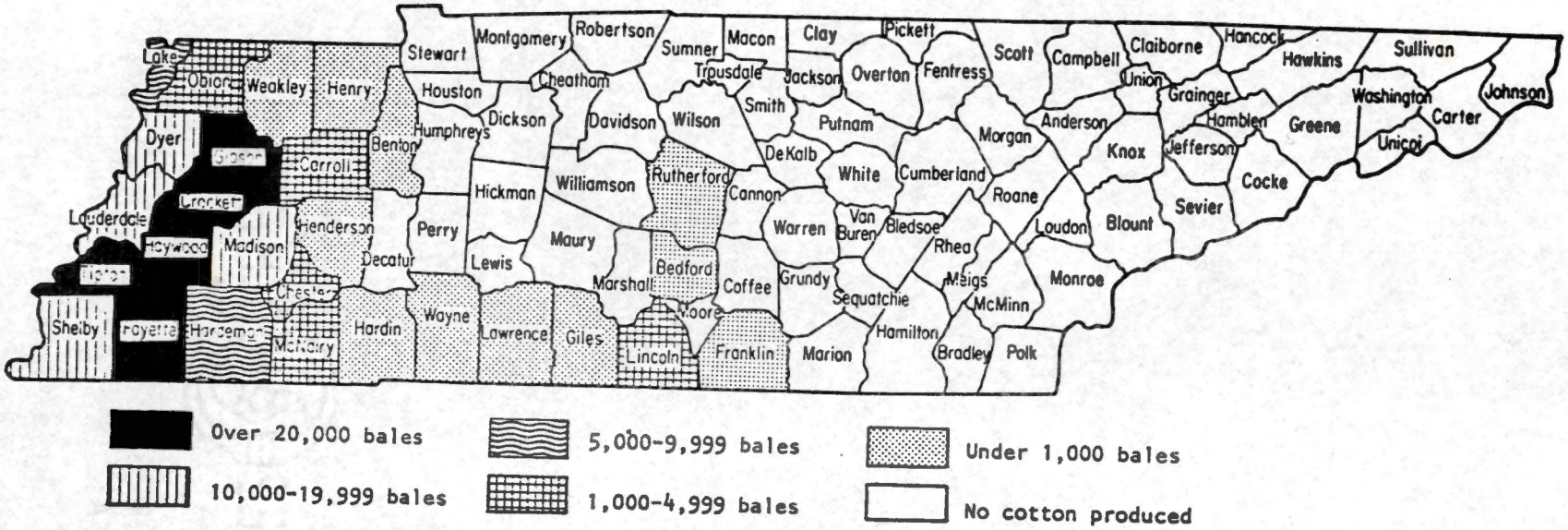


Figure 1. Cotton-producing counties in Tennessee, 1976 crop.

Source: Statistical Reporting Service, Tennessee County Estimates, 1976, U.S.D.A., June 8, 1977.

(2) physical functions--storage, transportation, and processing, and (3) facilitating functions--standardization, financing, risk-bearing, and market intelligence [10].

Gins are involved in the transportation, processing, and storage functions. Seed cotton must be hauled from the field to the gin. Most often, this is done in trailers pulled by farm-type tractors or pickup trucks. At the gin, cotton is conditioned, cleaned, and the lint is separated from the seed. The lint is packaged in bales weighing approximately 500 pounds and compressed to flat density of 12 pounds per cubic foot. Reduced harvesting time has forced ginners to increase their rate of ginning either by adding equipment or installing new equipment with higher ginning capacities. Ginners usually arrange for transportation to the warehouse. This cost is normally included in ginning charges [11].

Some cotton moves directly from the gin to mills, but most cotton moves through warehouses with compresses. Compression to higher densities, another processing function, reduces the space required for storage and transportation.[2] Cotton for domestic shipments is compressed to standard density, while export shipments are compressed to high density. There is a movement in the cotton industry to convert to a universal density bale that is suitable for both domestic and export shipments. A very small percentage is compressed to a higher density than flat density at the gin. Warehouses also perform such needed services as weighing, reconditioning bales, issuing negotiable warehouse

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[2]Standard density is compressed to 23 pounds per cubic foot. High density is compressed to 33 pounds per cubic foot. Universal density is compressed to 28 pounds per cubic foot.

receipts, sampling, and preparing cotton for shipment [11].

Firms that buy and sell cotton perform the exchange functions. These firms are classified as shippers, local merchants, mill buyers, commission buyers, and brokers. Shippers are the major link between the producer and mill. They buy cotton in lots of mixed qualities, sort it in even-running lots based on quality, and arrange for and pay the cost of transportation. Shippers assume most of the costs and risks involved in moving the cotton. Many of the other type firms aid the shippers in acquiring or selling cotton [11].

CHAPTER II

THE PROBLEM, OBJECTIVES, AND PROCEDURE OF THE STUDY

I. PROBLEM

The movement of cotton from assembly points scattered throughout production regions to export outlets and consuming mills has been a recognized problem area for many years. Increased costs and loss of sales of cotton both domestically and abroad result from the lack of adequate, prompt, and economical warehousing and transportation services and facilities. Both warehousemen and transportation agents agree that solutions to many of the problems can be identified through studies and solved with appropriate action and cooperation among warehousemen, shippers, and textile millers [16].

Researchers in the state Agricultural Experiment Stations, members of the Sisk Committee (a National Cotton Marketing Study Committee), and the United States Department of Agriculture Cotton Marketing Task Force have evaluated the situation. In order to identify areas of inefficiency and to determine means of improving the system, specific cost data on assembling and transporting cotton must be obtained. Also, specific problem areas must be identified. The present energy situation emphasizes the need for research on means of conserving energy in producing, transporting, and processing all farm products.

The Southern Regional Cotton Research Technical Committee has studied the problems of ginning cotton; the utilization of cotton by textile mills; the relationship of fiber quality to prices paid for

cotton; and contract marketing of cotton. United States Department of Agriculture researchers have studied cotton ginning, warehousing, and handling cotton in and out of storage. Researchers in individual states in the Cotton Belt have studied shippers' costs and services in marketing cotton and the cost of moving lint and cottonseed to warehouses.

Wilmeth and Bolt studied methods and equipment for handling cotton in public warehouses [18]. They found that the industrial lift truck met most satisfactorily the requirements for handling cotton in warehouses. They also found that the efficiency of most warehouse operations was increased when performed independently of another.

Chandler and Ghetti studied the cost of storing and handling cotton in warehouses [2]. Their results showed that during the 1972-73 cotton marketing season, warehouses held fee levels constant despite increased input costs.

Hudson and Cocheba studied shipping costs of cotton lint and cottonseed from gins to warehouses and oil mills in Louisiana [8]. These findings showed that ginners usually used the least-cost method of transportation that was suitable for their individual situation. However, transportation costs in many cases were unnecessarily high because ginners often shipped cotton and cottonseed longer distances than were necessary.

Boehm's study of export cotton shipments in Texas outlined the procedures involved in assembling cotton for export from Texas Gulf ports [1]. He also compared the advantages and disadvantages of truck and rail shipments.

Ghetti, Cleveland, and Stennis studied the modes of transportation used and the destinations of domestic cotton shipments for the 1975-76 season [7]. They found that 47 percent were shipped by truck and 53 percent shipped by rail. The Southeastern, Southcentral, and Western regions shipped by truck more than by rail, leaving only the Southwestern region to ship more by rail. Almost 70 percent of Southwestern cotton were shipped by rail.

Hudson, in a study of cotton utilization by textile mills, found that in 1964-65 mill buyers bought 62 percent of their raw cotton from merchants and shippers, 34 percent directly from producers, and 4 percent from Commodity Credit Corporation stocks [9]. This study also indicated that mill buyers were demanding overall higher quality cotton than shown in early studies.

None of these research projects was specifically concerned with assembling and transporting cotton from gins and warehouses to mills and export outlets or with alternative methods for reducing costs in this segment of the industry.

New methods of handling cotton that are more efficient than the ones presently used should reduce marketing costs and make cotton more cost-competitive with synthetic fibers. Thus, consumption of cotton by textile mills could increase and benefit the producer by way of higher returns and/or larger quantities consumed. Consumers could benefit from lower prices for finished products.

II. OBJECTIVES

The general objective of this study was: To determine the methods, problems, and costs associated with assembling cotton for direct shipment from gins and gin-warehouses to domestic mills and export outlets.[3]

The specific goals of this study were:

1. For gins and gin-warehouses
   a. To determine the volume and percentage of all Tennessee cotton from 1973 to 1976 shipped directly and the destination to which the cotton was shipped.
   b. To identify the procedures used for direct shipment, including additional equipment and additional labor needed solely for direct shipment.
   c. To determine any additional costs incurred from direct shipment.
   d. To identify problems associated with direct shipment and obtain ginners' recommendations for solving these problems.
2. For cotton shippers
   a. To determine the region of purchase, destination, and means of transportation for cotton handled as a shipper.
   b. To identify procedures and shippers' costs of assembling

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[3]"Direct shipment" is the movement of cotton from the gin or gin-warehouse to the mill or export outlet. Upon leaving the gin or gin-warehouse, the cotton is not stored or otherwise handled before reaching the mill or export outlet.

cotton for shipment.

c. To identify problems and obtain shippers' recommendations for solving these problems.

3. For textile mills

a. To determine volume and region of purchase of bale cotton consumed by textile mills in Tennessee.

b. To identify receiving costs and purchasing practices of mills receiving bale cotton.

c. To identify problems and obtain millers' recommendations for solving these problems.

III. PROCEDURE

Personal interviews with managers of gins and gin-warehouses, cotton buyers at textile mills, and cotton shippers were conducted during June and July 1977 to obtain relevant information concerning methods, problems, and costs associated with shipping cotton. A different questionnaire was used for each of the four types of operations. The population of gins for this study included only those which made direct shipments of cotton to mills or export outlets in 1976. A mail questionnaire was used to identify these gins, supported by information from the Memphis Cotton Classing Office concerning the gins that did not operate in 1976 and those who did not return the mail questionnaire.

Questionnaires were mailed to 186 gins. Seventy-three gins reported that no direct shipments were made during the last 4 years. Another 38 gins did not operate in 1976. Thirty gins did not respond to the mail questionnaire but they did not directly ship cotton according

to the Memphis Cotton Classing Office. A total of 45 gins made a direct shipment at least once during the 4 years from 1973 through 1976. Three of these 45 gins were classified as gin-warehouses and were studied separately. Eight gins made no direct shipments during 1976. The remaining 34 gins comprised the population of gins that made direct shipments in 1976.

Personal interviews were conducted with each of the 34 gins and 3 gin-warehouses. General and volume information were obtained from each gin surveyed. Procedures, costs, problems, and compression information were obtained from 29 gins. This discrepancy arises from the fact that some owners operated more than one gin. In those cases the questionnaire was completed for only one. In one other case, the operator was ill and could not be reached. Some volume data were not available for all 4 years due to new management not being familiar with operations all the prior years.

Completed questionnaires were obtained from each of the three gin-warehousemen. A gin-warehouse is a facility where cotton is stored for a period of time at the gin location. This operation differs from the gins which store cotton only long enough to obtain a full load shipment. Some information was not reported in as much detail as the gin information in order to prevent singling out a particular operation. General, volume, procedural, problem, and compression information were obtained from each gin-warehouse. The gin and gin-warehouse surveys were conducted in 13 counties in West Tennessee (Figure 2).

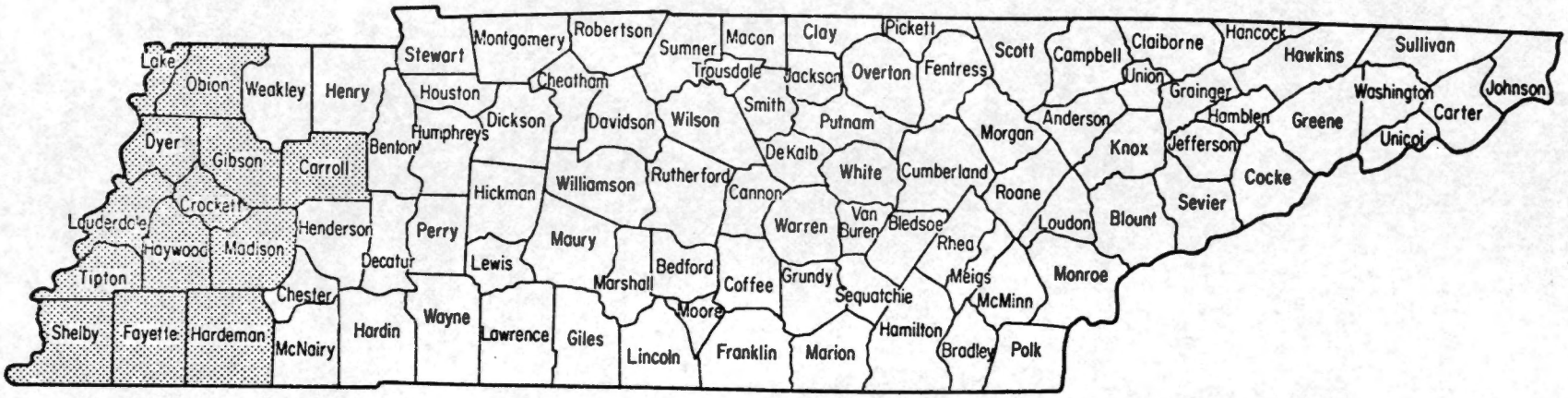


Figure 2. Counties where gins and gin-warehouses were surveyed, summer 1977.

A sample of 15 shippers out of 58 known shippers in the Memphis area were interviewed.[4,5] As many shippers as possible were interviewed considering time and cost restrictions. Data were collected concerning the 1975-76 cotton marketing season.[6] Information was obtained concerning locations of purchases, destinations of shipments, procedures and costs of assembly and transportation, and problems of assembly and transportation.

There were 144 textile mills[7] in Tennessee in 1976, but only 4 of these purchased bale cotton [4]. Cotton buyers at each of the 4 mills were interviewed concerning the 1975-76 and 1976-77 cotton marketing seasons. Information was obtained concerning volumes, regions of purchase, receiving, storage, transportation, forward contracting, purchasing practices, and fiber quality requirements.

The data collected from the gins and gin-warehouses were analyzed using the Statistical Package for the Social Sciences (SPSS). Frequency distributions, aggregation, and condescriptive data were obtained from the SPSS program. Much of the information from the textile mills and shippers could not be easily quantified. This information was summarized manually.

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[4]Nine of the shipper questionnaires were conducted by a researcher from Arkansas as part of a regional research project.

[5]Number of shippers supplied by the American Cotton Shippers Association, Memphis, Tennessee.

[6]The cotton marketing season is August 1 to July 31.

[7]One company operated two mills under the same management, so these mills were reported as one.

CHAPTER III

SURVEY RESULTS

I. GINS AND GIN-WAREHOUSES

The number of operating gins in Tennessee has dropped dramatically over the past 12 years. In 1965, 295 gins were in operation [15]. This number has been reduced to the 148 gins that operated during the 1976 cotton season. Combining the 34 gins and 3 gin-warehouses that were surveyed, they ginned 95,783 bales of cotton during the 1976-77 season. Thus, 25 percent of the operating gins ginned 42 percent of the total Tennessee cotton crop of 228,000 bales.

Gins

General information. The average age of the firm for the gins in the survey was 23 years. These firms ranged from 2 to 91 years old.

The age of the gins ranged from 3 to 47 years, with an average age of 16 years. This figure represents the age of the machinery, not the age of the building. Many ginners had installed completely new equipment but used the same building.

Three different types of ownership were reported by the ginners interviewed. Fourteen (41 percent) were partnerships, 13 (38 percent) were corporations, and the remaining 7 (21 percent) were owned by individuals.

Thirty-three of the ginners shipped all cotton by truck. Only one ginner shipped cotton directly to a mill by rail, while the cotton

sent to warehouses was shipped by truck. Very few gins were located on rail lines. Nineteen (56 percent) ginners indicated that all direct shipments were producer contracted. Part of the cotton was contracted at 11 (32 percent) gins. Only 4 (12 percent) ginners made direct shipments that were not contracted.

Mills were the predominant group in ordering cotton shipped. Twenty-two ginners (65 percent) reported shipping cotton as ordered by mills only. Mills and shippers together ordered cotton from 6 (18 percent) more gins, while 2 (6 percent) ginners reported orders by mills and merchants. The remaining 4 (12 percent) ginners reported receiving shipping orders from shippers, merchants, and producers.

Volume data. The number of ginners that made direct shipments increased in each of the years of the study. Eighteen gins made direct shipments in 1973, 21 in 1974, 28 in 1975, and 34 in 1976 (Table 2).

Volume per gin ranged from 80 to 8,120 bales in 1976. The average volume ginned per gin has been declining over the period covered by this study. In 1973, the average volume of the gins surveyed was 3,631 bales (N = 27). In 1976, the average was 2,428 bales (N = 34). This decrease was due largely to lower than average yields in recent years. The percentage of the total volume and the number of bales shipped directly had increased in each of the years for which data were obtained. In 1973, 45 percent of the total volume of the gins surveyed was shipped directly. This volume had increased to 55 percent, 64 percent, and 70 percent in 1974, 1975, and 1976, respectively. The number of bales had increased from 44,343 in 1973; to 50,405 in 1974; 53,387 in 1975; and

Table 2. Number of Gins, Total Volume, Average Gin Volume, Number of Gins Making Direct Shipments, Volume of Direct Shipments, Average Volume of Direct Shipments, and Percent of Volume in Direct Shipments, Tennessee, 1973-1976

Year	Gins	Total Volume	Average Gin Volume	Gins Making Direct Shipments	Volume of Direct Shipments	Average Volume of Direct Shipments	Volume in Direct Shipments
	Number	-------Bales-------		--Number-	---------Bales----------		-Percent-
1973	27[a]	98,039	3,631	18	44,343	2,464	45
1974	30[b]	91,119	3,037	21	50,405	2,400	55
1975	34	83,043	2,442	28	53,287	1,903	64
1976	34	82,583	2,428	34	57,845	1,701	70

[a]Seven gins were unable to provide the requested information for 1973.

[b]Four gins were unable to provide the requested information for 1974.

57,845 in 1976. As had average volume ginned, the average number of bales shipped directly (counting only those gins which made direct shipments) had dropped from 2,464 (N = 18) in 1973 to 1,701 (N = 34) in 1976.

A major portion of direct shipments in Tennessee was bought by textile mills in Tennessee (Table 3). These consuming mills were located in or near the major cotton production areas. In 1973, 30,043 bales were shipped to Tennessee mills, followed by 37,350 in 1974; 42,717 in 1975; and 39,691 in 1976. Mills in the Carolinas were shipped 14,300 bales in 1973; 11,295 in 1974; 6,050 in 1975; and 6,030 in 1976. A combination of Carolina and Georgia mills was shipped 1,760 bales in 1974; 4,520 in 1975; and 12,124 in 1976.[8] None of the ginners in Tennessee made any direct shipments to an export outlet.

Procedures, equipment, and labor. Only 2 of the 29 gins from which procedural information was obtained handled direct shipments differently from cotton shipped to a warehouse. Seven ginners indicated more office work was required to handle direct shipments, 5 reported less, and 17 reported no difference.

One of the ginners that reported a difference in handling procedures moved the cotton to a storage area from the press. This procedure required two men, a forklift, and a truck. The two men loaded

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[8]Cotton shipped to the Carolinas and Georgia was so classified because this cotton was bought primarily by a shipper who accepted the cotton f.o.b. the gin. The gins did not keep exact records as to where the cotton was shipped, but they knew it was shipped to the North and South Carolina and Georgia areas.

Table 3. Destinations of Direct Shipments of Cotton to Textile Mills from 34 Cotton Gins, Tennessee, 1973-1976

Year	Total Volume Direct Shipments	Volume Shipped to Tennessee Mills	Volume Shipped to the Carolinas	Volume Shipped to the Carolinas and Georgia[a]
	----------	Bales	----------	
1973	44,343	30,043	14,300	0
1974	50,405	37,350	11,295	1,760
1975	53,287	42,717	6,050	4,520
1976	57,845	39,691	6,030	12,124

[a]Cotton shipped to the Carolinas and Georgia was so classified because this cotton was bought primarily by a shipper who accepted the cotton f.o.b. the gin. The ginners did not keep exact records as to where the cotton was shipped but knew it was shipped to the North and South Carolina and Georgia areas.

the cotton on the truck for transporting to storage. The cotton was then unloaded and placed in storage where it remained until loaded for shipment to the mill. Other cotton from this gin that was shipped to a warehouse was loaded directly on trucks.

The difference in handling procedures of the other gin stemmed from direct shipments being shipped by rail. Cotton moved to warehouses was shipped by truck. At this gin, the cotton was moved from the press to temporary storage on the loading platform. Movement from the press to the platform required one man pushing a handtruck. The cotton remained on this platform until a car load was ready to be shipped. One man operating a forklift loaded the cotton on rail cars.

The other 27 ginners used three different procedures in handling cotton regardless of where the cotton was shipped. Five ginners reported cotton moved directly from the press into the means of transportation. Cotton at two gins went directly to a storage area. Twenty-two ginners used the most common procedure of storing cotton temporarily on the loading platform.[9]

For the five ginners that moved cotton directly to the truck, three used a combination of a handtruck and electric hoist to load the cotton. One used a forklift and one used only a handtruck. Two gins used one man to complete this job, while the other three used two men each.

The two ginners that moved cotton to storage stored the cotton in

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[9]Total adds to more than 27 since 2 gins used more than one procedure.

a bale house adjacent to the gin. Each used one man and a handtruck to move cotton from the press to the bale house. Both ginners removed the cotton from storage directly to the truck when shipment was made. One ginner used an electric hoist for break-out and loading. The other used both a handtruck and an electric hoist. A two-man crew was used by each ginner to complete this job.

Of the 22 gins that stored cotton temporarily on the loading platform, 19 used a handtruck to transport cotton from the press. One used an automatic pusher and forklift, one a handtruck and forklift, and one a forklift. Twenty-one ginners used only one man for this job. One ginner used two men. Fourteen ginners loaded trucks from the platform with an electric hoist, 6 with a forklift, and 2 with a combination of handtruck and electric hoist. Eleven ginners used one man to load trucks, 9 used two, and 2 used three men to load.

Costs. The cost data that were obtained included only those additional costs incurred as a result of direct shipments of cotton (Table 4). Only eight gins, representing 12,119 bales shipped directly, reported any additional costs. The bulk of these additional costs was due to cotton being hauled longer distances when shipped directly to the mill. Six ginners reported additional trucking costs totaling $2,899.98 for the six gins. These ginners shipped 8,330 bales directly for an average additional trucking cost of 34.8 cents per bale. Three ginners paid additional insurance cost of $550.00 on 3,509 bales for an average of 15.6 cents per bale. Additional cost for moving cotton into temporary storage was $704.72 for two gins (18.6 cents per bale on

Table 4. Additional Costs Incurred by 34 Gins for Direct Shipments to Textile Mills, Tennessee, 1976

Cost Category	Gins	Bales	Amount	Cost Per Gin	Cost Per Bale
	-----Number----		----------Dollars----------		
			Additional Variable Costs		
Trucking	6	8,330	2,899.98	483.33	.348
Insurance	3	3,509	550.00	188.33	.156
Storage Labor	2	3,789	704.72	352.36	.186
Break-Out Labor	1	109	6.90	6.90	.063
Totals[a]	8	12,119	4,161.60	520.20	.343

[a]Totals are not composite because some gins incurred more than one type of cost.

3,789 bales). One gin reported additional break-out labor of $6.90 on 109 bales (6.3 cents per bale). Two gins which shipped 6,630 bales spent $9,410 on additional facilities and equipment. Both built additional loading areas, while one purchased a forklift.

Problem areas. The gin operators were asked to comment on various problem areas associated with their operations (Table 5). Twenty of 29 ginners responded that labor availability was a problem. In some cases, labor availability was considered a very serious problem. Reasons given for labor problems included seasonal work (16 gave this reason), welfare payments (7), lazy people (4), hard work (2), incompetent workers (2), and high turnover (1).[10] Some gins had brought Mexican workers in during the ginning season, while one gin had considered getting trustees from the county jail.

Only one ginner reported delays in shipping an order due to lack of volume to fill a lot as ordered. This particular ginner only shipped directly the cotton belonging to four or five producers who had contracted their cotton. Delays were encountered when unfavorable weather conditions held up the harvest of these few producers. For this reason, the ginner indicated that he did not intend to ship any cotton directly during the 1977 season. The main reason that other ginners did not have a problem in filling a lot as ordered was that direct cotton was usually sold "gin-run" to mills and shippers.[11]

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[10] Total adds to more than 20 since some ginners gave more than one reason.

[11] Buying cotton "gin-run" is buying cotton as it leaves the press without being grouped into lots of similar grade and staple length.

Table 5. Responses to Questions About Problem Areas in 34 Gin Operations,[a] Tennessee, 1976

Problem Areas	Yes	No
1. Is labor availability a problem?	20	9
2. Are there delays in shipping an order due to lack of volume to fill a lot as ordered?	1	28
3. Are there any special equipment problems associated with shipping cotton direct to mills or export outlets?	0	29
4. Are there problems with getting equipment repaired in a reasonable time?	5	24
5. Are there any delays in shipping due to a lack of means of transportation?	8	21
6. Is the equipment available for your needs?	29	0

[a]This information was obtained from only 29 gins.

No ginner indicated any special equipment problems associated with direct shipments. All ginners reported that the equipment they needed was available. Only five had problems in getting equipment repaired in a reasonable time. These problems mainly involved getting a repairman at the exact time he was needed. Most of the ginners did as much of their own repair work as possible.

Eight of the 29 ginners reported delays in shipping due to a lack of transporting vehicles. Most of those problems were related to contract haulers' failure to be on schedule. The ginners that had no problems with transportation either had reliable contractors or owned their own trucks. The one ginner that shipped by rail did not report a problem in obtaining rail cars.

Six ginners reported some additional problems associated with direct shipments. Four indicated that when cotton was being shipped to more than one location, there had been problems in keeping it separated and making sure it was shipped to the right place. One ginner was not sure whose insurance covered the cotton in transport. Another experienced some problem concerned with keeping his money tied up longer on the cotton he owned than if shipped to a warehouse.

Overall, the ginners interviewed preferred to make direct shipments. Preference for direct shipments was especially true when shippers accepted the cotton f.o.b. the gin. Since the shipper paid the cost of transportation, the ginners actually reduced costs. Many of the other gins were located about equal distances from the warehouses and mills, so no additional cost was involved. The producer also saved money by-passing the warehouse. This warehouse charge amounted to $2.27 per

bale in 1976 for receiving, first month's storage, and insurance. Some mills also paid a price premium on contracts to get cotton shipped directly.

Compression information. All but one gin had modified flat gin presses.[12] One gin had a standard density press and did not charge producers for compression. Mills and shippers paid a $1.00 compression charge to the gin with the standard density press.

The mills that received direct shipments from Tennessee gins accepted flat bales. Most of the gins that made direct shipments to mills did not handle the volume needed to justify the high investment required for installing a universal density press. Total investment for the universal density press would be around $265,000. Assuming a $3.00-per-bale compression allowance for universal density bales, a 12-bale-per-hour gin would have to gin 3,850 bales to break even on installing a new universal density press [6]. The average volume ginned by the gins in the survey of 2,428 bales does not allow for the volume needed for the universal density press to be profitable.

Gin-Warehouses

General information. The average age for the gin-warehouse firms was 49 years. The average facility age was 4.3 years, each one having relatively new equipment. The three gin-warehouses were owned by

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[12] Modified flat gin press--a flat gin press box converted to form a bale 24 inches wide and 54 inches high. This produces a bale that can be compressed to universal density and size.

corporations. One gin-warehouse shipped by both truck and rail. The other two were adjacent to textile mills where a major portion of their cotton was used. Part of the cotton at each facility was contracted. Mills ordered cotton shipped from two of the gin-warehouses. Mills and merchants ordered from the other gin-warehouse. All cotton from each gin-warehouse was utilized directly by mills or shipped to mills and export outlets each of the 4 years covered by this study.

Volume data. As one would expect from the previous discussion of ginning volumes, the number of bales ginned by the gin-warehouses had declined in recent years. The average volume had dropped from 7,900 bales in 1973 to 6,450 in 1974; 4,940 in 1975; and 4,407 in 1976. The gin-warehouses ginned a total volume of 23,700; 19,352; 14,820; and 13,220 bales in 1973, 1974, 1975, and 1976, respectively (Table 6).

Tennessee mills were also the major destination of cotton ginned at the three gin-warehouses, with the Carolinas being second in importance (Table 6). Cotton shipped to Tennessee mills amounted to 12,700 bales in 1973; 11,200 in 1974; 9,000 in 1975; 7,200 in 1976. Mills in North and South Carolina were shipped 5,500 bales in 1973; 4,075 in 1974; 2,910 in 1975; and 3,010 in 1976. Georgia textile mills were shipped 2,200 bales in 1973, followed by 1,630; 1,165; and 1,204 in 1975, 1975, and 1976, respectively. In 1973, 2,200 bales were shipped to other mill areas, 1,630 in 1974; 1,165 in 1975; and 1,204 in 1976.[13] The gin-warehouses shipped 1,100 bales to New Orleans ports for export

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[13]Other mill areas include Alabama, Virginia, Mississippi, New England, etc.

Table 6. Total Volume, Average Gin-Warehouse Volume, and Destinations of Cotton Shipped from Three Gin-Warehouses, Tennessee, 1973-1976

Year	Total Volume	Average Gin-Warehouse Volume	Volume Shipped to Tennessee Mills	Volume Shipped to the Carolinas	Volume Shipped to Georgia	Volume Shipped to Other States[a]	Volume Shipped to New Orleans Ports
	Bales						
1973	23,700	7,900	12,700	5,500	2,200	2,200	1,100
1974	19,352	6,450	11,200	4,075	1,630	1,630	817
1975	14,820	4,940	9,000	2,910	1,165	1,165	580
1976	13,220	4,407	7,200	3,010	1,204	1,204	602

[a]Other states include Alabama, Virginia, Mississippi, New England, etc.

in 1973, 817 in 1974, 580 in 1975, and 602 in 1976.

Procedures, equipment, and labor. The three gin-warehousemen used similar procedures in handling cotton. Two moved the cotton directly from the press to the warehouse with a forklift. This method required only one worker. The other facility hauled the cotton to the warehouse. This procedure involved three or four men. The cotton was loaded on a truck with a forklift and hauled to the warehouse. The gin-warehouseman that shipped cotton to various mills used one man on a forklift to break-out and assemble the bales into the lots that had been ordered. Later, when the transporting vehicle arrived, the cotton was loaded with the forklift.

Problem areas. Two of the three gin-warehousemen reported the problem of labor availability. These problems usually arose with shortages in the gin crew, since some warehouse employees worked year round. Seasonal work and unreliable help were the main reasons given for labor shortages.

None of the gin-warehousemen had delays in shipping due to the inability to fill a lot order. Two of these facilities sent all cotton to the textile mill on a common location. The other facility received future shipping dates from the buyers of the cotton so that the cotton for shipment was ready on time.

No special equipment problem was reported by the gin-warehousemen. All three had employees who did most of the repair work, so getting equipment repaired in a reasonable time was not a problem. Each warehouseman indicated that the types of equipment that they needed were readily available.

Only the gin-warehouseman that shipped cotton to mills at distant locations had a problem with transportation. The problem was in obtaining box cars for rail shipment. No problem was encountered when the cotton was shipped by truck.

Compression information. Two of the gin-warehouses had standard density presses, while the other facility had a flat gin press. One of the operations with the standard density press charged $3.75 per bale for compression. This charge was normally paid by the buyer of the cotton.

II. SHIPPERS

The 15 shippers interviewed handled a total of 4,618,662 bales. The volume marketed by each firm ranged from 2,000 bales to 1,555,500 bales. Of the total volume, 4,437,668 (96 percent) bales were handled by the group as shippers. The remaining 108,995 (4 percent) bales were marketed by Rule 3.[14] The 4,437,667 bales handled by the group as shippers represented 54 percent of the entire United States' 1975-76 cotton crop of 8,247,100 bales [12].

More shippers bought cotton in the Southcentral region than any other production region. Fourteen shippers handled cotton from the Southcentral region, 9 handled cotton from the West, 7 from the Southwest, and 5 from the Southeast. Five shippers bought cotton from all four regions. Five more shippers bought cotton from only the Southcentral

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[14] A rule of the cotton trade that applies when the buyer agrees to accept original weights and samples. Rule 3 stipulates the rights and responsibilities of each party to the sale. Rule 3 provides regulations for the acceptance of original weights and samples and the time period within which weights and samples must be provided to the buyer.

region. Two bought cotton from both the Southcentral and West regions. One bought from a combination of Southcentral, Southwest, and West assembly points, while one purchased cotton from the Southcentral and Southwest regions. One shipper purchased cotton in only the West region.

Considering the volume of cotton purchased, 1,806,706 bales were shipped from Southcentral collecting points (Table 7). The Southwest and West regions were next in importance with respect to volume, since 1,104,062 bales and 1,091,788 bales were purchased from each region, respectively. The smallest regional volume, 435,111 bales, was purchased from the Southeast.

Cotton was purchased by shippers at gins and local market warehouses. Only 225,500 (5 percent) bales were bought at gins (Table 7), while 4,212,167 (95 percent) bales were purchased at local market warehouses. More cotton was bought at gins in the Southcentral region than in any other region. No cotton was bought at gins in the Southwest, while small amounts were purchased at gins in the Southeast and West. Six of the 15 shippers bought cotton at gins, while 14 bought cotton located at local market warehouses.

Cotton Purchased at Local Market Warehouses

Volume and destination data. The 14 shippers that purchased cotton at local market warehouses bought 4,212,167 bales (Table 7). The largest regional volume, 1,631,206 bales, was purchased at warehouses in the Southcentral region. The Southwest was second in importance and the West third with over 1 million bales purchased in each region. Only 425,111 bales were purchased at warehouses in the Southeast.

Table 7. Number of Shippers, Number of Bales, and Percent of Total Bales by Region for All Cotton Purchased at Local Market Warehouses and at Gins, 1975-76 Cotton Marketing Season

Region Where Purchased[a]	All Cotton Purchased			Cotton Purchased From Local Market Warehouses			Cotton Purchased From Gins		
	Number of Shippers	Number of Bales	Percent of Total	Number of Shippers	Number of Bales	Percent of Total	Number of Shippers	Number of Bales	Percent of Total
Southeast	4	435,111	9.8	5	425,111	9.6	1	10,000	.2
Southcentral	14	1,806,706	40.7	14	1,631,206	36.7	5	175,500	4.0
Southwest	7	1,104,062	24.9	7	1,104,062	24.9	0	0	0
West	9	1,091,788	24.6	8	1,051,788	23.7	1	40,000	.9
Total	15	4,437,667	100.0	14	4,212,167	94.9	6	225,500	5.1

[a]States in regions: Southeast--Alabama, Georgia, North Carolina, South Carolina, Virginia; Southcentral--Arkansas, Louisiana, Mississippi, Missouri, Tennessee; Southwest--Oklahoma, Texas; West--Arizona, California, New Mexico.

For the total of all regions, slightly over 55 percent of the total volume was shipped to domestic mills (Table 8). Group 201 textile mills received nearly 1/4 of the total shipments making them the leading destination.[15] California ports were the second leading destination, being shipped 17 percent of the total. Alabama-Georgia textile mills were shipped 16 percent of the total volume purchased at local market warehouses in 1975-76 by the 15 surveyed shippers.

Almost 97 percent of the total shipped from the Southeast region were shipped to domestic mills (Table 9). Alabama-Georgia mills were shipped slightly over 54 percent of the 425,111 bales purchased in the Southeast. Approximately 27 percent of the Southeastern cotton were shipped to Group 201 mills, while almost 16 percent were shipped to Group 200 mills. Only 13,089 (3 percent) bales were shipped to ports from the Southeast.

Over 81 percent of the cotton that the surveyed shippers purchased in the Southcentral region were shipped to domestic mills (Table 10). Almost 41 percent of the Southcentral cotton were shipped to Group 201 mills. Group 200 textile mills was the second leading destination being shipped 24 percent of the total. Alabama-Georgia mills and Louisiana-Mississippi-Alabama ports followed with 16 percent and 15 percent, respectively.

Texas Gulf ports were the major destinations of cotton purchased by the shippers from local market warehouses in the Southwest region

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[15]Group 200 textile mills represent the primary mill locations in the eastern half of North and South Carolina. Group 201 mills represent the primary mill locations in the western half of North and South Carolina.

Table 8. Destination and Quantity of Cotton Purchased by 15 Tennessee Shippers at Local Market Warehouses by Mode of Transportation, 1975-76 Cotton Marketing Season

Destination	Quantity of Cotton Shipped By Truck	Shipped By Rail	Total Shipped	Total Shipments
	----------Bales----------			-Percent-
Domestic Mills				
200 Mills[a]	281,184	308,256	589,440	14.0
201 Mills[a]	456,761	582.376	1,039,137	24.7
Alabama-Georgia Mills	339,132	333,973	673,105	16.0
Tennessee Mills	16,500	8,463	24,963	.6
Total Mill Shipments	1,093,577	1,233,068	2,326,645	55.3
Ports for Export				
Texas Gulf Ports	158,108	376,982	535,090	12.7
Louisiana, Mississippi, Alabama Ports	232,468	10,920	243,388	5.8
California Ports	615,033	103,172	718,205	17.0
Atlantic Ports	0	13,089	13,089	.3
Total Port Shipments	1,005,609	504,163	1,509,772	35.8
Mini-Land Bridge[b]	258,367	117,383	375,750	8.9
Total Shipments	2,357,553	1,854,614	4,212,167	100.0

[a]Group 200 mills represent the primary mill locations in the eastern half of North and South Carolina. Group 201 mills represent the primary mill locations in the western half of North and South Carolina.

[b]Mini-Land Bridge--A service instituted whereby cargo, including cotton, is transported via rail in containers on flat cars from one coast to another to be loaded in all-container vessels. As an example, cotton can be loaded in containers adjacent to Gulf ports and transported via rail to California and East Coast ports for export in container vessels. This is an alternative service which normally provides the same rates as if the cotton had been loaded break bulk in vessels providng all-water service from Gulf ports. The steamship carrier absorbs the inland transportation costs in the overall rate structure and provides the steamship carrier with certain advantages, including better utilization by balancing their container fleets and providing them with fewer port calls at U.S. ports. The cotton is delivered to the mini-land bridge by both truck and rail as in delivering to mills and ports.

Table 9. Destination and Quantity of Cotton Purchased by 15 Tennessee[a] Shippers at Local Market Warehouses in the Southeast Region, by Mode of Transportation, 1975-76 Cotton Marketing Season

Destination	Quantity of Cotton			
	Shipped By Truck	Shipped By Rail	Total Shipped	Total Shipments
	----------Bales----------			-Percent-
Domestic Mills				
200 Mills[b]	54,049	12,151	66,200	15.5
201 Mills[b]	100,600	14,601	115,201	27.1
Alabama-Georgia Mills	142,350	87,945	230,295	54.2
Tennessee Mills	0	325	326	.1
Total Mill Shipments	296,999	115,023	412,022	96.9
Ports for Export				
Atlantic Ports	0	13,089	13,089	3.1
Total Shipments	296,999	128,112	425,111	100.0

[a]States in Southeast Region--Alabama, Georgia, North Carolina, South Carolina, Virginia.

[b]Group 200 mills represent the primary mill locations in the eastern half of North and South Carolina. Group 201 mills represent the primary mill locations in the western half of North and South Carolina.

Table 10. Destination and Quantity of Cotton Purchased by 15 Tennessee Shippers at Local Market Warehouses in the Southcentral Region,[a] by Mode of Transportation, 1975-76 Cotton Marketing Season

Destination	Quantity of Cotton Shipped By Truck	Shipped By Rail	Total Shipped	Total Shipments
	----------Bales----------			-Percent-
Domestic Mills				
200 Mills[b]	212,999	175,045	388,044	23.8
201 Mills[b]	337,171	325,329	662,500	40.6
Alabama-Georgia Mills	177,968	83,316	261,284	16.0
Tennessee Mills	16,500	900	17,400	1.1
Total Mill Shipments	744,638	584,590	1,329,228	81.5
Ports for Export				
Texas Gulf Ports	19,925	36,415	56,340	3.5
Louisiana, Mississippi, Alabama Ports	232,468	10,920	243,388	14.9
California Ports	1,800	450	2,250	.1
Total Port Shipments	254,193	47,785	301,978	18.5
Total Shipments	998,831	632,375	1,631,206	100.0

[a]States in Southcentral Region--Arkansas, Louisiana, Mississippi, Missouri, Tennessee.

[b]Group 200 mills represent the primary mill locations in the eastern half of North and South Carolina. Group 201 mills represent the primary mill locations in the western half of North and South Carolina.

(Table 11). More cotton was shipped to ports from the Southwest than to domestic mills. Almost 46 percent of the total went to ports, of which 43 percent of the total were shipped to Texas Gulf ports. Mini-land bridges were shipped slightly over 28 percent of the Southwest cotton to be the second leading destination of cotton from this region.[16] Almost 12 percent were shipped to Alabama-Georgia mills.

California ports were the primary recipient of cotton shipped from the West being shipped almost 66 percent of the cotton from that region (Table 12). Group 201 mills received almost 16 percent and Group 200 mills almost 8 percent of the cotton purchased in the West.

More cotton was shipped by truck than by rail from the Southeast, Southcentral, and West regions. However, for cotton shipped from in the Southwest, more was shipped by rail than by truck. The distribution of the total volume handled by the shippers surveyed was 56 percent shipped by truck and 44 percent shipped by rail. The Southeast had the highest percentage share of truck shipments, 70 percent. Rail shipments from the Southwest amounted to 63 percent of the total volume from that region.

Procedures and costs of assembly and shipment. The procedure followed by shippers in assembling cotton for shipment began when the cotton was purchased by the shipper or his agent. The shipper received samples of all the cotton he had purchased. He classed the cotton and grouped it in even-running lots of 80 to 100 bales for truck shipments

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[16] Mini-land bridge--a service whereby cargo is transported via rail in containers on flat cars from one coast to another to be loaded in all-container vessels.

Table 11. Destinations and Quantity of Cotton Purchased by 15 Tennessee Shippers at Local Market Warehouses in the Southwest Region,[a] by Mode of Transportation, 1975-76 Cotton Marketing Season

Destination	Quantity of Cotton			
	Shipped By Truck	Shipped By Rail	Total Shipped	Total Shipments
	----------Bales----------			-Percent-
Domestic Mills				
200 Mills[b]	12,666	42,353	55,019	5.0
201 Mills[b]	17,520	79,289	96,809	8.8
Alabama-Georgia Mills	18,079	112,445	130,524	11.8
Tennessee Mills	0	1,910	1,910	.2
Total Mill Shipments	48,265	235,997	284,262	25.8
Ports for Export				
Texas Gulf Ports	138,183	340,567	478,750	43.4
California Ports	19,800	7,200	27,000	2.4
Total Port Shipments	157,983	347,767	505,750	45.8
Mini-Land Bridge[c]	197,525	116,525	314,050	28.4
Total Shipments	403,773	700,289	1,104,062	100.0

[a]States in Southwest Region--Oklahoma, Texas.

[b]Group 200 mills represent the primary mill locations in the eastern half of North and South Carolina. Group 201 mills represent the primary mill locations in the western half of North and South Carolina.

[c]Mini-Land Bridge--A service instituted whereby cargo, including cotton, is transported via rail in containers on flat cars from one coast to another to be loaded in all-container vessels. As an example, cotton can be loaded in containers adjacent to Gulf ports and transported via rail to California and East Coast ports for export in container vessels. This is an alternative service which normally provides all-water service from Gulf ports. The steamship carrier absorbs the inland transportation costs in the overall rate structure and provides the steamship carrier with certain advantages, including better utilization by balancing their container fleets and providing them with fewer port calls at U.S. ports. The cotton is delivered to the mini-land bridge by both truck and rail as in delivering to mills and ports.

Table 12. Destinations and Quantity of Cotton Purchased by 15 Tennessee Shippers at Local Market Warehouses in the West Region,[a] by Mode of Transportation, 1975-76 Cotton Marketing Season

Destination	Quantity of Cotton Shipped By Truck	Shipped By Rail	Total Shipped	Total Shipments
		-Bales-		-Percent-
Domestic Mills				
200 Mills[b]	1,470	78,707	80,177	7.6
201 Mills[b]	1,470	163,157	164,627	15.7
Alabama-Georgia Mills	735	50,267	51,002	4.8
Tennessee Mills	0	5,327	5,327	.5
Total Mill Shipments	3,675	297,458	301,133	28.6
Ports for Export				
California Ports	593,433	95,522	688,955	65.5
Mini-Land Bridge	60,842	858	61,700	5.9
Total Shipments	657,950	393,838	1,051,788	100.0

[a]States in West Region--Arizona, California, New Mexico.

[b]Group 200 mills represent the primary mill locations in the eastern half of North and South Carolina. Group 201 mills represent the primary mill locations in the western half of North and South Carolina.

[c]Mini-Land Bridge--A service instituted whereby cargo, including cotton, is transported via rail in containers on flat cars from one coast to another to be loaded in all-container vessels. As an example, cotton can be loaded in containers adjacent to Gulf ports and transported via rail to California and East Coast ports for export in container vessels. This is an alternative service which normally provides the same rates as if the cotton had been loaded break bulk in vessels providing all-water service from Gulf ports. The steamship carrier absorbs the inland transportation costs in the overall rate structure and provides the steamship carrier with certain advantages, including better utilization by balancing their container fleets and providing them with fewer port calls at U.S. ports. The cotton is delivered to the mini-land bridge by both truck and rail as in delivering to mills and ports.

and 150 bales for rail shipments. After selling the cotton, the shipper sent the bonded warehouse receipts to the warehouse for the cotton to be shipped. The shipper notified the warehouse as to shipping instructions. Either the warehouse or the shipper arranged for shipment. When the cotton was loaded, the warehouse forwarded an accepted bill of lading to the shipper. The shipper then billed the buyer of the cotton and received payment when the cotton reached its destination.

Costs of assembly and shipment of cotton reported by the shippers varied with the region from which the cotton was shipped. Six shippers did not give cost data. Costs for cotton shipped from the Southcentral region varied from $18.25 to $23.75 per bale (Table 13). Assembly and shipment of cotton from the Southwest to Southeastern textile mills ranged from $21.50 to $25.00 per bale. West cotton shipped to California ports cost about $22.50 per bale to assemble and ship, while Western cotton shipped to Southeastern mills cost approximately $30.00 per bale. Assembly and shipment costs for cotton purchased in the Southeast were $13.75 to $16.00 per bale. Lower freight costs gave this region the lowest costs. Freight, ranging from $3.25 to $10.00 per bale, was usually the largest component of the total cost of assembly. Compression charges ($3.00 to $3.75 per bale), loading out ($2.80 to $3.00), and receiving ($2.75) were other major components of assembly cost.

Shippers preferred to assemble cotton in full load lots. Shipping in full load lots usually reduced freight cost per bale and made the assembly and transportation processes function more smoothly. Five of the 14 shippers who purchased cotton at local market warehouses said that all cotton that they bought was assembled in full load lots. Five more

Table 13. Costs Incurred by 15 Tennessee Shippers for Assembling and Shipping Cotton from Production Regions to Mills and Export Outlets, 1975-76 Cotton Marketing Season

Item	Cost Per Bale
	---Dollars---
Freight	3.25-10.00
Compression	3.00-3.75
Loading Out	2.80-3.00
Receiving	2.75
Interest	2.00
Buying Commission	1.00-1.50
Storage[a]	1.00
Collection of Payment	1.00
Futures Charge[b]	0.35-0.65
Cotton Exchange Fee[c]	0.30
Insurance	0.20-0.75
Bale Fee[d]	0.10
Collateral	0.10
Sampling	0.10-0.45
Total Costs By Region[e]	
Southeast	13.75-16.00
Southcentral	18.75-23.75
Southwest	21.25-25.00
West	22.50-30.00

[a]Storage--Total storage cost per bale.

[b]Futures Charge--Cost incurred from hedging cotton purchases on the futures market.

[c]Cotton Exchange Fee--Fee for membership in the New York Cotton Exchange.

[d]Bale Fee--Fee for membership in various trade organizations of the cotton industry.

[e]States in Regions: Southeast--Alabama, Georgia, North Carolina, South Carolina, Virginia; Southcentral--Arkansas, Louisiana, Mississippi, Missouri, Tennessee; Southwest--Oklahoma, Texas; West--Arizona, California, New Mexico.

reported between 90 percent and 99 percent were assembled in full load lots.

Cotton purchased in less than full load lots was usually combined with other cotton to complete the load. Most often, cotton owned by the same shipper, but located at another warehouse, was used to complete the load. Occasionally, cotton owned by two shippers was combined at the same location. Railroads were reluctant to combine cotton at different locations, so the major portion of cotton assembled in less than full load lots was shipped by truck.

Sometimes additional costs were incurred when assembling cotton in less than full load lots. Usually these costs involved extra charges by truckers for loading at more than one location. Eight shippers reported additional costs for transportation. These costs varied depending on the number of stops and the distance between locations. The shippers reported costs ranging from $0.50 to $0.75 per bale. No shipper reported any additional charge at the warehouses.

Problems of assembly and shipment. The shippers who were interviewed were asked to discuss assembly problems specific to region and means of transportation. Only one shipper of the 14 who purchased cotton at local market warehouses reported no problem in assembling cotton. More problems were reported for the Southcentral region, since more shippers purchased cotton in that region than any other. Generally, many of the same problems were reported regardless of the mode of transportation.

The most prevalent problem reported in the Southcentral region was warehousemen's failure to ship cotton on time during the peak season.

The warehouses were often overloaded, and congestion was a major problem. Eight shippers reported congestion as a problem for truck shipments as did seven for rail shipments. A closely related problem was that some shippers felt warehousemen were more interested in receiving new cotton for storage than in shipping cotton out. Two shippers reported this problem for both truck and rail shipments.

Three shippers reported truck shortages as a problem, especially when cotton and grain were being shipped during the same period. Five shippers reported problems in obtaining rail cars. Other problems concerning truck shipments included (1) penalties for requiring more than one warehouse stop, (2) some millers' refusal to unload trucks on weekends, and (3) the use of too many different types of bagging. Other problems in assembling rail shipments were (1) difficulties in consolidating less than full load lots and (2) delays in obtaining empty box cars.

Three shippers also reported problems with barge shipments from the Southcentral region. These problems occurred mainly as the result of large volume requirements to fill a barge and the longer transportation time which delayed payment to the shippers. Some barge shipments were as large as 15,000 bales.

In the Southeast, shortages of trucks and rail cars were a problem for one shipper for truck shipments and for two shippers for rail shipments. Congestion during the peak of the season was reported by one shipper who shipped cotton by both truck and rail.

Two shippers, who shipped cotton from the Southwest, had problems with congestion during peak movements for both truck and rail shipments.

One experienced difficulty due to shortages of trucks and rail cars.

Shortages of transportation vehicles in the West were a problem for one shipper for truck shipments and for two shippers for rail shipments. Warehousemen's preference to receive new cotton above shipping cotton out and congestion during the peak of the season were reported as problems for both truck and rail shipments. Other problem areas mentioned for truck shipments were extra charges for loading at some warehouses and the use of several types of bagging.

Recommendations for assembly problems. The shippers were asked in the interview what could be done to eliminate or reduce the problems they encountered in assembling cotton for shipment. Four shippers did not give any recommendations to deal with the problems they identified. The problem of congestion during the peak of the season was the problem most discussed by the shippers. Four shippers said the warehouses needed to be more efficient in time allocation. Other recommendations to this problem included (1) storing seed cotton in modules and ginning over a longer period to provide more even distribution, (2) shippers owning their own warehouse to avoid poor service, and (3) not buying cotton from producers who store cotton in warehouses which delayed shipments.

To expedite export shipments, containers as the mode of transportation and a mini-land bridge facility at Lubbock, Texas, were recommended. Having information on mills that would not unload on weekends was also recommended as a means to improve efficiency of domestic shipments.

The shippers were asked also what could be done to reduce assembly costs. Five shippers had no recommendations to reduce costs. Five other

shippers said the cotton needed to be moved more quickly to reduce their interest and storage costs. Other solutions given to reduce costs were (1) handling a larger volume, (2) owning a warehouse, and (3) increasing the amount of cotton shipped direct from gins to mills.

Recommendations for transportation problems. Fully separating transportation problems from assembly problems was difficult because they were so closely interrelated. Inability to obtain rail cars or trucks could cause assembly to be slowed down as well as delaying shipment of cotton already assembled. Three shippers reported no transportation problems. Nine had experienced shortages of rail cars and trucks. One shipper indicated that truckers needed to be more prompt and reliable. Another shipper said a late harvest in 1975-76 caused him to miss shipping dates for cotton sold for export. Nine of the shippers did not foresee any way to reduce the cost of transportation. They saw a future of rising transportation costs resulting from increases in energy costs. Some ways that were mentioned by shippers to reduce transportation costs were (1) containerization and piggybacking, (2) the use of larger rail cars, and (3) stabilizing railroad and Interstate Commerce Commission regulations.

Cotton Purchased at Gins

Volume and destination data. Six shippers purchased a total volume of 225,500 bales of cotton located at gins (Table 14). The major portion of this cotton, 175,500 bales, was purchased in the Southcentral region. Only 10,000 bales and 40,000 bales were shipped from gins in the

Table 14. Destination and Quantity of Cotton Purchased by 15 Tennessee Shippers at Gins by Region[a] and Mode of Transportation, 1975-76 Cotton Marketing Season

Destination	Quantity of Cotton							
	Shipped By Truck From Southeast[b]	Shipped By Truck From Southcentral	Shipped By Rail From Southcentral	Shipped By Truck From West[c]	Total Shipped By Truck	Total Shipped By Rail	Total Shipped	Share of Total Shipped
	Bales							Percent
Domestic Mills								
200 Mills[d]	--	21,962	13,375	--	21,962	13,375	35,337	15.7
201 Mills[d]	10,000	53,067	30,000	--	63,067	30,000	93,067	41.3
Alabama-Georgia	--	42,471	7,125	--	42,471	7,125	49,596	22.0
Mississippi	--	1,250	--	--	1,250	--	1,250	.6
Total Mill Shipments	10,000	118,750	50,500	--	128,750	50,500	179,250	79.5
Ports for Export								
Texas Gulf Ports	--	--	--	40,000	40,000	--	40,000	17.7
Louisiana, Mississippi, Alabama Ports	--	6,250	--	--	6,250	--	6,250	2.8
Total Port Shipments	--	6,250	--	40,000	46,250	--	46,250	20.5
Total Shipments	10,000	125,000	50,500	40,000	175,000	50,500	225,500	100.0

[a]States in Regions: Southeast--Alabama, Georgia, North Carolina, South Carolina, Virginia; Southcentral--Arkansas, Louisiana, Mississippi, Missouri, Tennessee; Southwest--Oklahoma, Texas; West--Arizona, California, New Mexico.

[b]No cotton was shipped by rail from the Southeast.

[c]No cotton was shipped by rail from the West.

[d]Group 200 mills represent the primary mill locations in the western half of North and South Carolina. Group 201 mills represent the primary mill locations in the western half of North and South Carolina.

Southeast and West, respectively. Cotton was not purchased at gins in the Southwest by any of the shippers in this study.

For the total volume purchased at gins, Group 201 textile mills were the primary destination, being shipped over 41 percent of the total volume (Table 14). Alabama-Georgia mills were shipped 22 percent of the cotton purchased at gins, while Group 200 mills were shipped almost 16 percent and Texas Gulf ports approximately 18 percent.

All 10,000 bales of cotton that were purchased at Southeast gins were shipped to Group 201 mills (Table 14). Texas Gulf ports were shipped all 40,000 bales purchased at gins in the West.

For the cotton purchased at gins in the Southcentral region, Group 201 textile mills were the leading destination. These mills were shipped 53,067 bales by truck and 30,000 bales by rail (Table 14). Alabama-Georgia mills were second, being shipped 42,471 bales by truck and 7,125 bales by rail. Group 200 mills were shipped 21,962 bales by truck and 13,375 bales by rail.

All cotton shipped from gins in the Southeast and West was shipped by truck. Slightly over 71 percent of the cotton from Southcentral gins were shipped by truck. Of the total volume shipped from gins, almost 78 percent were shipped by truck.

Procedures and costs of assembly and shipment. All six shippers who purchased cotton at gins shipped the cotton in full load lots. Most often this cotton was forward-contracted by the shipper with producers. Ginners held the cotton until they assembled a truck load. Then, either the shipper or ginner arranged for transportation. The gin handled all

invoices, tag lists, and bills of lading and drew a bank draft on the shipper to pay for the cotton. The cotton was loaded by the gin crew and shipped to locations designated by the shipper. Then the shipper would draw a bank draft for the cotton based on delivered mill weights.

Shippers preferred gin-direct shipments from the standpoint of cost. Total costs of assembly and shipment ranged from $12.00 to $15.25 per bale for cotton shipped from Southcentral gins. The cost for cotton shipped from Western gins ranged from $20.00 to $25.00 per bale. For Southcentral cotton, there could be a cost savings of $6.00 to $12.00 per bale. This savings would be the result of shipping flat bales (eliminating compression charges) and eliminating warehouse storage and break-out charges.

Problems of assembly. Three shippers who purchased cotton at gins did not report any problems in assembly. Two others had problems with truck and rail car shortages. One shipper had a problem with compression delays. Some gin-direct cotton could not be delivered since the actual quality produced to fulfill the contract did not satisfy millers' quality requirements. This cotton had to be warehoused at additional cost to the shippers. Fewer problems were reported for gin-direct cotton, since the volume of gin-direct cotton handled by the shippers was only a very small portion of the total volume of cotton that the shippers handled. More cotton was not shipped directly from gins because of many textile millers' reluctance to buy and receive flat bales.

Recommendations for assembly problems. One solution given to general problems in assembly was to act quickly when a problem occurred

and establish who was responsible before the problem could become more serious. Also, putting pressure on top management to improve communication and eliminate unfavorable situations was recommended. Another recommendation was to attack problems from the standpoint of lack of labor and space. One shipper felt gin-direct shipments needed (1) universal density presses at gins, (2) more storage space at gins, (3) adequate loading space at gins, and (4) dependable truck drivers. The only recommendation for reducing shipper assembly costs was to stop delays and move cotton faster to reduce their interest expense. One shipper felt that interest was the only variable cost that could be reduced for his benefit.

Transportation problems. Three shippers that purchased cotton at gins reported no transportation problems. The problems that were reported by the other three were (1) fire hazards with "hot box bales," (2) delays in obtaining rail cars, and (3) shortages of trucks during the peak season.[17]

These three shippers did not suggest any way to reduce transportation costs in light of the present energy situation. Suggestions given by the other three were employing more reliable and responsible transportation brokers and reducing freight rates.

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[17]"Hot box bales" are bales bagged with undetected patches of smoldering lint contained within the bale. The lint may have been ignited during the ginning process and may smolder within the bale for some time before either extinguishing itself or becoming a fire on the surface of the bale.

III. TEXTILE MILLS

Volume and Region of Purchase

During the 1976-77 cotton marketing year, the four textile mills studied in Tennessee purchased 101,100 bales of raw cotton (Table 15). Truck shipments accounted for 88,530 bales with 9,970 bales shipped by rail. The mills received 70,300 flat bales and 30,800 compressed bales.

The mill buyers did not buy any flat bales from the West. Two mill buyers bought only Southcentral cotton, while one bought only from the West, and one bought from the West and Southcentral. One mill buyer bought cotton entirely from within Tennessee.

Three mill buyers purchased 81,000 bales from the Southcentral region in 1976-77. A major portion of this amount, 76,600 bales, was shipped by truck. Only 1,800 bales were shipped by rail. All of the cotton received in flat bales, 70,300, was from the Southcentral region. Only 10,700 compressed bales were received from the Southcentral region.

Two mill buyers bought cotton from within Tennessee. These amounts were included in the Southcentral totals. Tennessee cotton supplied 73,600 bales to the two mills. Some of this cotton was shipped directly from gins. Truck shipments accounted for 69,740 bales and rail shipments for 1,260. This large portion being shipped by truck was due partially to all gin-direct cotton being shipped by truck. The millers received 64,150 flat bales and 9,450 compressed bales from Tennessee. Direct shipments from gins also account partially for the large number of flat bales received by the millers.

Two millers received cotton from the West, primarily California. All of the 20,100 bales purchased from the West in 1976-77 were

Table 15. Quantity of Cotton Purchased by Region, Mode of Transportation, and Compression of Bale for Cotton Purchased by Four Tennessee Textile Mills, 1975-76 and 1976-77 Cotton Marketing Seasons

Region of Purchase[a]	Year	Mills	Quantity of Cotton				
			Total Purchased	Received By Truck[b]	Received By Rail	Received Compressed	Received Flat
			Bales				
Southcentral	1975-76	3	115,200	110,000	2,200	15,100	100,100
	1976-77	3	81,000	76,600	1,800	10,700	70,300
West	1975-76	2	15,800	11,240	4,560	15,800	0
	1976-77	2	20,100	11,930	8,170	20,100	0
Tennessee[c]	1975-76	2	105,000	100,200	1,800	13,500	91,500
	1976-77	2	73,600	69,740	1,260	9,450	64,150
All Regions	1975-76	4	131,000	121,240	6,760	30,900	100,100
	1976-77	4	101,100	88,530	9,970	30,800	70,300

[a]States in Regions: Southcentral--Arkansas, Louisiana, Mississippi, Missouri, Tennessee; West--Arizona, California, New Mexico.

[b]3,000 bales in 1975-76 and 2,600 in 1976-77 moved directly from gin to mill by handtruck (mill adjacent to gin).

[c]Tennessee totals are included in totals for the Southcentral Region.

compressed. They received 11,930 bales by truck and 8,170 bales by rail.

California cotton was preferred by two of the buyers for its higher quality. Much of the cotton grown in California was irrigated making its fibers more consistent than nonirrigated cotton. This consistency and greater fiber strength makes the processing run more smoothly according to these buyers. California cotton also had a greater fiber strength.

Tennessee cotton was preferred by two mill buyers. They stated that their mills were built in the Tennessee cotton production area in order to utilize cotton from the area. These millers produced textile products that could be made with the quality of cotton grown in Tennessee.

More cotton was purchased by the Tennessee textile millers during the 1975-76 season than in 1976-77. During 1975-76, Tennessee millers bought 131,000 bales of raw cotton, while in 1976-77, they bought 101,100 bales.

Receiving, Storage, and Transportation

None of the millers reported any cost differentials in receiving cotton due to mode of transportation. Two millers received only truck shipments. The other two received shipments by both truck and rail but indicated no difference in cost.

Concerning receiving and storing flat bales, the mill buyers indicated that any additional cost would only arise from reduced storage capacity. One miller did not receive any flat bales and another received only about 2 percent flat. One buyer said that flat bales were harder to handle during processing than compressed bales. Two millers received

primarily flat bales. These millers bought a large percentage of gin-direct cotton. These buyers seemed to think the advantages of buying directly from the gin were greater than the disadvantages of handling flat bales. Most of the flat cotton was hauled short distances, and each mill had adequate storage space.

Each buyer indicated very few difficulties in receiving cotton at the specified time. One mill manufactured products only on contract, so the buyer knew in advance how much cotton he would need and at what time it would be needed. He ordered cotton far enough in advance so that unforeseen delays would not be as critical. Another miller tried to buy his full year's supply of cotton during the major harvesting time of the crop. This mill had a large storage facility and bought direct shipments from gins. The only problem mentioned concerning receiving cotton on time was the slowness of the railroads. One buyer said that when he needed cotton quickly, he ordered it shipped by truck. Truck shipments from California were delivered in 3 days, while rail shipments took 10 days to 2 weeks. None of the buyers reported any adverse effects on cotton quality due to mode of transportation.

Forward Contracting

Two of the four millers in the survey forward contracted cotton with producers and ginners. One of them had contracted as much as 2/3s of his purchases, while the other contracted only small amounts. Another miller forward contracted with a cotton cooperative.

All buyers, who had contracted cotton, reported that their purchasing practices were not affected by contracting. They purchased in

the same areas and from the same types of sellers. Delivery methods, timing of deliveries, and storage practices were all the same regardless of how the cotton was purchased.

The buyers commented on the advantages and disadvantages of forward contracting from the millers' viewpoint. The biggest advantage reported was to have more assurance of an adequate supply of cotton to meet mill needs. Another advantage was to buy cotton during a low price period. One buyer said the producer received more advantages from contracting than the mill.

The only reported disadvantage of forward contracting was having to hedge the contracts on the futures market. Contracts with producers were based on the number of acres, while futures contracts were based on the number of bales. Thus, when producer yields were low, the miller had to buy unfilled contracts and risk a loss due to increased prices. The miller could also have an advantage when yields were higher than expected.

Purchasing Practices

All four mill buyers indicated that bale coverings on the cotton they purchased adequately protected the quality of the cotton. Three buyers reported no preference as to the type of bale covering. One buyer preferred the jute bagging since jute had some resale value and plastic presented a disposal problem.

None of the buyers expressed a willingness to purchase modular handled cotton on the basis of one sample for the ten bale lot. Each buyer wanted a sample for each bale so that processors could know exactly

what quality of cotton was being processed. One buyer felt that the cotton industry might use this system in the future.

The buyers bought a variety of grade and staple length combinations. The grades purchased by the millers included middling, strict low middling, strict low middling light spotted, strict low middling spotted, and strict low middling leaf. Staple lengths included 1-1/32, 1-1/16, and 1-3/32 inches. Micronaire averaged between 4 and 4.5 for each mill and had a mike range of 3.5 to 5.0.[18] The millers sometimes purchased cotton that was not premium micronaire and mixed it with premium micronaire cotton in processing. One miller that produced cotton carded yarns desired a 90,000 pound per square inch break strength. Break strength could be specified on California irrigated cotton but not on nonirrigated cotton due to inconsistency of the fibers. One buyer said the introduction of the fibrograph test had helped tremendously in determining correct staple length of cotton. He said this was much better than the subjective opinions of different cotton classers.

Fiber Quality Requirements

Two mill buyers reported that the importance of fiber properties in their purchases had remained about the same in recent years. No large difference was noticeable. One buyer reported that fiber property requirements were becoming slightly less stringent, while the other buyer indicated an increase in stringency. This increase in stringency was to

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[18] Micronaire test is a measure of maturity and fineness. Instruments give readings in micrograms per inch of fiber. The larger the micronaire value, the coarser the fiber.

allow cotton to run through spinning equipment better.

The buyers commented on the effect of the use of crusher rolls on cards at the mill on the quality of cotton used at their mill. Three buyers reported no effect on the quality of cotton purchased. They also said crusher rolls were beneficial in removing trash from the fiber. One buyer said using crusher rolls actually improved the quality of the cotton. One buyer indicated that he could buy a slightly lower quality of cotton and at the same time produce a higher quality product since the crusher rolls removed a greater amount of foreign matter.

Blending cotton with man-made fibers could affect the quality of cotton purchased by mills. One miller in the survey used 100 percent cotton in its operation. The other three blended cotton with synthetic fibers. Two buyers said blending did not affect the quality of cotton they needed. One buyer said a lower quality cotton could be used at his mill when blended with synthetics.

IV. COMPARISON OF DATA FROM DIFFERENT FIRM GROUPS

Comparisons of volume information from the different firm groups revealed minor discrepancies in the survey data. A comparison of reported shipper volumes and reported volumes received by mills in 1975-76 showed that all figures for the Southcentral region were within reasonable bounds (Table 16). However, shippers reported shipping 326 bales by rail from the Southeast region to Tennessee mills, while Tennessee millers did not report receiving cotton from the Southeast. Also, shippers reported 1,910 bales shipped by rail from the Southwest region to Tennessee. No cotton was reported received from the Southwest

Table 16. Comparison[a] of Reported Shipments by 15 Tennessee Cotton Shippers with Receipts of Four Tennessee Mills by Region[b] and Mode of Transportation, 1975-76 Cotton Marketing Season

Region	Total Shippers Shipments	Total Mill Receipts	Shipper Shipments By Truck	Mill Receipts By Truck	Shipper Shipments By Rail	Mill Receipts By Rail
	Bales					
Southeast	326	0	0	0	326	0
Southcentral	17,400	115,200	16,500	110,000	900	2,220
Southwest	1,910	0	0	0	1,910	0
West	5,327	15,800	0	11,240	5,327	4,560
Total	24,963	131,000	16,500	121,240	8,463	6,760

[a]Volumes that do not compare correctly are underlined.

[b]States in regions: Southeast--Alabama, Georgia, North Carolina, South Carolina, Virginia; Southcentral--Arkansas, Louisiana, Mississippi, Missouri, Tennessee; Southwest--Oklahoma, Texas; West--Arizona, California, New Mexico.

by the millers. Millers reported receiving 4,560 bales by rail from the West region, while shippers reported 5,326 bales shipped by rail from the West to Tennessee mills. This also made the total number of bales shipped by rail more than the total number of bales received by rail.

The survey information from this study was combined with published USDA information to develop a flow chart depicting the movement of bale cotton from Tennessee gins, gin-warehouses, and other warehouses to various destinations (Figure 3). The flow chart emphasizes the magnitude of direct shipments of cotton from the gins to mills and provides an additional check on the accuracy of the survey data.

Direct shipments of cotton to Tennessee mills as reported by Tennessee ginners and gin-warehousemen for the 1975-76 season were within the bounds of the shipments reported by the Tennessee mills. According to the USDA statistics, the Tennessee mills received 27,442 bales from warehouses [7]. Based on the survey of Tennessee gins, an additional 9,000 bales were shipped directly to Tennessee mills from gin-warehouses, and 42,717 bales were shipped directly from gins. Thus, the Tennessee mills received 79,159 bales during the 1975-76 season, according to USDA statistics regarding warehouse shipments and the survey data from this study regarding gin shipments. However, based on the survey of Tennessee millers, these mills received 105,000 bales during the 1975-76 season.[19]

The other direct shipments of cotton from Tennessee gins went to mills in the Carolinas and Georgia. A small volume was shipped from

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[19]This discrepancy could be due to the fact that the mill buyers answered the survey question on a percentage share basis and did not "calculate" the volume from recorded information.

Figure 3. Movement of cotton through gins and gin-warehouses to domestic mills and export outlets in bales, 1975-76 season.

[a]Source: Tables 2, 3, and 6 (pages 18, 20, and 29).

[b]Source: Domestic Shipments of U.S. Cotton, 1975-76 Season [7].

[c]Derived by subtracting volume reported by the surveyed gins and gin-warehouses (97,863) from total volume ginned in Tennessee (222,000) during 1975-76 season [13].

[d]Derived by subtracting the results from footnote c above (124,137) and the reported volume shipped to warehouses by the surveyed gins (29,756) from the total domestic shipments from Tennessee warehouses (454,670) by U.S.D.A. [7].

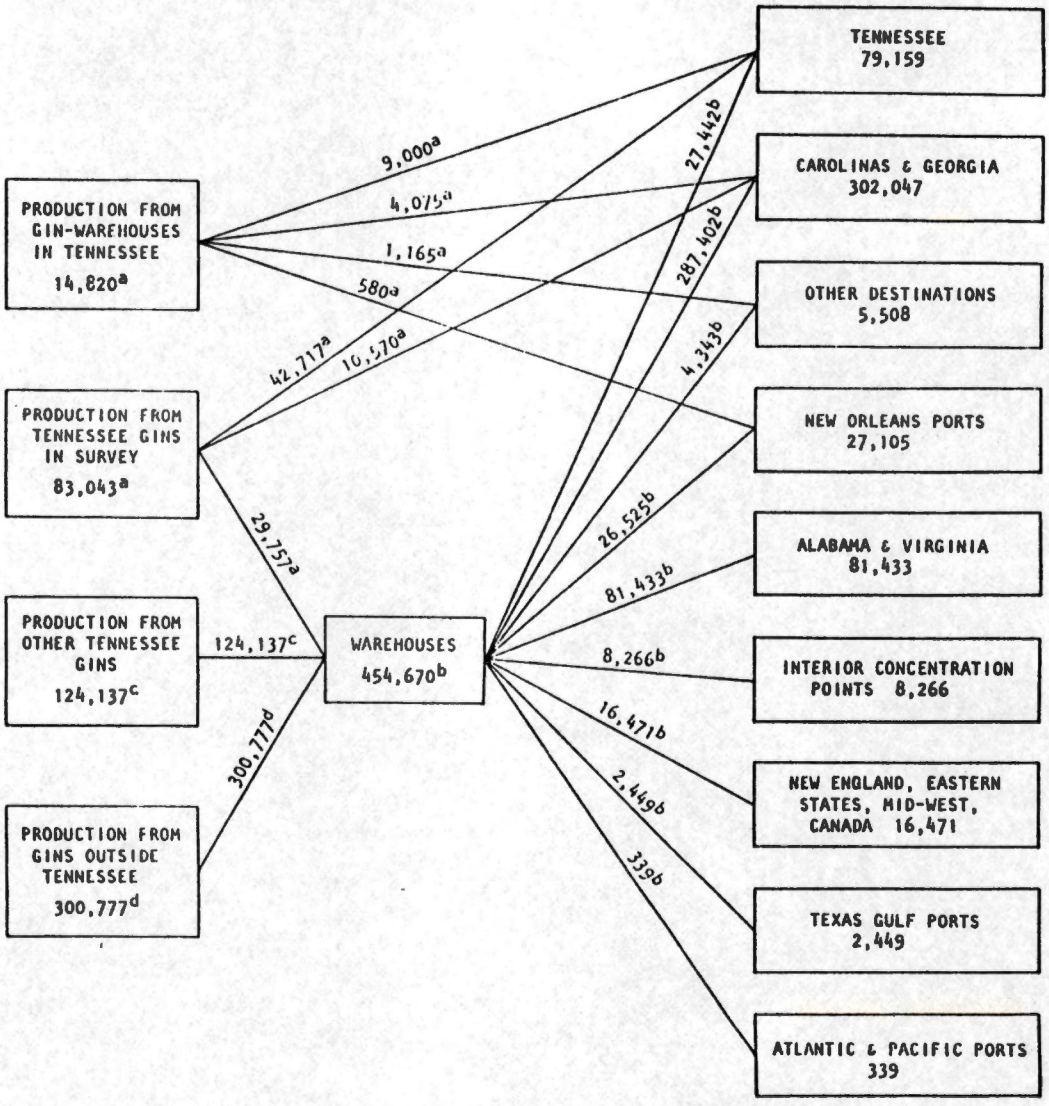

PRODUCTION FROM GIN-WAREHOUSES IN TENNESSEE
14,820a
PRODUCTION FROM TENNESSEE GINS IN SURVEY
83,043a
PRODUCTION FROM OTHER TENNESSEE GINS
124,137c
PRODUCTION FROM GINS OUTSIDE TENNESSEE
300,777d
WAREHOUSES
454,670b
9,000a
4,075a
1,165a
580a
42,717a
10,570a
29,757a
124,137c
300,777d
TENNESSEE
79,159
CAROLINAS & GEORGIA
302,047
OTHER DESTINATIONS
5,508
NEW ORLEANS PORTS
27,105
ALABAMA & VIRGINIA
81,433
INTERIOR CONCENTRATION POINTS 8,266
NEW ENGLAND, EASTERN STATES, MID-WEST, CANADA 16,471
TEXAS GULF PORTS
2,449
ATLANTIC & PACIFIC PORTS
339
27,442b
287,402b
4,343b
26,525b
81,433b
8,266b
16,471b
2,449b
339b

Figure 3

gin-warehouses to New Orleans' ports and other minor destinations.

The largest share (63 percent) of cotton shipped from Tennessee warehouses went to mills in the Carolinas and Georgia. The next largest share (18 percent) was shipped to Alabama and Virginia mills.

CHAPTER IV

SUMMARY

Cotton was the fourth leading crop in the United States in 1976 providing $3.8 billion in farmer revenue. Twenty-seven Tennessee counties produced cotton in 1976. Production of 228,000 bales provided cotton lint valued at $69,385,000 and cottonseed valued at $9,464,000.

The movement of cotton from scattered assembly points to export outlets and consuming mills had been a problem area for many years. Thus, the overall objective was formed: To determine the methods, problems, and costs associated with assembling cotton for shipment directly from gins and gin-warehouses to domestic mills and export outlets. Personal interviews were conducted with each of 34 ginners, 3 gin-warehousemen, 4 textile millers, and 15 cotton shippers to obtain data for the study.

Gins

The average age of the firm was 23 years, while the average age of the facility was 16 years. Fourteen gins were partnerships, 13 were corporations, and 7 were owned by individuals. Thirty-three of 34 ginners shipped all cotton by truck. Nineteen ginners reported that cotton for direct shipment was all contracted, 11 reported partially contracted, and 4 reported no contracting. Almost 65 percent of the ginners reported cotton ordered shipped by mills.

Eighteen of 34 gins surveyed made direct shipments in 1973, 21 in 1974, 28 in 1975, and all 34 in 1976. Ginning volumes declined from 1973 to 1976, while the percentage of total volume and the number of

bales shipped directly increased in each year of the study.

Most of the cotton for direct shipment was purchased by Tennessee textile mills. In 1976, 36,691 out of 57,845 bales were shipped to Tennessee mills. Other destinations of cotton shipped from gins were the Carolinas and Georgia.

Only two of 29 ginners responding to this question reported any differences in handling procedures for direct shipments to mills. Three procedures used in handling cotton were (1) moving cotton directly into the truck or rail car, (2) moving cotton directly to storage, and (3) storing cotton temporarily on the loading platform. Hand trucks, fork-lifts, and electric hoists were used by one-, two-, or three-man crews in handling the cotton.

Cost data included only additional costs resulting from direct shipments. Trucking was the major additional variable cost at 34.8 cents per bale. Other increased variable costs were insurance, storage labor, and break-out labor.

Twenty ginners reported a problem with labor availability. Only one reported delays in shipping due to inability to fill a lot as ordered. There was no problem in obtaining equipment. Five ginners reported problems with equipment repairs. Eight ginners reported delays in shipping due to lack of means of transportation.

Thirty-three gins had modified flat gin presses. One gin had a standard density press and received a $1.00 compression fee from buyers.

Gin-Warehouses

The average age of the gin-warehouse firms was 49 years, while the average age of the gins was 4.3 years. All three were owned by

corporations. Two facilities were located adjacent to textile mills. Part of the cotton at each facility was contracted.

The average ginning volume for the gin-warehouses declined to 4,407 bales in 1976. Total volume was 13,220 bales of which 7,200 bales were utilized by Tennessee mills. Carolina and Georgia textile mills and New Orleans' ports were other destinations for cotton from gin-warehouses.

Two gin-warehousemen reported labor availability problems. One had a problem with transportation. No other problem was reported.

Two gin-warehouses had standard density presses. The other had a flat gin press. One firm received a $3.75 per bale charge from buyers for compressing to standard density.

Cotton Purchased at Local Market Warehouses by Shippers

Fourteen cotton shippers purchased 4,212,167 bales at local market warehouses. For all regions combined, Group 201 mills were the leading destination for cotton handled by these shippers. Alabama-Georgia textile mills were the leading destination for cotton shipped from the Southeast, Group 201 mills for the Southcentral, Texas Gulf ports for the Southwest, and California ports for the West. Only the Southwest shipped more cotton by rail than by truck. For all cotton, 56 percent were shipped by truck and 44 percent shipped by rail. Costs of assembly and shipment ranged from $13.75 to $16.00 in the Southeast; $18.75 to $23.75 in the Southcentral region; $21.25 to $25.00 in the Southwest; and $22.50 to $30.00 in the West. Nine shippers assembled cotton in less than full load lots. Additional costs of $0.50 to $0.75 per bale were sometimes

encountered due to trucks loading at more than one location.

The most prevalent problem of assembly was congestion at warehouses during the peak season. Shortages of trucks and rail cars were the most important transportation problems.

Cotton Purchased at Gins by Shippers

Six shippers purchased 225,500 bales of cotton located at gins. Group 201 textile mills were the primary destination of the cotton shipped from gins. Almost 78 percent of the cotton were shipped by truck.

Costs of assembly and shipment ranged from $12.00 to $15.25 in the Southcentral region, and $20.00 to $25.00 per bale in the West. Assembly and shipment costs in the Southcentral region could be reduced $6.00 to $12.00 per bale by eliminating compression and warehouse charges.

Delays and congestion during the peak season were the major problems of assembly at gins. Transportation problems for direct shipments were (1) fire hazards, (2) delays in obtaining rail cars, and (3) shortages of trucks.

Textile Mills

Tennessee textile mill buyers purchased 101,100 bales in 1976-77 after purchasing 131,000 bales in 1975-76. The major portion of this cotton, 73,600 bales in 1976-77 and 105,000 in 1975-76, was purchased from Tennessee. Two millers preferred Tennessee cotton due to location of the mills in the Tennessee cotton-producing region.

There were no cost differentials in receiving cotton due to mode of transportation. The only additional cost of receiving and storing

flat bales occurred from reduced storage capacity. The only problem with receiving deliveries on time was the slowness of the railroads.

Two of the four mill buyers forward contracted cotton with producers and ginners. Grades of cotton purchased were middling, strict low middling, strict low middling light spotted, strict low middling spotted, and strict low middling leaf. Staple lengths purchased were 1-1/32, 1-1/16, and 1-3/32 inches.

Two mill buyers reported the importance of fiber properties in purchasing had remained about the same; one reported a decrease in importance, and one an increase. Three millers blended cotton with synthetic fibers, but only one used a lower quality cotton when blending.

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