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To the Graduate Council:

I am submitting herewith a thesis written by Carl Edward Madewell entitled "Determining the Variation of Foreign Matter in Seed Cotton Ginned at Two Gins in Tennessee." I recommend that it be accepted for nine quarter hours of credit in partial fulfillment of the requirements for the degree of Master of Science, with a major in Agricultural Economics.

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DETERMINING THE VARIATION OF FOREIGN MATTER IN SEED COTTON
GINNED AT TWO GINS IN TENNESSEE

A Thesis
Presented to
the Graduate Council of
The University of Tennessee

In Partial Fulfillment
of the Requirements for the Degree
Master of Science

by
Carl Edward Madewell
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CHAPTER I

INTRODUCTION

I. SITUATION AND IMPORTANCE OF STUDY

Cotton was Tennessee's leading cash crop in 1958 with a total value of 82 million dollars.¹ It has ranked first in value of production since 1951.² Farm income from cotton lint and cottonseed averaged \$80,739,000 annually from 1954 through 1958.³ In 1958 the crop was grown on 30 per cent or 62,234 of the 207,440 farms in Tennessee.⁴ Cotton is grown in more than 50 of the 95 counties in the state and is an important cash crop in 34 of these counties.⁵

Since so many farmers, merchants, cotton-mill workers, ginner, and others in Tennessee are dependent upon cotton for a living, it is important that any factor be considered that will improve or make the cotton industry more efficient to those that it serves.

¹S. T. Marsh, G. D. Collins, and Sam Guy, Cash Receipts From Farming, Tennessee, Release No. 1973 (Nashville: Tennessee Department of Agriculture, September 25, 1959).

²Tennessee Department of Agriculture, Agricultural Trends in Tennessee (third edition; Nashville: Agricultural Marketing Service, November, 1958), p. 16.

³Marsh, loc. cit.

⁴Tennessee ASC Committee, Tennessee Annual Statistical Report ASC Programs, 1958, U. S. Department of Agriculture (Washington: Government Printing Office, September, 1959), pp. 2-3, 47-48.

⁵Tennessee Department of Agriculture, Agricultural Trends in Tennessee, loc. cit.

A survey of the cotton-ginning industry in Tennessee in 1959 revealed that only 4 per cent or 11 gins had seed scales in operation.⁶ From 92 to 94 per cent of the cottonseed produced in Tennessee is sold to the ginner at the time of ginning. Over 94 per cent of the gimmers use a dockage system for estimating the amount of foreign matter in hand-picked cotton, and over 60 per cent use a dockage system for estimating foreign matter in hand-snapped cotton.⁷ Therefore, if this dockage for foreign matter is too high, the ginner profits; if it is too low, the farmer profits. The reason for this is that the seed cotton minus the net lint weight minus the dockage for foreign matter equals the amount of cottonseed. Where the gimmers' dockage for foreign matter is less than the actual amount of foreign matter in the seed cotton, the producer will receive pay for more cottonseed than he actually had, and the ginner will lose by this amount, assuming that the ginner uses this method of figuring weight of cottonseed in the seed cotton and he does not make up for it in the price charged for ginning or in some other way.

In the days of plantation ginning when clean, hand-picked cotton came to the gin, the ginner generally did not dock for foreign matter because there was such a small amount actually in the seed cotton.⁸ In other words, the net weight of the seed cotton minus the lint equaled

⁶B. D. Raskopf, Cotton Ginning Industry in Tennessee, Bulletin No. 303 (Knoxville: Tennessee Agricultural Experiment Station, 1959), pp. 35-37.

⁷Ibid., p. 61.

⁸V. R. Cardozier, Growing Cotton (New York: McGraw-Hill Book Company, Inc., 1957), p. 392.

the amount of cottonseed. In recent years the situation has changed considerably because of the use of different methods of harvesting, such as machine picking and hand snapping, which make the no-dockage system impractical to the ginner. Some ginner who have installed seed scales so that the producer will be compensated for the actual amount of cottonseed that is in his cotton have reported that producers are dissatisfied when the total weight of the seed and lint does not equal the weight of their seed cotton. As a result, in order to satisfy customers and meet competition of other ginner who do not dock for foreign matter, some ginner have been forced to include as seed weight the loss in foreign matter. The ginner cannot afford to do this, so he must either reduce the price paid per ton for seed or make up for it some other way.⁹ A survey of the cotton-ginning industry in Tennessee in 1958 revealed that the dockage system for foreign matter in seed cotton varied greatly among ginner. For example, the foreign-matter dockage in hand-picked and machine-picked cotton varied from 2 to 11 per cent and averaged around 7 per cent for 280 ginner using dockage systems. The foreign matter dockage for hand-snapped cotton varied from 5 to 40 per cent. Data are not available as to the actual amount of foreign matter in individual lots of seed cotton at these gins. Therefore, research is needed to determine the actual amount of foreign matter in seed cotton in individual bale lots, by specified periods throughout several seasons, and at different locations.

⁹Ibid.

II. DEFINITIONS OF TERMS

1. Seed cotton--Cotton before it is ginned.
2. Total cotton--A term applied to picked cotton and snapped cotton when used collectively.
3. Hand-picked cotton--Seed cotton which is picked carefully from every boll and is as free as possible from foreign matter.
4. Hand-snapped cotton--Cotton which is harvested by pulling off the entire opened boll from the plant (burrs, seed cotton, and all).
5. Machine-picked cotton--Cotton which has been picked from the bolls by a machine, leaving most of the empty burrs on the plant. This is done by means of spindles or fingers on the machine, without much injury to the leaves or unopened bolls.
6. Turnout--The amount of lint cotton remaining after seed and foreign matter have been removed in the ginning process.
7. Seed scales--A machine used for weighing cottonseed.
8. Foreign matter--Anything remaining after the cottonseed and lint were removed from the seed cotton. It included burrs, leaves, stems, limbs, dirt, small particles of trash, dust, notes, moisture, and anything else that had weight. (For this study foreign matter was determined by adding the weight of lint plus the weight of cottonseed and subtracting this from the weight of seed cotton.)

III. STATEMENT OF THE PROBLEM

Since there is this great variation in dockage for foreign matter, and there is very little, if any, accurate data available on the extent

of variation of foreign matter in seed cotton, both the ginner and the farmer probably stand to lose. With this situation in mind, the problem may be stated as determining the variation in dockage methods being used by Tennessee ginner and the actual variation that exists in foreign matter in seed cotton at selected gins in the state.

IV. OBJECTIVES OF THE STUDY

The objectives of the study may be stated as follows:

1. To determine the variation of foreign matter in seed cotton at selected gins in Tennessee.
2. To determine if the methods commonly used by ginner in Tennessee for estimating the weight of cottonseed or the amount of foreign matter in seed cotton gives either the ginner or his customers any assurance of accuracy.
3. To study some of the factors believed to be associated with the amount of foreign matter in seed cotton.
4. To offer suggestions for improvement in determining the amount of foreign matter in seed cotton.

V. HYPOTHESES

The hypotheses may be stated as follows:

1. Few of the methods commonly used by ginner for estimating the weight of cottonseed or the amount of foreign matter in seed cotton give either the ginner or his customer any assurance of accuracy.
2. The foreign matter in seed cotton (total, picked, or snapped) varies

greatly from bale to bale.

3. The foreign matter in seed cotton (total, picked, or snapped) varies considerably from beginning to end of the ginning season.
4. The foreign matter in seed cotton (total, picked, or snapped) varies considerably from season to season.
5. The foreign matter in seed cotton varies greatly from picked to snapped cotton.
6. The foreign matter in seed cotton (total, picked, or snapped) varies erratically from gin to gin in different geographical areas.
7. A high percentage of the variability in foreign matter in cotton is associated with the variability in number of rainy days during the harvesting season.
8. The amount and proportion of foreign matter in seed cotton varies erratically from community to community in a gin area.

It is believed that the solution to this problem will reveal information that can be used both by the ginner and the farmer in future years. The study may reveal problems that will require further research.

VI. REVIEW OF RELATED LITERATURE

Very little work has been done on this subject in Tennessee or in the United States. A study was made in 1916 by the United States Department of Agriculture on "Disadvantages of Selling Cotton in the Seed." Those who made the study took 881 samples of eight pounds of seed cotton each in nine towns in Oklahoma and ginned these on a small ten-saw gin

and calculated the per cent of lint, seed, and trash. They found a wide variation in per cent of trash, but concluded that they did not have enough samples to determine the true range of variation. In their samples they did find that as the grade improved, the proportion of lint and seed increased and the proportion of foreign matter decreased.¹⁰

A study was made by the Texas Agricultural Experiment Station during 1943, 1944, and 1945 by using four different methods of harvesting on four varieties of cotton grown at two locations, College Station and Lubbock. The different varieties used were Hibred, Macha, Deltapine, and Rogers Acala; the methods of harvesting were hand-picked, hand-snapped, machine-picked, and machine-snapped. This study showed that the percentage of foreign matter in hand-snapped and machine-snapped cotton did not show any significant differences. There was an apparent significant difference, however, in the percentage of foreign matter when varieties were compared. Also, more foreign matter was removed from the machine-picked than from the hand-picked cotton. In the cleaning and ginning process more foreign matter was removed from short staple, hand-picked cotton than from the longer staple cottons that were harvested by hand-snapping and machine harvesting. Since the machine-picked and hand-picked samples contained no burrs, they were not run through an extractor prior to ginning as was the case with the hand-snapped and machine-

¹⁰Charles F. Creswell, Disadvantages of Selling Cotton in the Seed, U. S. Department of Agriculture, Bulletin No. 375 (Washington: Government Printing Office, August 9, 1916), pp. 4-6.

stripped cotton which did contain burrs.¹¹

In 1945 and 1946 a study was made by the Agricultural Experiment Station at the University of Tennessee on 39 gins in 21 counties. Those making the study found that 14 different formulae were used in the determination of the weight of the cottonseed. By using each of these formulae it was found that the weight of cottonseed derived from any given quantity of seed cotton would vary considerably.¹²

Another study was made by the Agricultural Experiment Station at the University of Tennessee in 1956 on a 20 per cent sample of 36,595 bales of cotton ginned at five gins in three counties in West Tennessee during the three-year period, 1951-53. They found that the ginners dockage for dirt and trash varied from 5 to 10 per cent of the gross weight of the seed cotton.¹³ The gins used in this study did not have seed scales, so the actual amount of dirt and trash in the cotton could not be determined. Indications were that further research should be done in this area.

A study was made by the Farmer Cooperative Service of the United States Department of Agriculture in 1957 on "Estimating the Weight of

¹¹H. P. Smith, Joseph T. Rouse, and D. T. Killough, Comparison of Different Methods of Harvesting Cotton, Bulletin No. 683 (College Station: Texas Agricultural Experiment Station, October, 1946), pp. 21-22.

¹²H. L. Downen and E. J. Lebrun, Marketing Cottonseed in Tennessee, Monograph No. 233 (Knoxville: Tennessee Agricultural Experiment Station, 1947), pp. 31-32.

¹³B. D. Raskopf, Factors Affecting Cotton Prices in Ginners Markets in Tennessee, Bulletin No. 251 (Knoxville: Tennessee Agricultural Experiment Station, September, 1956), pp. 4-10.

Cottonseed by Gins." Data in this study were collected from scale weights on 10,800 bales of cotton from five cooperative gins in Texas and Oklahoma. Some data were collected from cooperative gins in California.

It was found that when trash made up a substantial part of some seed cotton, the per cent of cottonseed was not an accurate base for estimating seed weights. Also, the relationship of per cent of trash and per cent of lint would probably be close enough on high-turnout, picked cotton to provide a base as good as some of the other methods for estimating weight of cottonseed. However, since accurate data on percentages of trash were lacking, this was generally an inadequate base for estimating weight. It was also indicated that the per cent of trash in seed cotton and the pounds of trash increased at both Texas and Oklahoma gins during the season.¹⁴

VII. METHOD OF PROCEDURE AND SOURCE OF DATA

The information upon which this study was based was obtained primarily from the records of two gins, the Bemis gin in Madison County and the Towry gin located in Lincoln County (Figure 1). These two gins were selected because, of the eleven that had seed scales, only these two had records that could be used in the determination of the weight of the foreign matter in the seed cotton that had been ginned over a period of several years.

¹⁴John D. Campbell, Estimating the Weight of Cottonseed by Gins, U. S. Department of Agriculture, Farmer Cooperative Service Report 29 (Washington: Government Printing Office, July, 1957), p. 4.



Counties:

1. Madison
2. Lincoln

FIGURE 1

LOCATION OF THE TWO COUNTIES WHERE THE GINS IN THE STUDY OF FOREIGN MATTER
IN COTTON ARE SITUATED, TENNESSEE, 1954-1958

At each of these gins data for five years were collected, 1954 through 1958. Before the data were collected, it was decided that at the Towry gin data would be collected on every bale for which data were available, but that at the Bemis gin a representative sample could be obtained by collecting data from each of the first 50 and the last 100 bales ginned, but only on every other bale between these, except for 1958, for which data on every bale of cotton ginned would be collected. (See Tables I and II for the proportion of cotton samples at the Towry and Bemis gins in relation to all cotton ginned at these gins, the county of gin location, in Tennessee, 1954 through 1958.)

All data available on each bale of cotton used in the sample was collected. At the Towry gin this included net weight of seed cotton (weight of seed cotton minus weight of vehicle), weight of lint, weight of cottonseed, and method of harvest. At the Bemis gin the data collected were net weight of seed cotton, weight of lint, weight of cottonseed, method of harvest, and location of the producer.

These data, along with secondary sources of information, were used to test the hypotheses as stated previously. Also, the methods used by ginners in Tennessee for assessing foreign matter in seed cotton, obtained in a survey of 127 gins of the state in 1958, were analyzed. These methods have been applied to the results obtained from Bemis and Towry gins to evaluate the first hypothesis stated, which was that the methods commonly used by ginners for estimating the weight of cottonseed or the amount of foreign matter in seed cotton give neither the ginner nor his customer any assurance of accuracy.

TABLE I

PROPORTION OF COTTON SAMPLES AT THE TOWRY GIN IN RELATION TO ALL COTTON
GINNED AT THIS GIN, THE COUNTY OF GIN LOCATION, AND THE STATE,
TENNESSEE, 1954-1958^a

Year	Towry Gin--Lincoln County	Ginning Periods				Year
		Sept.	Oct.	Nov.	Other	
		Per Cent of Cotton				
1954	That samples were of ginnings	63.4	53.8	32.0	7.1	57.9
	That Towry ginnings were of county	13.9	12.1	24.2	20.6	13.2
	That county ginnings were of state	2.2	2.2	0.5	0.2	2.0
1955	That samples were of ginnings	38.6	18.3	27.9	24.1	22.7
	That Towry ginnings were of county	10.2	16.3	18.9	27.3	15.8
	That county ginnings were of state	2.3	3.2	1.5	0.5	2.4
1956	That samples were of ginnings	39.7	33.2	21.7	11.1	31.5
	That Towry ginnings were of county	8.2	16.6	20.3	7.8	15.8
	That county ginnings were of state	0.9	3.0	6.0	3.6	2.3
1957	That samples were of ginnings	61.1	27.6	25.8	21.4	28.5
	That Towry ginnings were of county	18.5	15.1	13.7	14.0	13.6
	That county ginnings were of state	3.1	1.9	2.8	1.8	2.2
1958	That samples were of ginnings	30.0	27.8	23.0	19.8	21.8
	That Towry ginnings were of county	2.0	14.6	19.9	25.1	17.7
	That county ginnings were of state	0.3	1.5	2.0	3.2	1.5

^aSource: Appendices A, B, and C.

TABLE II

PROPORTION OF COTTON SAMPLES AT THE BEMIS GIN IN RELATION TO ALL COTTON
GINNED AT THIS GIN, THE COUNTY OF GIN LOCATION, AND THE STATE,
TENNESSEE, 1954-1958^a

Year	Bemis Gin--Madison County	Ginning Periods				Year
		Sept.	Oct.	Nov.	Other	
		Per Cent of Cotton				
1954	That samples were of ginnings	52.0	48.0	49.4	91.9	49.6
	That Bemis ginnings were of county	13.3	12.4	13.4	13.9	13.0
	That county ginnings were of state	5.0	4.9	4.8	3.7	4.9
1955	That samples were of ginnings	62.3	43.0	43.4	51.6	45.7
	That Bemis ginnings were of county	8.0	11.7	9.6	10.0	10.5
	That county ginnings were of state	4.8	5.1	5.5	6.4	5.3
1956	That samples were of ginnings	51.7	50.0	50.0	94.2	52.4
	That Bemis ginnings were of county	9.8	12.8	13.7	31.2	11.3
	That county ginnings were of state	6.4	4.5	3.0	2.8	5.2
1957	That samples were of ginnings	66.2	49.9	50.0	56.5	52.4
	That Bemis ginnings were of county	9.0	12.2	10.6	13.7	12.0
	That county ginnings were of state	7.4	5.7	6.0	6.0	5.9
1958	That samples were of ginnings	70.4	98.7	100.0	98.4	99.7
	That Bemis ginnings were of county	11.9	10.0	6.9	7.6	10.2
	That county ginnings were of state	10.5	6.6	5.5	3.8	6.4

^aSource: Appendices A, B, and C.

The gins from which we obtained data used in this study represented many conditions typical of the cotton-producing areas of the state. These conditions included varieties, soils, climate, quality of cotton grown, yield per acre, method of production and harvesting. The two gins are located in two different geographic areas of the state: the Bemis gin in West Tennessee, which produces over 92 per cent of the state's cotton, and the Towry gin in the southern part of Middle Tennessee.

The estimated percentage of cotton acreage planted to specific varieties in Lincoln and Madison counties is similar to that of the state. For the five-year period studied the majority of cotton grown in the state was Deltapine or Empire, and this was also true for Lincoln and Madison counties. In 1958 about 85 per cent of the cotton grown in the state was either Deltapine or Empire, and this was also true for Lincoln and Madison counties.¹⁵

Other varieties grown in the state and also in Lincoln and Madison counties were: Fox, Hibred, Stoneville, and Coker 100W.

Annual precipitation in Lincoln County averages 54 inches, the growing season is about 200 days, and July temperature averages 78° F. The annual precipitation in Madison County averages 49 inches, the growing season is about 200 days, and the July temperature averages 79° F. The first killing frost in the fall is usually around October 26, which

¹⁵U. S. Department of Agriculture, Cotton Varieties Planted, 1954-1958 (Memphis: Agricultural Marketing Service, Cotton Division, 1954-1958), pp. 14-15.

is typical of the entire cotton-producing area of Tennessee.¹⁶ The Memphis, Grenada, and similar or associated soils are characteristic of West Tennessee.¹⁷ Much of the land in this area ranges from smooth to rolling, and some of the soils are very erodible.¹⁸ Lincoln County forms part of two of the main physiographic sections of Tennessee: the Highland Rim and the Central Basin.¹⁹

The quality of cotton produced in the counties studied was about the same as that for the state. From 1954 through 1958 about 87.6 per cent of the cotton was white middling and above in grade, and 99.1 per cent ranged from 15/16 inch to 1 3/32 inches in staple length.²⁰

Cultural practices in the two counties were typical of those in other cotton-producing areas of the state. The yield of lint cotton harvested in Madison County from 1954 through 1958 was an average of 452 pounds per acre, and in Lincoln County it was 370 pounds. The average

¹⁶U. S. Department of Agriculture, Climate and Man: 1941 Yearbook of Agriculture (Washington: Government Printing Office, 1941), p. 1120.

¹⁷U. S. Department of Agriculture, Soils and Man: 1938 Yearbook of Agriculture (Washington: Government Printing Office, 1938), p. 1067.

¹⁸Ibid.

¹⁹F. Randolph, L. T. Strickland, and E. F. Henry, Soil Survey of Lincoln County, Tennessee (Knoxville: Tennessee Agricultural Experiment Station, 1946), pp. 2-3.

²⁰U. S. Department of Agriculture, Cotton Division, Cotton Quality Statistics, United States, 1954-1955, Statistical Bulletin No. 170 (Washington: Government Printing Office, February, 1955), p. 31.
Ibid., 1955-1956, Statistical Bulletin No. 202, p. 31.
Ibid., 1956-1957, Statistical Bulletin No. 220, p. 31.
Ibid., 1957-1958, Statistical Bulletin No. 240, p. 34.

for the state for that period was 469 pounds.²¹

Most of the cotton in the area of Lincoln and Madison counties was hand-picked, which was typical for the cotton-producing area of the state.²² The ginning machinery and equipment of the two gins studied were also typical of the other gins of the state. For example, both of the gins studied had seed cotton driers, overhead seed cotton cleaners, burr machines, and lint cleaners, which was standard equipment for the gins of the state.

It is not claimed that the cotton used in this study was truly representative of the entire state, but it was taken from gins that are typical of the major cotton-producing areas of the state.

²¹Tennessee Department of Agriculture, Agricultural Trends in Tennessee, op. cit., pp. 22-23; Marsh, S. T. and others, Tennessee Cotton: Acreage, Yield and Production, 1954, Tennessee Department of Agriculture, Release No. 1541 (Nashville: Federal-State Cooperative Reporting Service, 1955), Ibid., 1957, Release No. 1822, Ibid., 1958, Release No. 1946.

²²Raskopf, Cotton Ginning Industry in Tennessee, op. cit., p. 19.

CHAPTER II

METHODS USED BY GINNERS FOR ASSESSING FOREIGN MATTER IN SEED COTTON

Cottonseed, which less than sixty-five years ago was considered largely a waste by the cotton grower, has become an important source of his cash income. The total farm value of cottonseed produced in Tennessee, 1954 through 1958, averaged \$9,096,000 annually. This amounted to an average of 3.9 per cent of the total value of crops produced.¹ During this period, cottonseed ranked fifth or above in value among crops produced.² The marketing of cottonseed is characterized by directness and simplicity. At the time of harvest the cotton grower takes his seed cotton to the gin where it is cleaned and separated into lint and seed.³ At the time of ginning from 92 to 94 per cent of the cottonseed is sold to the ginner and 6 to 8 per cent is kept by the grower, to be used mainly as seed and feed.⁴ Most of the cottonseed that the ginner buys is sold directly to oil mills.

Many methods are used to determine the weight of cottonseed being sold. Only a small part of the trading between the ginner and grower is settled by weighing the cottonseed. This is especially true in Tennessee,

¹S. T. Marsh, G. D. Collins, and Sam Guy, Cash Receipts From Farming, Tennessee, Release No. 1973 (Nashville: Tennessee Department of Agriculture, September 25, 1959).

²Ibid.

³Harry Eater Brown and Jacob Osborn Ware, Cotton (third edition; New York: McGraw-Hill Book Company, Inc., 1958), pp. 507-508.

⁴S. D. Raskopf, Cotton Ginning Industry in Tennessee, Bulletin No. 303 (Knoxville: Tennessee Agricultural Experiment Station, 1959), pp. 35-37.

since less than $\frac{1}{4}$ per cent of the ginner's operate seed scales.⁵ The weight of the seed purchased by ginner's who do not have seed scales is arrived at principally by estimation, the particular method used being a matter of local custom.⁶

In this chapter an evaluation has been made particularly of the methods used by ginner's for determining foreign matter in seed cotton. The primary purpose of this analysis is to provide a better understanding of what the results of using their different methods are in terms of dollars and cents, to both the ginner and the customer, and to determine if the methods commonly used by ginner's in Tennessee for estimating the weight of cottonseed or the amount of foreign matter in seed cotton give either the ginner or his customers any assurance of accuracy.

A survey of 127 gins in 23 counties in Tennessee in 1958 revealed 22 different methods for determining the amount of foreign matter in hand-picked cotton, 13 methods for hand-snapped cotton, and 10 methods for machine-picked cotton. The locations of these gins are shown in Figure 2.

I. HAND-PICKED COTTON

The estimated weight of foreign matter derived from any given quantity of seed cotton varied considerably with the use of the different methods. By using 1,385 pounds of seed cotton as the average amount of

⁵Richard L. Kohls, Marketing of Agricultural Products (New York: The MacMillan Co., 1955), pp. 301-302.

⁶Ibid.



FIGURE 2

LOCATION OF 127 GINS USED IN STUDYING THE DIFFERENT METHODS FOR ASSESSING FOREIGN MATTER IN COTTON, TENNESSEE, 1954-1958

hand-picked cotton required to produce a 500-pound bale of lint, and \$48.01 as the average price paid for cottonseed, 1954-1958, Table III indicates the variation in deductions made by various methods and the value of these deductions in terms of the price of cottonseed. The range in pounds of foreign matter when figured by the different methods was 0 to 185 pounds, which amounted to differences in value of \$0.00 to \$4.44 per bale ginned. A majority of the ginners used one of three methods: a five, seven, or ten per cent dockage.

The significance of this variation is easier to recognize when it is considered that, from 1954-1958, the average amount of hand-picked cotton ginned in Tennessee was 444,689 running bales or 83.4 per cent of the total.⁷ The largest value in terms of cottonseed of \$4.44 makes up over one-third the average charge for ginning a running bale of cotton, 1954-1958.⁸

II. HAND-SNAPPED COTTON

Table IV presents an evaluation of the 13 different methods of determining the amount of foreign matter in hand-snapped cotton at 127 gins in 23 counties of the state. By using 2,006 pounds of seed cotton as the average amount of hand-snapped cotton required to produce a 500-pound bale of lint, and \$48.01 again as the average price paid for cottonseed, 1954-1958, Table IV indicates the variation in deductions made by

⁷Raskopf, Cotton Ginning Industry in Tennessee, op. cit., p. 19.

⁸Ibid., p. 52.

TABLE III

21

EVALUATION OF DIFFERENT METHODS OF DETERMINING FOREIGN MATTER
IN HAND-PICKED COTTON, 127 GINS, TENNESSEE, 1958^a

Methods of Calculating Weights of Foreign Matter in Hand-Picked Seed Cotton ^b	Ginners Reporting	Foreign Matter	Value of Foreign Matter in Terms of Cottonseed
	No.	Lbs.	
1. No dockage for foreign matter	12	0	0
2. Two per cent of seed cotton	1	27.7	0.66
3. Three per cent of seed cotton	2	41.6	1.00
4. Three to five per cent of seed cotton	2	41.6-69.2	1.00-1.66
5. Three to seven per cent of seed cotton	1	41.6-96.9	1.00-2.33
6. Fifty lbs. dockage of seed cotton per bale of lint	6	50.0	1.20
7. Four per cent of seed cotton	2	55.4	1.33
8. Sixty lbs. dockage per bale	2	60.0	1.44
9. Five per cent of seed cotton	30	69.2	1.66
10. Seventy-five lbs. dockage per bale	2	75.0	1.80
11. Gin for seed	1	80.0	1.92
12. Weight of seed cotton minus lint minus seed scale weight ^c	11	85.9	2.06
13. Seven per cent of seed cotton	18	96.9	2.33
14. Five to eight per cent of seed cotton	1	69.2-110.8	2.33-2.66
15. Five to ten per cent of seed cotton	1	69.2-138.5	2.33-3.32
16. Seed cotton minus lint minus ninety- seven per cent of cottonseed	1	104.2	2.50
17. Eight per cent of seed cotton	9	110.8	2.66
18. Eight to ten per cent of seed cotton	2	110.8-138.5	2.66-3.32
19. Ten per cent of seed cotton	20	138.5	3.32
20. Eleven per cent of seed cotton	1	152.4	3.66
21. Twelve per cent of seed cotton	1	166.2	3.99
22. Seed cotton minus lint minus one and two-fifths of lint	1	185.0	4.44
Total or range	127	0-185.0	0-4.44

^aSource: Based on a questionnaire and field survey of 127 gins in Tennessee by the Tennessee Agricultural Experiment Station, 1958.
B. D. Baskopf, Cotton Ginning Industry in Tennessee, Bulletin No. 303 (Knoxville: Tennessee Agricultural Experiment Station, July, 1959), p. 19.

^bAn average of 1,385 lbs. of hand-picked seed cotton was required to give a 500-lb. bale of lint and 805 lbs. of cottonseed, 1954-1958. (Lint includes 22 lbs. bagging and ties.) Average price of cottonseed was \$48.01 per ton, 1954-1958. Average cost of ginning running bale of cotton was \$19.57, 1954-1958.

^cBased on five-year average per cent foreign matter in hand-picked seed cotton at Towry and Bendis gins which averaged 6.2 per cent for 1954-1958.

TABLE IV

EVALUATION OF DIFFERENT METHODS OF DETERMINING FOREIGN MATTER
IN HAND-SNAPPED COTTON, 127 GINS, TENNESSEE, 1958^a

Methods of Calculating Weights of Foreign Matter in Hand-Snapped Seed Cotton ^b	Ginners Reporting	Foreign Matter	Value of Foreign Matter in Terms of Cottonseed
	No.	Lbs.	\$
1. Five per cent dockage of seed cotton	23	100.3	2.41
2. Seven per cent dockage	11	140.4	3.37
3. Eight per cent dockage	5	160.5	3.85
4. Ten per cent dockage	23	200.6	4.81
5. Twenty per cent dockage	1	401.2	9.63
6. Twenty-five per cent dockage	2	501.5	12.04
7. Thirty per cent dockage	2	601.8	14.44
8. Thirty-three per cent dockage	1	662.0	15.89
9. Seed cotton minus lint minus seed scale weights ^c	11	686.1	16.47
10. Ginned cotton for seed	17	701.0	16.82
11. Seed cotton minus lint minus one and one-half times lint	15	756.0	18.14
12. Seed cotton minus lint minus one and two-fifths times lint	1	806.0	19.34
13. Seed cotton minus lint minus one and one-third times lint	1	840.0	20.16
14. Did not report dockage system	14	-	-
Total or range	127	100.3-840.0	2.41-20.16

^aSource: Based on a questionnaire and field survey of 127 gins in Tennessee by the Tennessee Agricultural Experiment Station, 1958.
B. D. Baskopf, Cotton Ginning Industry in Tennessee, Bulletin No. 303 (Knoxville: Tennessee Agricultural Experiment Station, July, 1959), p. 19.

^bAn average of 2,006 lbs. of hand-snapped seed cotton was required to give a 500-lb. bale of lint and 805 lbs. of cottonseed, 1954-1958. (Lint includes 22 lbs. bagging and ties.) Average price of cottonseed was \$48.01 per ton, 1954-1958. Average cost of ginning running bale of cotton was \$19.57, 1954-1958.

^cBased on five-year average per cent foreign matter in hand-snapped seed cotton at Tewry and Benis gins which averaged 34.2 per cent for 1954-1958.

the various methods and the value of these deductions in terms of the price of cottonseed. The range in dockage of foreign matter was 100 to 840 pounds, which amounted to differences in value of \$2.41 to \$20.16 per bale. The largest value in terms of cottonseed of \$20.16 was more than the average cost of ginning a running bale of cotton, 1954-1958.⁹

A majority of the ginners used one of three methods: a 5 per cent or 10 per cent dockage, or seed cotton minus lint minus one and one-half times lint. From 1954 through 1958 the average amount of hand-snapped cotton ginned in Tennessee was 66,708 running bales or 13.4 per cent of the total.¹⁰

III. MACHINE-PICKED COTTON

Table V presents an evaluation of 10 different methods of determining the amount of foreign matter in machine-picked cotton at 127 gins in 23 counties of the state. By using 1,503 pounds of seed cotton as the average amount of machine-picked seed cotton required to produce a 500-pound bale of lint, and \$48.01 as the average price paid for cottonseed, 1954-1958, Table V indicates the deduction made by the various methods and the value of these deductions in terms of the price of cottonseed. The range in dockage for foreign matter by using different methods was 50 to 375.8 pounds, which amounted to differences in value of \$1.20 to \$9.02 per bale. A majority of the ginners used one method, a ten per

⁹Ibid., pp. 52, 63.

¹⁰Ibid., p. 19.

TABLE V

EVALUATION OF DIFFERENT METHODS OF DETERMINING FOREIGN MATTER
IN MACHINE-PICKED COTTON, 127 GINS, TENNESSEE, 1958^a

Methods of Calculating Weights of Foreign Matter in Machine-Picked Seed Cotton ^b	Ginners Reporting	Foreign Matter	Value of Foreign Matter in Terms of Cottonseed
	No.	Lbs.	
1. Fifty lbs. dockage	2	50.0	1.20
2. Six per cent of seed cotton	1	90.2	2.16
3. Seven per cent of seed cotton	3	105.2	2.52
4. Eight per cent of seed cotton	1	120.2	2.88
5. Eight to ten per cent of seed cotton	2	120.2-150.3	2.88-3.62
6. Ten per cent of seed cotton	29	150.3	3.62
7. Twelve per cent of seed cotton	5	180.4	4.33
8. Seed cotton minus lint minus seed scale weights ^c	11	195.0	4.68
9. Ginned machine-picked for seed	2	198.0	4.75
10. Twenty-five per cent of seed cotton	1	375.8	9.02
11. Did not report dockage system	70	-	-
Total or range	127	50.0-375.8	1.20-9.02

^aSource: Based on a questionnaire and field survey of 127 gins in Tennessee by the Tennessee Agricultural Experiment Station, 1958.
B. D. Raskopf, Cotton Ginning Industry in Tennessee, Bulletin No. 303
(Knoxville: Tennessee Agricultural Experiment Station, July, 1959), p. 19.

^bAn average of 1,503 lbs. of machine-picked seed cotton was required to give a 500-lb. bale of lint and 805 lbs. of cottonseed, 1954-1958. (Lint includes 22 lbs. bagging and ties.) Average price of cottonseed was \$48.01 per ton, 1954-1958. Average cost of ginning running bale of cotton was \$19.57, 1954-1958.

^cBased on five-year average per cent foreign matter in machine-picked seed cotton at Tenny and Bemis gins which averaged 13 per cent for 1954-1958.

cent dockage of seed cotton. The amount of machine-picked cotton ginned in the state is considerably smaller than that of either hand-picked or hand-snapped cotton. For example, in 1954-1958 the average amount of machine-picked cotton ginned annually was 16,574 running bales or 3.2 per cent of the total.¹¹

It must be kept in mind that the true results of using the various methods of determining the amount of foreign matter in seed cotton may be misleading. For example, ginners sometimes pay more for the cotton lint than they can sell it for at the time of purchase and then recoup their losses by paying lower prices for cottonseed.¹² Also, profits made on high dockage for foreign matter may be used by the ginner to offset losses incurred in the use of lower ginning rates.¹³ Generally speaking, however, if the method of determining the amount of foreign matter in seed cotton causes the dockage to be too small, the farmer profits, or if too large, the ginner profits.

The evidence presented in this chapter supports the hypothesis that none of the methods commonly used by ginners in Tennessee for determining the weight of cottonseed or the amount of foreign matter in seed cotton gives any assurance of accuracy to the ginner or customer, except the method of weighing both the lint and cottonseed.

¹¹Ibid., p. 19.

¹²Ibid.

¹³James F. Hudson, Marketing of Cottonseed in Louisiana, Bulletin No. 400 (Baton Rouge: Louisiana Agricultural Experiment Station, January, 1946), p. 21.

CHAPTER XII

FOREIGN MATTER CONTENT IN SEED COTTON AT ONE GIN IN LINCOLN COUNTY

In this chapter an examination has been made of some of the characteristics of the area surrounding the Towry gin located in Lincoln County, Tennessee. The intent of this examination was to provide a setting for understanding and evaluating the variation in the amount of foreign matter in seed cotton by years, seasons, and methods of harvesting.

I. CHARACTERISTICS OF AREA

Lincoln County is located in the south-central part of Tennessee. The county covers a total area of 574 square miles or 367,360 acres. The state of Alabama borders it on the south. It is roughly square in shape with a semi-circular boundary on the north. The greatest distance from north to south is about 26 miles and from east to west is 29 miles. In 1958 there were 192,562 acres of cropland in the county.¹ It forms a part of two of the main physiographic sections of Tennessee, (1) the Highland Rim, and (2) the Central Basin. The elevation of the Highland Rim in this county ranges from about 900 to 1,000 feet, and that of the Central Basin from about 600 to 700 feet.²

The climate is temperate and continental. The winters are mild with short cold periods, and the summers are warm with occasional hot

¹Tennessee ASC Committee, Tennessee Annual Statistical Report ASC Programs, 1958, U. S. Department of Agriculture (Washington: Government Printing Office, September, 1959), pp. 2-3, 47-48.

²F. Randolph, L. T. Strickland, and E. F. Henry, Soil Survey of Lincoln County, Tennessee (Knoxville: Tennessee Agricultural Experiment Station, 1946), pp. 2-3.

periods. The annual precipitation for Lincoln County is over 50 inches.³ For the last 37 years the average January temperature has been 41° F., and the average July temperature has been 78° F. Also, for this same period the last killing frost in the spring was around April 7, and the first killing frost in the fall was around October 26. The average growing season for the same period was 202 days.⁴

Silt loams make up about three-fourths of the area of the county. The rest is composed of loams, silty clay loams, loamy fine sands, and very fine sandy loams.

Fayetteville, the county seat and the largest city, has a population of 6,018.⁵

Agriculture furnishes 51.2 per cent of the employment for the working population of the county. The chief cash-yielding enterprises in the county are the raising of crops and livestock. The value of crops, of which cotton makes up an important part, is almost three million dollars annually. The median family income was \$1,479 in 1950, which was about three-fourths of the state average of \$1,983.⁶ Lincoln County is not densely populated, with only 44 people per square mile, of

³U. S. Department of Commerce, Climatological Data, Tennessee, 1957-1958, Vol. LXII, No. 13, U. S. Weather Bureau (Washington: Government Printing Office, 1957-1958), pp. 180-181.

⁴U. S. Department of Agriculture, Climate and Man: 1941 Yearbook of Agriculture (Washington: Government Printing Office, 1941), p. 1119.

⁵Rand McNally and Co., Rand McNally Commercial Atlas and Marketing Guide, (nintieeth edition; New York: Rand McNally and Co., 1959), p. 411.

⁶U. S. Bureau of the Census, County and City Data Book, 1956, A Statistical Abstract Supplement (Washington: Government Printing Office, 1957), p. 266.

whom over 70 per cent live in rural areas.⁷

The average number of farms growing cotton in Lincoln County, 1954-1958, was 2,028 (Table VI). During those years, there was an average of 10,580 bales of cotton ginned per year (Table VII). Also, over 90 per cent of the estimated cotton acreage grown in this county was devoted to four varieties: Empire, Deltapine, Stoneville, and Coker 100W (Table VIII).

II. FOREIGN MATTER IN TOTAL COTTON

Average and range of foreign matter by years. In examining the variation of foreign matter in seed cotton by years at the Towry gin it was found that the amount varied considerably (Figure 3). In 1954 the average amount of foreign matter in the cotton was 7.6 per cent with a range among individual bales from 0 to 48.5 per cent. In 1955 the amount of foreign matter averaged 7.5 per cent with a range among bales of 0.1 to 41.4 per cent. In 1956 the average amount of foreign matter decreased to 6.6 per cent with a range among bales of 0.1 to 39.7 per cent. In 1957 there was a large increase in the amount of foreign matter. This increase was from 6.6 per cent in 1956 to 16.5 per cent in 1957. The range in foreign matter among individual bales for 1957 was 0 to 47.6 per cent. The range during 1957 was less than 1954, but the average per cent of foreign matter in 1957 was more than double that of 1954, 1955, or 1956. One of the major causes associated with this large increase

⁷Rand McNally and Company, op. cit., p. 407.

TABLE VI

NUMBER OF FARMS GROWING COTTON AND MEASURED COTTON ACREAGE
BY YEARS, LINCOLN COUNTY, TENNESSEE, 1954-1958^a

Year	Farms Growing Cotton No.	Measured Cotton Acreage Less Acreage Destroyed to Comply with Allotments Acres
1954	1,999	14,613
1955	2,031	12,993
1956	2,061	12,338
1957	2,008	10,817
1958	2,021	8,349
5-Year Average	2,028	11,822

^aSource: Tennessee ASC Committee, Tennessee Annual Statistical Report ASC Programs, 1954, 1955, 1956, 1957, and 1958, U. S. Department of Agriculture (Washington: Government Printing Office, 1954-1958); 1954, pp. 57-58; 1955, pp. 58-59; 1956, pp. 58-59; 1957, pp. 48-49; 1958, pp. 47-48.

TABLE VII
AMOUNT OF COTTON GINNED, BY GINNING PERIODS,
LINCOLN COUNTY, TENNESSEE, 1954-1958^a

Ginning Period	1954	1955	1956	1957	1958
Bales of Cotton Ginned					
Sept. 1-15	1,347	200	365	480	^b
Sept. 16-30	4,036	3,273	2,490	1,237	248
Oct. 1-17	3,190	4,570	4,028	2,290	1,615
Oct. 18-31	1,589	3,910	2,064	1,366	1,686
Nov. 1-13	411	1,962	1,490	1,720	645
Nov. 14-30	104	620	1,360	868	797
Dec. 1-12	17	182	663	415	522
Dec. 13-Mar. 20	39	246	173	603	780
Total	10,733	14,863	12,633	8,979	6,293

^aSource: U. S. Bureau of the Census, Cotton Production in the United States, 1954, 1955, 1956, 1957, and 1958 (Washington: Government Printing Office, 1955-1959); 1954, p. 33; 1955, p. 33; 1956, p. 33; 1957, p. 34; 1958, p. 35.

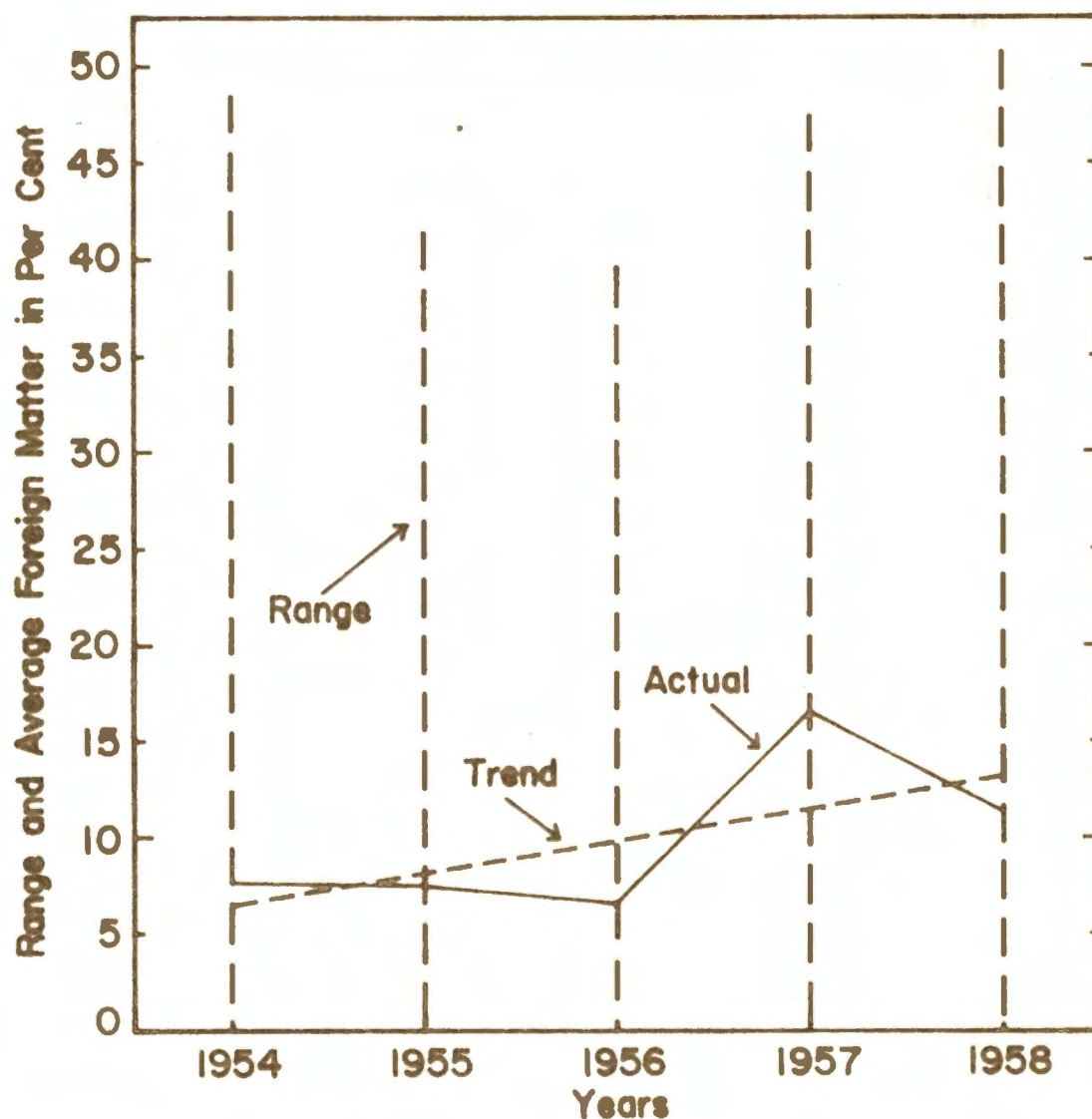
^bIncluded in Sept. 16-30 period.

TABLE VIII

ESTIMATED PERCENTAGE OF COTTON ACREAGE PLANTED TO SPECIFIED VARIETIES,
LINCOLN COUNTY, TENNESSEE, 1954-1958^a

Year	Deltapine	Empire	Hibred	Stoneville	Coker		Total
					100W	Other	
Estimated Percentage of Varieties Grown							
1954	9	38	6	29	14	4	100
1955	11	40	6	24	16	3	100
1956	6	50	5	15	16	8	100
1957	32	37	2	9	20	0	100
1958	26	58	2	0	10	4	100
5-Year Average	16.8	44.6	4.2	15.4	15.2	3.8	100

^aSource: U. S. Department of Agriculture, Cotton Varieties Planted, 1954, 1955, 1956, 1957, and 1958 (Memphis: Agricultural Marketing Service, Cotton Division, 1954-1958), pp. 14-15.



Trend: $Y_c = 9.9 + 1.7X$; Origin, 1956.

FIGURE 3

RANGE AND AVERAGE PER CENT OF FOREIGN MATTER IN TOTAL COTTON,
BY YEARS, TOWRY GIN, LINCOLN COUNTY, TENNESSEE, 1954-1958
(BASED ON DATA IN APPENDIX D)

in 1957 was the amount of rainfall during the harvesting season.⁸ For example, in September of 1957 the average precipitation was 4.2 inches above a 30-year average; and in November the precipitation was 9.2 inches above the 30-year average. The average annual precipitation for Lincoln County in 1957 was 63.7 inches, which was 10.0 inches above the 30-year average for this county.⁹ In 1958 the average per cent of foreign matter in seed cotton decreased from 16.5 in 1957 to 11.4. This was a larger per cent than in 1954, 1955, or 1956. When a trend line was constructed representing the per cent of foreign matter for the five years by the least squares method, it was found to have a positive slope. This upward trend was probably due to the adverse weather conditions in 1957, lack of care in harvesting, and a larger per cent of hand-snapped cotton handled.

Five-year averages of foreign matter by ginning periods. An examination was made of the variation of foreign matter in cotton during the ginning periods for five years at the Towry gin.¹⁰ It was found that the per cent of foreign matter varied considerably among ginning periods

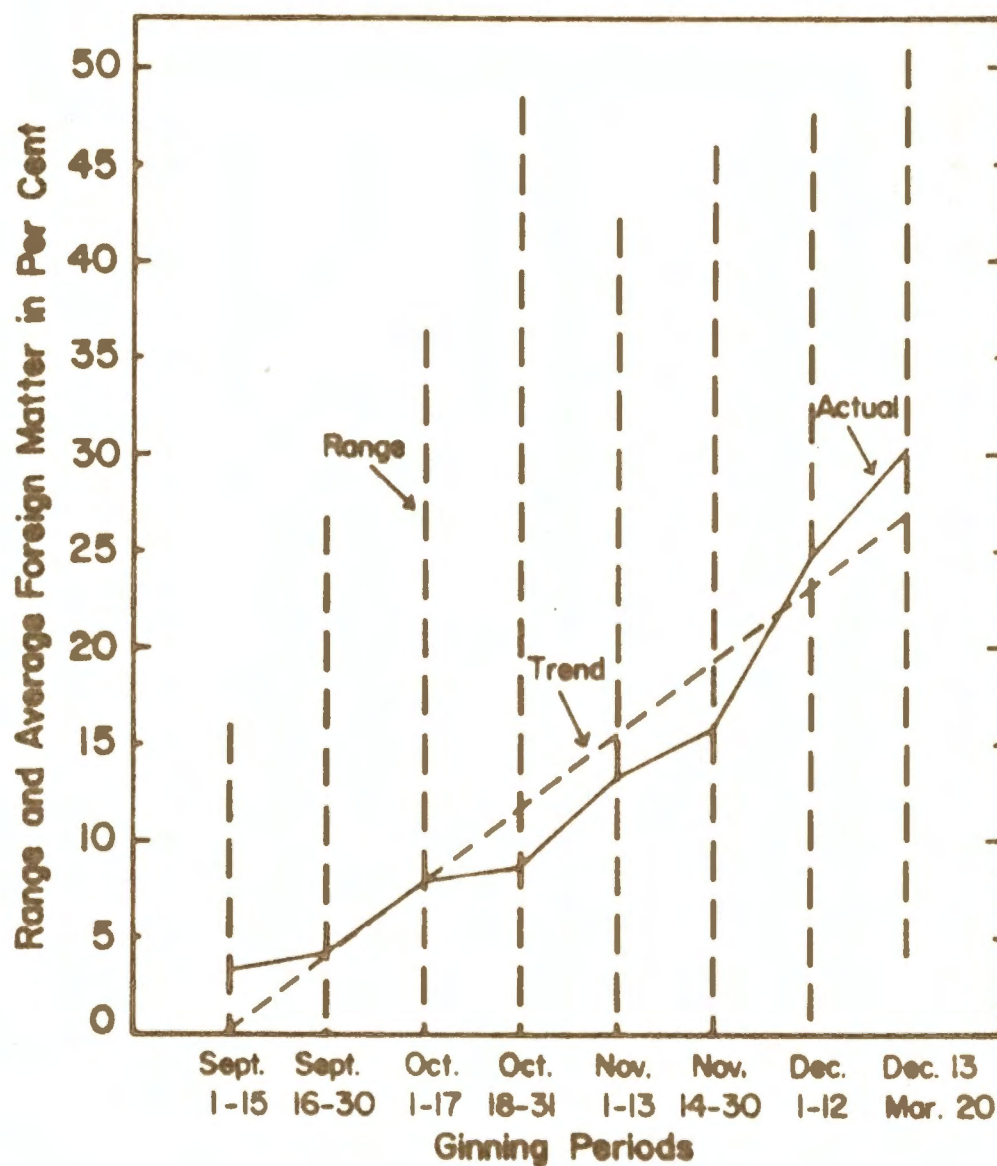
⁸A linear correlation between the total number of days that it rained from August 1 to January 1 of each year and per cent of foreign matter for each year resulted in an $r = .967$. $1 - r^2 = .026$. Coefficient of determination, $r^2 = .974$. When regression analysis was applied to this data, it was found that $b = .44$. The standard error of estimate, $Sy \cdot x = .92$.

⁹U. S. Department of Commerce, Climatological Data, Tennessee, Ibid., p. 183.

¹⁰The average per cent foreign matter for each period was obtained by dividing the total pounds of foreign matter for five years for this period by the total pounds of seed cotton for five years for this period. The ranges for the periods are for individual bales.

(Figure 4). For example, during the September 1 to 15 ginning period the proportion of foreign matter averaged 3.3 per cent with a range of 0 to 16 per cent; and during the December 13 to March 20 ginning period, the average was 30.4 per cent with a range of 4.2 to 50.8 per cent. This was a difference of 27.1 per cent in average foreign matter from beginning to end of ginning season. When the entire ginning season was examined by each period, it was found that as the season progressed, the average per cent of foreign matter in the cotton in each period increased over the previous one.

When a trend line was constructed representing the foreign matter for the entire ginning season for the five years studied, it was found to be positively sloped. That is, if the origin for the trend line was taken to be midway between the ginning periods of October 18-31 and November 1-13, it was found that for each one-half ginning period that was moved along the trend line toward the end of the season from the origin, the average per cent of foreign matter in seed cotton increased by 1.9 per cent. However, none of the true averages for the ginning periods fell exactly on the calculated trend line, although two came very close to it. The averages ranged from 3.4 per cent above the trend line to 3.3 per cent below. From the data presented here it appears that the per cent of foreign matter in seed cotton from one ginning period to the next does not increase at a constant rate, decreasing rate or increasing rate throughout the entire season, but varies, either increasing at a decreasing rate or at an increasing rate from one ginning period to another throughout the ginning season (Figure 4).



Trend: $Y_c = 13.6 + 1.9X$; Origin, Oct. 18-31 to Nov. 1-13;
 X units, $\frac{1}{2}$ ginning period.

FIGURE 4

FIVE-YEAR RANGE AND AVERAGE PER CENT OF FOREIGN MATTER
 IN TOTAL COTTON, BY GINNING PERIODS, TOWRY GIN,
 LINCOLN COUNTY, TENNESSEE, 1954-1958
 (BASED ON DATA IN APPENDIX D)

Foreign matter within each season by ginning periods. When an examination was made of the average per cent of foreign matter by ginning periods for each of the years studied, it was found that there was considerable variation both among ginning periods of the same year and among different years for the same ginning period (Table IX). In 1954 there was a variation in foreign matter from an average of 2.9 per cent in the period September 1-15 to 26.5 per cent for November 14-30, a range of 23.6 per cent.

In 1955 the foreign matter content varied from an average of 3.4 per cent in the September 16-30 period to 31.8 per cent in the December 13-March 20 period, a range of 28.4 per cent. The proportion of foreign matter decreased from the first ginning period of the season to the second, but then increased for the rest of the periods throughout the season. The range also widened as the season progressed.

In 1956 the foreign matter content varied from an average of 1.7 per cent in the September 1-15 period to 28.4 per cent in the December 1-12 period, a range of 26.7 per cent. The foreign matter from period to period changed at a variable rate. It increased from the first ginning period through the October 1-17 period. Then there was a slight decrease at the next period, but from then through the December 1-12 period there was an increase. When the data for the entire season were examined, it was found that the trend was upward as the season progressed. However, this increase was not constant from period to period. For example, between the November 14-30 period and the December 1-12 period, the proportion of foreign matter content more than doubled.

TABLE IX

VARIATION IN RANGE AND AVERAGE PER CENT OF FOREIGN MATTER IN TOTAL COTTON, BY GINNING PERIODS,
WITHIN EACH SEASON, TOWRY GIN, LINCOLN COUNTY, TENNESSEE, 1954-1958^a

Crop Year	Bales and Foreign Matter	September		October		November		December-March 20	
		1-15	16-30	1-17	18-31	1-13	14-30	Dec. 1-12	Dec.-Mar. 13-20
1954	No. Bales	121	350	228	94	24	7	1	b
	Avg. %	2.9	4.2	9.2	15.5	20.8	26.5	8.2	-
	Range	0.6-8.7	0.0-27.0	0.3-34.6	0.6-48.5	4.6-42.4	5.8-44.3	0	-
1955	No. Bales	7	141	153	100	66	47	7	16
	Avg. %	4.2	3.4	4.2	5.5	10.5	15.8	25.6	31.8
	Range	1.1-10.3	0.1-17.2	0.1-16.9	0.1-29.3	0.1-41.4	0.1-37.3	1.5-39.5	7.5-41.0
1956	No. Bales	5	145	220	115	79	44	23	-
	Avg. %	1.7	4.4	4.8	4.5	6.7	12.8	28.4	-
	Range	1.2-7.9	0.1-10.9	0.3-16.5	0.2-28.4	0.7-33.2	0.5-30.1	3.4-39.7	-
1957	No. Bales	24	65	93	58	56	32	12	11
	Avg. %	5.1	5.8	15.9	12.1	22.8	25.2	28.1	38.1
	Range	0.0-16.0	2.0-14.6	0.4-28.2	1.2-38.5	2.3-38.0	1.4-46.0	1.6-47.6	25.2-47.3
1958	No. Bales	-	6	83	33	29	37	33	23
	Avg. %	-	9.5	7.5	5.9	9.3	8.3	20.7	25.1
	Range	-	3.4-15.1	0.4-36.5	0.2-8.8	1.3-36.0	1.1-40.8	0.8-40.1	4.2-50.8

^aSource: Appendix D.

^bNo data available at Towry gin during this period.

In 1957 the foreign matter content varied from an average of 5.1 per cent in the September 1-15 period to 38.1 per cent in the December 13-March 20 period, a range of 33 per cent. In this year it was found that it increased from the beginning of the season through the October 1-17 period, but then decreased at the next period, as it had done in 1956. The trend for foreign matter content was upward as the season progressed, but the increase in foreign matter content was variable, and in one period it decreased from the previous period. Between the September 16-30 period and the October 1-17 period of 1957, the average per cent more than doubled.

In 1958 the foreign matter content varied from an average of 5.9 per cent during October 18-31 to 25.1 per cent during December 13-March 20, a range of 19.2 per cent. In this year, as well as in the other four studied, it was found that from period to period it changed at a variable rate. When all the ginning periods of 1958 were considered together, the trend was upward from beginning to end of the ginning season.

When an analysis of variance was made of the variation of foreign matter content among ginning periods for the five years studied and the variation among the total foreign matter content for each year, it was found that the averages of the foreign matter content of the ginning periods and for each of the different years were significantly different at the 95 per cent level of probability.¹¹

¹¹The hypothesis of no difference among means of different years is rejected if $F_{.95}(4,28) \geq 2.69$. The F ratio was equal to $103.6 \div 22.4 = 4.62$. So the hypothesis of no difference among means of different

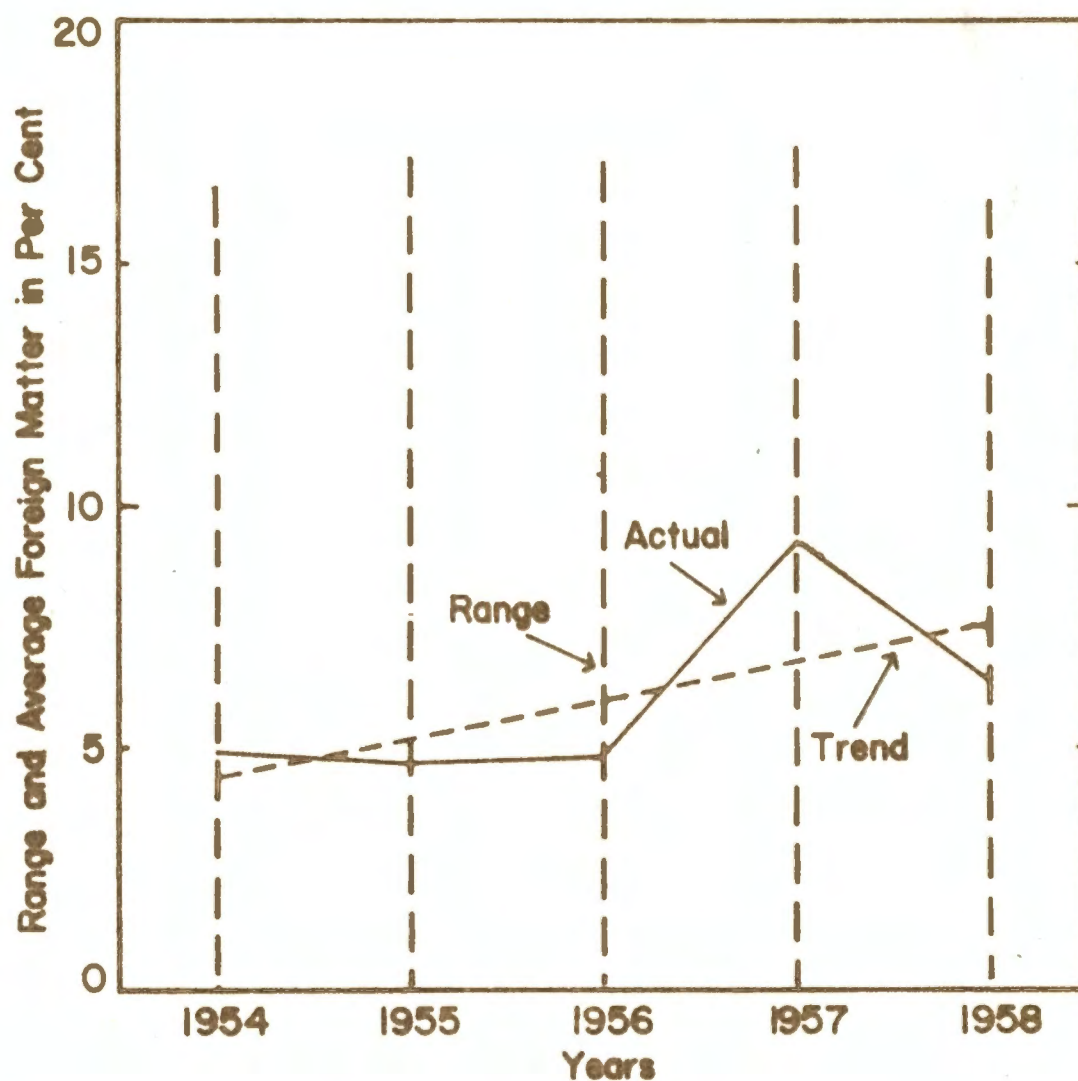
XIII. FOREIGN MATTER IN PICKED COTTON

Average and range of foreign matter by years. The discussion in this chapter so far has been devoted to the content of foreign matter in total cotton which includes both picked and snapped cotton. When the data were broken down into picked cotton by years, 1954-1958, at the Towry gin in Lincoln County, Tennessee, it was found that the foreign matter content varied considerably during some years (Figure 5). The average per cent of foreign matter in the picked cotton remained about the same for the years 1954, 1955, and 1956, but in 1957 there was a large increase. For example, it averaged 4.8 per cent in 1956 and almost doubled to 9.3 per cent in 1957. In 1958 there was an average of 6.5 per cent, which was 2.8 per cent less than 1957, but still more than in the earlier years. When a trend line was constructed for the entire ginning season for the five years studied, it was found to increase as the season advanced (Figure 5).

Five-year averages of foreign matter by ginning periods. A large variation was also found when the per cent of foreign matter in picked cotton was broken down into ginning periods for the five years studied (Figure 6). When a trend line was fitted to the data by the least squares method, the trend was upward. The range in per cent of foreign

years was rejected, and it was concluded that there is evidence to believe that they are significantly different.

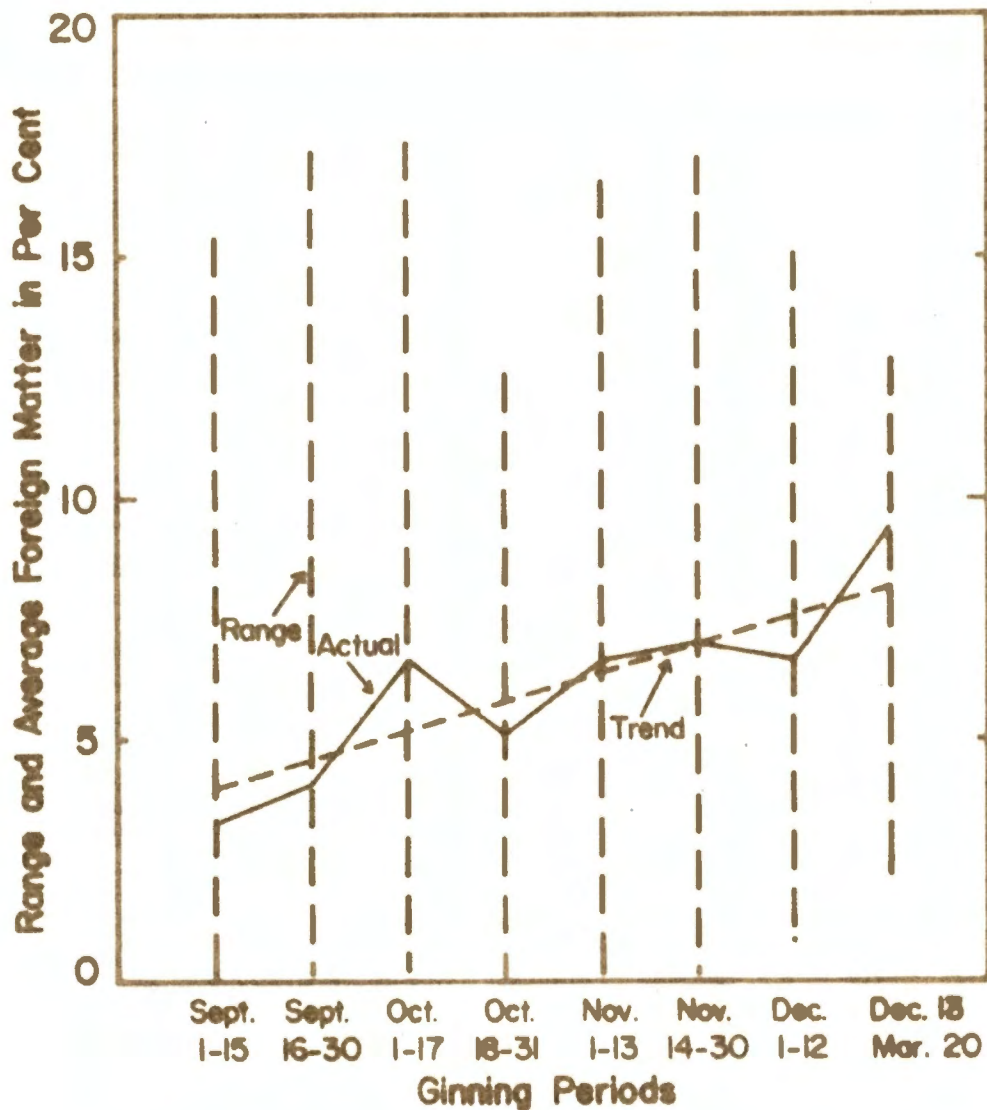
The hypothesis of no difference among means of different ginning periods is rejected if $F_{.05}(7,28) \geq 2.33$. The F ratio was equal to $347.3 \div 22.4 = 15.5$. So the hypothesis of no difference among means of different ginning periods was rejected, and it was concluded that there is evidence to believe that they are significantly different.



Trend: $Y_c = 6.0 + .8X$; Origin, 1956.

FIGURE 5

RANGE AND AVERAGE PER CENT OF FOREIGN MATTER IN PICKED COTTON,
BY YEARS, TOMMY GIN, LINCOLN COUNTY, TENNESSEE, 1954-1958
(BASED ON DATA IN APPENDIX E)



Trend: $Y_c = 6.1 + .3X$; Origin, Oct. 18-31 to Nov. 1-13;
 X units, $\frac{1}{2}$ ginning period.

FIGURE 6

FIVE-YEAR RANGE AND AVERAGE PER CENT OF FOREIGN MATTER
 IN PICKED COTTON, BY GINNING PERIODS, TOWRY GIN,
 LINCOLN COUNTY, TENNESSEE, 1954-1958
 (BASED ON DATA IN APPENDIX E)

matter among bales in the same ginning period and among ginning periods varied greatly.

Foreign matter within each season by ginning periods. Tabulation was made of the variation in the average per cent and range of foreign matter in picked cotton among ginning periods of the same year and among the same ginning periods of different years from records at the Towry gin in Lincoln County, Tennessee, 1954-1958 (Table I). This examination was made to determine how the amount of foreign matter varied with method of harvest. When the data for the five years were analyzed, it was found that there was a considerable variation in per cent of foreign matter in picked cotton during ginning periods of the same year but less than was found in total cotton. In 1954 the variation among ginning periods varied from 2.9 per cent to 9.0 per cent. The trend was upward, but there was considerable variation in the increase from one period to the next.¹²

In 1955 the foreign matter content varied from 3.4 per cent in the September 16-30 ginning period to 10.8 per cent in the December 13-March 20 ginning period, an increase of 7.4 per cent. The trend was upward, but not steady; in some periods it increased or decreased greatly and in others it only changed by a fraction of a per cent.

In 1957 the foreign matter content varied from 5.1 per cent in the September 1-15 ginning period to 15.3 per cent in the October 1-17

¹²In some of the ginning periods very few bales were studied because the data were not available.

TABLE X

VARIATION IN RANGE AND AVERAGE PER CENT OF FOREIGN MATTER IN PICKED COTTON, BY GINNING PERIODS,
WITHIN EACH SEASON, TOWHY GIN, LINCOLN COUNTY, TENNESSEE, 1954-1958^a

Crop Year	Bales and Foreign Matter	September			October			November			December-March 20	
		1-15	16-30	1-17	18-31	1-13	14-30	1-12	13-20	21-31	Dec.- Mar.	13-20
1954	No. Bales	121	345	204	67	14	3	1	b			
	Avg. %	2.9	3.9	6.6	6.9	8.4	9.0	8.2	-			
	Range	0.0-8.7	0.0-14.6	0.3-15.5	0.6-11.6	4.6-14.6	5.8-16.6	0	-			
1955	No. Bales	7	141	153	97	57	33	3	4			
	Avg. %	4.2	3.4	4.2	4.6	7.1	7.4	4.0	10.8			
	Range	1.1-10.3	0.1-17.2	0.2-16.9	0.1-12.6	0.1-10.9	0.1-15.0	1.5-9.1	7.5-12.9			
1956	No. Bales	5	145	220	113	77	37	7	-			
	Avg. %	1.7	4.4	4.8	4.0	5.9	6.9	6.1	-			
	Range	1.2-8.0	0.1-12.3	0.3-16.5	0.2-12.2	0.7-15.8	0.5-17.1	3.4-11.8	-			
1957	No. Bales	24	65	89	45	26	12	5	-			
	Avg. %	5.1	5.8	15.3	5.8	8.0	7.5	7.0	-			
	Range	0.0-16.0	2.0-14.6	0.4-17.4	1.2-10.7	2.3-16.6	1.4-16.9	1.6-11.3	-			
1958	No. Bales	-	6	79	33	26	35	18	10			
	Avg. %	-	9.5	6.3	5.9	5.5	6.4	7.1	8.9			
	Range	-	3.4-15.1	0.4-16.3	0.2-8.8	1.3-8.0	1.1-14.8	0.8-15.2	4.2-11.4			

^aSource: Appendix E.

^bNo data available during this period at the Towhy gin.

ginning period, a range of 10.2 per cent. It varied only slightly from period to period, except for the excessive increase in October 1-17. During this period, it rained seven different days .01 inch or more, and the temperature was 4.3° F. below normal.¹³

In 1958 the foreign matter content varied from 5.5 per cent in the November 1-13 period to 9.5 per cent in the September 16-30 period, a difference of 4.0 per cent, and unusual in that it was highest in the early period of September 16-30. As the ginning season progressed, the foreign matter content gradually decreased until the November 1-13 period and then increased throughout the rest of the season.

When an analysis of variance was made of the variation of the average per cent of foreign matter in picked cotton among ginning periods for the five-year period and the variation among the years, it was found that the averages of the foreign matter content of the ginning periods in the same year and for each of the different years were significantly different at the 90 per cent level of probability.¹⁴

¹³U. S. Department of Commerce, Climatological Data, Tennessee, op. cit., pp. 178-184.

¹⁴The hypothesis of no difference among means of different years is rejected if $F_{.90}(4,28) \geq 2.14$. The ratio was equal to $9.2 \div 3.6 = 2.56$. So the hypothesis of no difference among means of different years was rejected, and it was concluded that there is evidence to believe that they are significantly different.

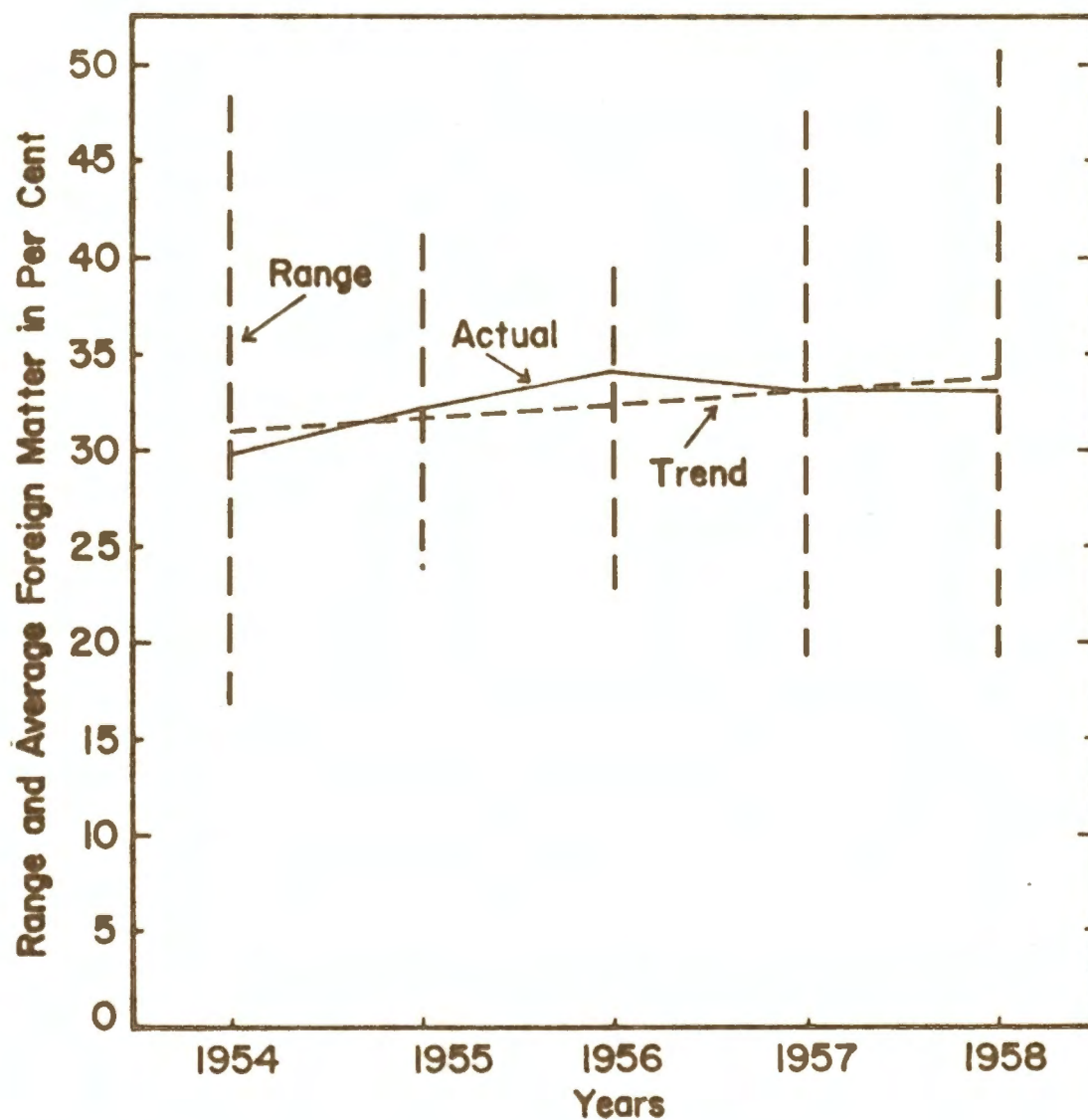
The hypothesis of no difference among means of different ginning periods is rejected if $F_{.90}(7,28) \geq 1.93$. The F ratio was equal to $10.6 \div 3.6 = 2.94$. So the hypothesis of no difference among means of different ginning periods was rejected, and it was concluded that there is evidence to believe that they are significantly different.

IV. FOREIGN MATTER IN SNAPPED COTTON

Average and range of foreign matter by years. When an examination was made of the data relating to snapped cotton by years, it was found that the per cent of foreign matter was much higher than in picked cotton; but the variation in per cent of foreign matter was much less than in picked cotton (Figure 7). When the trend was calculated, it was found that over the five-year period it was slightly upward.

Five-year averages of foreign matter by ginning periods. When the data relating to the amount of foreign matter in snapped cotton was examined by ginning periods, it was found that there was a difference of 15.8 per cent from the beginning to the end of the ginning season (Figure 8). As the season advanced, the per cent of foreign matter increased from period to period. It is shown in Figure 8 that the per cent of foreign matter varied considerably from bale to bale and from one ginning period to another. When a trend line was constructed, using as its origin November 1-13, for each change from one ginning period to another, the per cent of foreign matter increased or decreased by 2.3 per cent, depending upon the direction moved along the trend line.

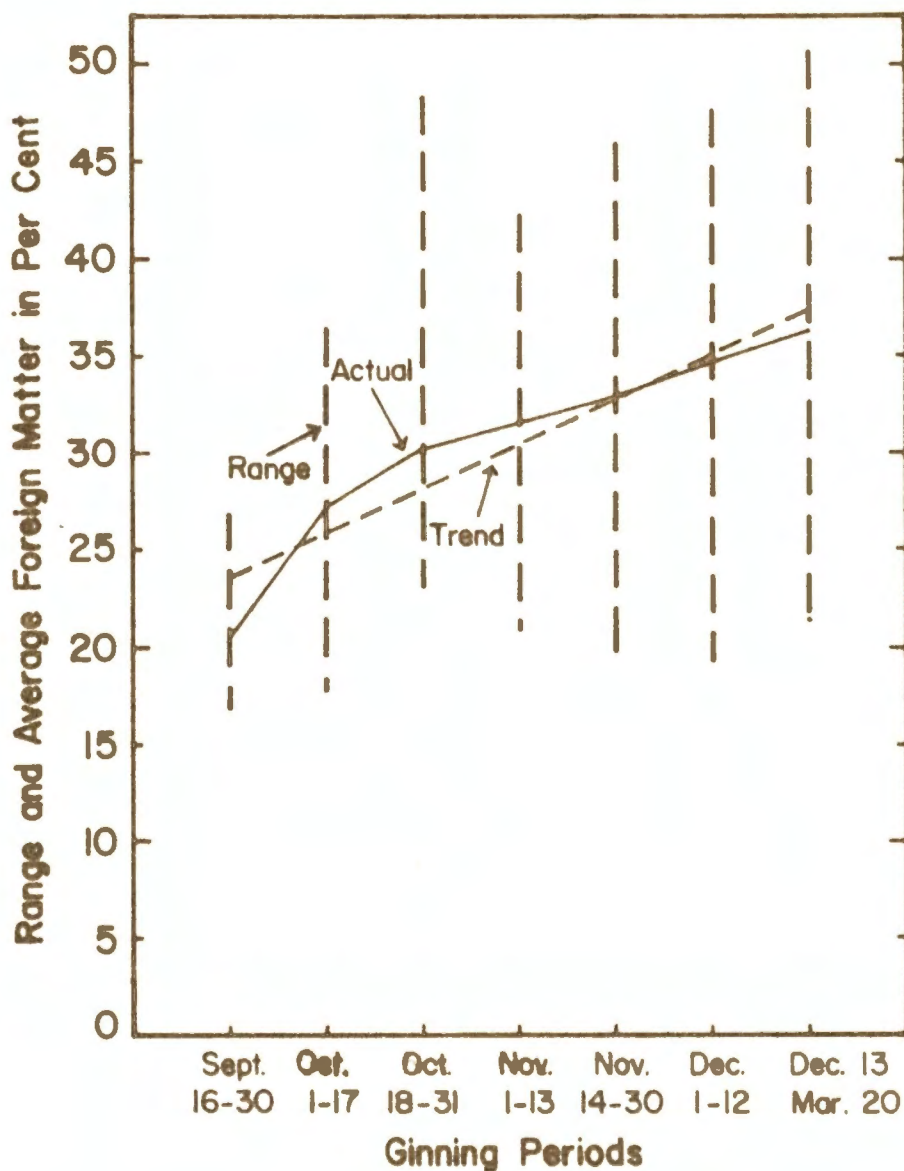
Foreign matter within each season by ginning periods. A tabular analysis was made of the variation in the average per cent and range of foreign matter in snapped cotton among ginning periods of the same year and among the same ginning periods of different years at the Towry gin in Lincoln County, Tennessee, 1954-1958 (Table XI). When the ginning periods for each year were examined, it was found that as the season progressed, the average per cent of foreign matter increased and was



Trend: $Y_c = 32.4 + .7X$; Origin, 1956.

FIGURE 7

RANGE AND AVERAGE PER CENT OF FOREIGN MATTER IN SNAPPED COTTON, BY YEARS,
TOWRY GIN, LINCOLN COUNTY, TENNESSEE, 1954-1958
(BASED ON DATA IN APPENDIX F)



Trend: $Y_c = 30.5 + 2.3X$; Origin, Nov. 1-13.

FIGURE 8

FIVE-YEAR RANGE AND AVERAGE PER CENT OF FOREIGN
MATTER IN SNAPPED COTTON, BY GINNING
PERIODS, TOWRY GIN, LINCOLN COUNTY,
TENNESSEE, 1954-1958
(BASED ON DATA IN
APPENDIX F)

TABLE XI

VARIATION IN RANGE AND AVERAGE PER CENT OF FOREIGN MATTER IN SHIPPED COTTON, BY GINNING PERIODS,
WITHIN EACH SEASON, TOWRY GIN, LINCOLN COUNTY, TENNESSEE, 1954-1958^a

Crop Year	Bales and Foreign Matter	September			October			November			December-March 20		
		1-15	16-30	1-17	18-31	1-13	14-30	1-13	14-30	Dec. 1-12	Dec.-Mar. 13-20		
1954	No. Bales	b	5	24	27	10	4			-	-		
	Avg. %	-	20.5	27.4	31.3	32.3	36.4			-	-		
	Range	-	16.8-27.0	17.6-34.6	29.7-48.5	26.7-42.4	32.6-44.3			-	-		
1955	No. Bales	-	-	-	3	9	14			4	12		
	Avg. %	-	-	-	27.1	27.6	30.4			35.4	36.9		
	Range	-	-	-	25.0-29.3	23.8-41.4	25.7-37.3			32.5-39.5	35.3-41.0		
1956	No. Bales	-	-	-	2	2	7			16	-		
	Avg. %	-	-	-	28.3	30.6	35.3			34.4	-		
	Range	-	-	-	28.1-28.4	28.1-33.2	34.5-38.1			22.9-39.7	-		
1957	No. Bales	-	-	4	13	30	20			7	11		
	Avg. %	-	-	26.1	28.4	32.3	33.0			40.5	38.1		
	Range	-	-	19.3-28.2	23.0-38.5	20.9-38.0	19.6-46.0			35.7-47.6	25.2-47.3		
1958	No. Bales	-	-	4	-	3	2			15	13		
	Avg. %	-	-	27.0	-	34.0	35.3			32.8	34.3		
	Range	-	-	22.4-36.5	-	28.7-36.0	30.5-40.1			19.2-40.1	21.3-50.8		

^aSource: Appendix F.

^bNo data available at Towry gin during these periods.

much higher in snapped cotton than in picked cotton. It changed at a variable rate from one ginning period to another each year.

When an analysis of variance was made of the variation of foreign matter content in snapped cotton among ginning periods for the five years studied, it was found that the differences among the averages of ginning periods were slightly different at the 95 per cent level of probability.¹⁵

It was also found that the differences among the means of the foreign matter content for each of the different years were not significantly different at the 95 per cent level of probability.¹⁶

¹⁵The hypothesis of no difference among means of different ginning periods is rejected if $F_{.95}(6,24) \geq 2.51$. The F ratio was equal to $65.5 \div 20.5 = 3.2$. So the hypothesis of no difference among means of different ginning periods was rejected, and it was concluded that there is evidence to believe that they are significantly different.

¹⁶The hypothesis of no difference among means of different years is rejected if $F_{.95}(4,24) \geq 2.78$. The F ratio was equal to $8.1 \div 20.5 = .39$. So the hypothesis of no difference among means of different years was accepted, and it was concluded that there is evidence to believe that they are not significantly different.

CHAPTER IV

FOREIGN MATTER CONTENT IN SEED COTTON AT ONE GIN IN MADISON COUNTY

In this section an examination has been made of some of the characteristics of the area surrounding the Bemis gin located in Madison County, Tennessee. The intent of this examination was to provide a setting for understanding and evaluating the analysis of the variation in the amount of foreign matter in seed cotton by seasons, ginning periods, and methods of harvesting.

I. CHARACTERISTICS OF AREA

Madison County lies in the west-central part of the state (Figure 1). The eastern and southern parts of the county are rough and hilly; the central, western, and northern parts, comprising about two-thirds of the county, are gently rolling in topography. The county lies within the Mississippi River Basin, and the drainage is toward the west.¹ The county covers a total area of 359,104 acres or about 561 square miles.² In 1958 it had 187,064 acres of cropland.³

The soils of Madison County are divided into the upland soils, which are made up primarily of the Memphis silt loam and Lexington silt

¹W. S. Lyman and others, Soil Survey of Madison County, Tennessee, Series 1906 (Washington: Government Printing Office, 1907), p. 5.

²U. S. Bureau of the Census, County and City Data Book, 1956, A Statistical Abstract Supplement (Washington: Government Printing Office, 1957), p. 407.

³Tennessee ASC Committee, Tennessee Annual Statistical Report ASC Programs, 1958, U. S. Department of Agriculture (Washington: Government Printing Office, September, 1959), pp. 2-3.

loam, and the bottomland soils, which are primarily Waverly loam and Waverly silt loam.⁴

The climate is temperate and continental. The summers are long; the winters mild and short. The annual precipitation for Madison County is over 50 inches.⁵ The annual average temperature for the past 37 years is 55° F.⁶ The last killing frost in the spring is around April 6, and the first killing frost in the fall is around October 25. The average growing season is 202 days.⁷

Jackson, the county seat and largest city, has a population of 30,207.⁸

Agriculture furnishes about 22 per cent of the employment for the working population of the county. The chief cash-yielding enterprise in the county is the raising of crops. The value of crops, of which cotton makes up an important part, is over five and one-half million dollars annually. The median family income was \$2,057 in 1950, which was a little more than the state average of \$1,983.⁹ Madison County is not densely populated with only 107 people per square mile, of whom

⁴W. S. Lyman, op. cit., p. 9.

⁵U. S. Department of Commerce, Climatological Data, Tennessee, 1957-1958, Vol. LXII, No. 13, U. S. Weather Bureau (Washington: Government Printing Office, 1957-1958), pp. 183-185.

⁶Ibid., p. 182.

⁷U. S. Department of Agriculture, Climate and Man: 1941 Yearbook of Agriculture (Washington: Government Printing Office, 1941), p. 1119.

⁸Rand McNally and Co., Rand McNally Commercial Atlas and Marketing Guide, (nintieeth edition; New York: Rand McNally and Co., 1959), p. 411.

⁹U. S. Bureau of the Census, County and City Data Book, loc. cit.

over 44 per cent live in rural areas.¹⁰

The average number of farms growing cotton in Madison County, 1954-1958, was 2,907 (Table XII). From 1954 to 1958 there was an average of 27,493 bales of cotton ginned per year (Table XIII). During this period, over 87 per cent of the estimated cotton acreage grown in this county was devoted to two varieties: Deltapine and Empire (Table XIV).

II. FOREIGN MATTER IN TOTAL COTTON

Average and range of foreign matter by years. In examining the variation of foreign matter in total cotton by years at the Bemis gin, it was found that the amount varied widely among individual bales but very little by years (Figure 9). In 1954 the proportion of foreign matter in total cotton averaged 9.7 per cent with a range among individual bales from 0 to 68.3 per cent. In 1955 it averaged 11.7 per cent with a range among bales of 0.2 to 60.1 per cent. In 1956 it decreased to an average of 7.8 per cent with a range among bales of 0 to 57.6 per cent. In 1957 there was an increase to 11.9 per cent with a range among bales from 0 to 47.9 per cent, giving 1957 the highest average per cent but the smallest range until then. In 1958 the average per cent of foreign matter decreased to 7.9 per cent, and the range went from 0 to 44.5 per cent.

When a trend line was constructed representing the per cent of foreign matter for the five years by the least squares method, it was

¹⁰Rand McNally and Company, loc. cit.

TABLE XII

NUMBER OF FARMS GROWING COTTON AND MEASURED COTTON ACREAGE,
BY YEARS, MADISON COUNTY, TENNESSEE, 1954-1958^a

Year	Farms Growing Cotton	Measured Cotton Acreage Less Acreage Destroyed to Comply with Allotments
	No.	Acres
1954	2,998	36,829
1955	2,965	32,654
1956	2,956	31,414
1957	2,802	28,955
1958	2,813	26,417
5-Year Average	2,907	31,254

^aSource: Tennessee ASC Committee, Tennessee Annual Statistical Report ASC Programs, 1954, 1955, 1956, 1957, and 1958, U. S. Department of Agriculture (Washington: Government Printing Office, 1954-1958); 1954, pp. 57-58; 1955, pp. 58-59; 1956, pp. 58-59; 1957, pp. 48-49; 1958, pp. 47-48.

TABLE XIII

AMOUNT OF COTTON GINNED, BY GINNING PERIODS,
MADISON COUNTY, TENNESSEE, 1954-1958^a

Ginning Period	1954	1955	1956	1957	1958
Bales of Cotton Ginned					
Sept. 1-15	3,682	1,276	7,495	1,118	849
Sept. 16-30	8,257	3,530	8,814	3,259	3,841
Oct. 1-17	6,269	7,169	6,850	7,372	9,529
Oct. 18-31	3,788	6,402	2,667	3,491	6,111
Nov. 1-13	3,138	5,904	1,033	3,295	3,104
Nov. 14-30	1,137	3,134	487	2,152	1,442
Dec. 1-12	118	1,952	203	1,495	615
Dec. 13-Mar. 20	152	3,361	155	1,902	918
Total	26,541	32,728	27,704	24,084	26,409

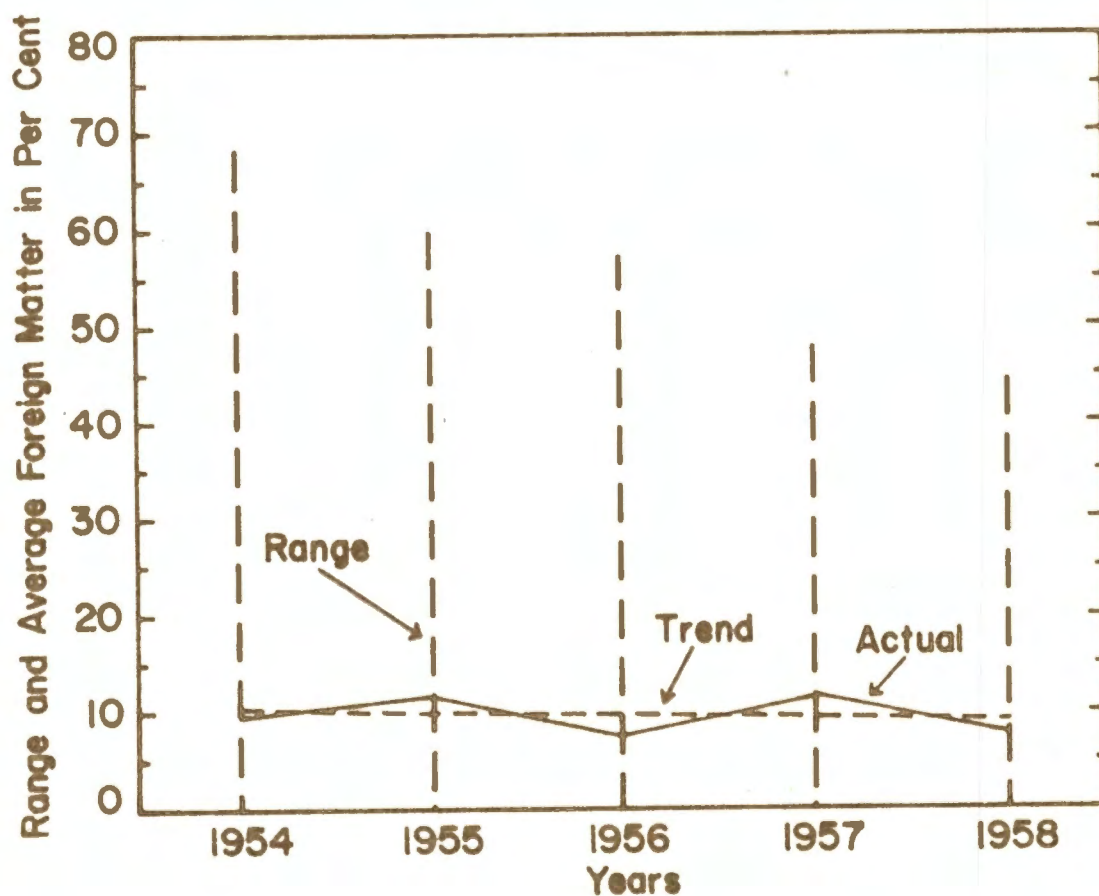
^aSource: U. S. Bureau of the Census, Cotton Production in the United States, 1954, 1955, 1956, 1957, and 1958 (Washington: Government Printing Office, 1955-1959); 1954, p. 33; 1955, p. 33; 1956, p. 33; 1957, p. 34; 1958, p. 35.

TABLE XIV

ESTIMATED PERCENTAGE OF COTTON ACREAGE PLANTED TO SPECIFIED VARIETIES,
MADISON COUNTY, TENNESSEE, 1954-1958^a

Year	Deltapine	Empire	Fox	Hibred	Stone- ville	Ooker 100W	Other	Total
Estimated Percentage of Varieties Grown								
1954	65	18	12	0	1	0	4	100
1955	72	19	5	1	1	0	2	100
1956	64	22	7	0	2	1	4	100
1957	67	19	8	2	0	0	4	100
1958	63	29	1	1	1	0	5	100
5-Year Average	66.2	21.4	6.6	0.8	0.8	0.2	3.8	100

^aSource: U. S. Department of Agriculture, Cotton Varieties Planted, 1954, 1955, 1956, 1957, and 1958 (Memphis: Agricultural Marketing Service, Cotton Division, 1954-1958), pp. 14-15.



Trend: $Y_c = 9.8 - .3X$; Origin, 1956.

FIGURE 9

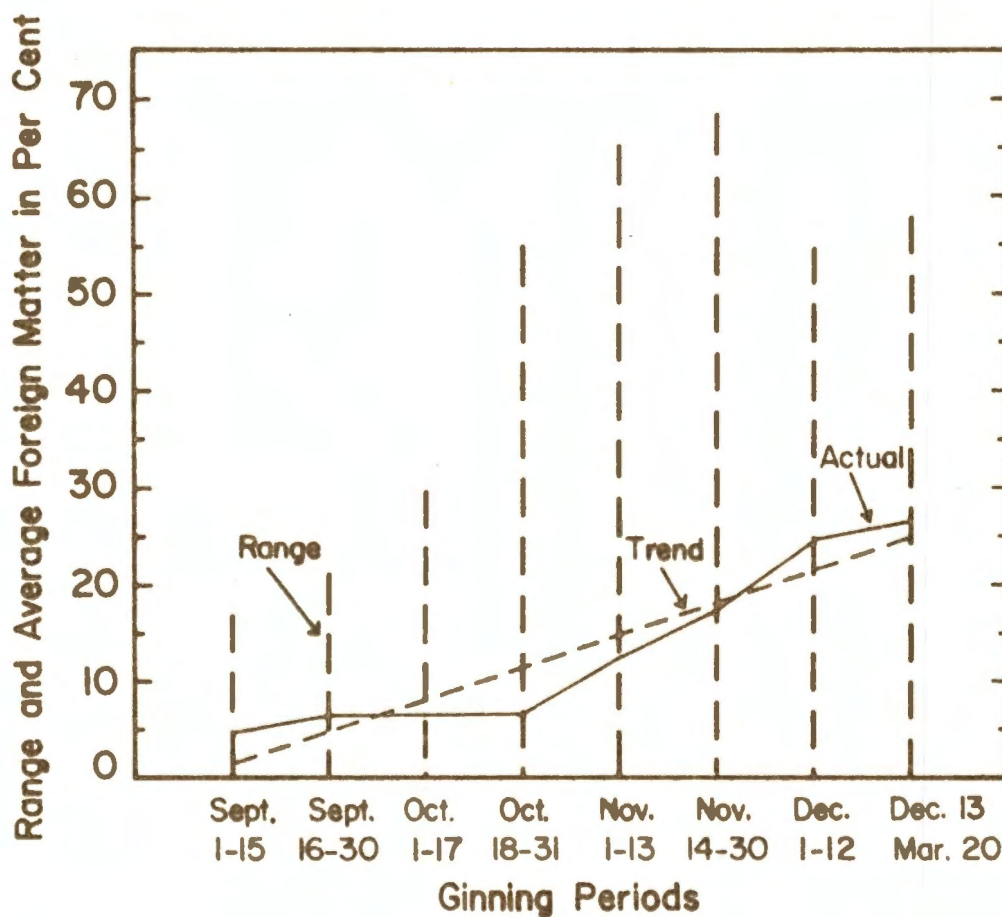
RANGE AND AVERAGE PER CENT OF FOREIGN MATTER IN TOTAL COTTON,
BY YEARS, BEMIS GIN, MADISON COUNTY, TENNESSEE, 1954-1958
(BASED ON DATA IN APPENDIX G)

found to have a slight negative slope.

Five-year averages of foreign matter by ginning periods. An examination was made of the variation of the amount of foreign matter in the seed cotton by ginning periods for five years, 1954-1958, at Bemis gin.¹¹ It was found that the per cent of foreign matter varied considerably among some ginning periods (Figure 10). For example, during the September 1-15 ginning period, the proportion of foreign matter averaged 4.8 per cent with a range of 0 to 16.8 per cent; and during the December 13-March 20 ginning period, the average was 26.5 per cent, with a range of 0 to 58 per cent. This was a difference of 21.7 per cent in foreign matter content from beginning to end of ginning season. The widest range occurred during the November 14-30 ginning period, which was 0.2 to 68.3 per cent. When the data for the entire ginning season was examined by each period, it was found that as the season progressed, the average per cent of foreign matter in the total cotton in each period either stayed the same or increased over the previous period.

When a trend was constructed representing the foreign matter for the entire ginning season for the five years studied, it was found to be positively sloped. That is, if the origin for the trend line was taken to be midway between the ginning periods of October 18-31 and November 1-13, it was found that for each one-half ginning period that

¹¹The average per cent of foreign matter for each period was obtained by dividing the total pounds of foreign matter for five years for this period by the total pounds of seed cotton for five years. The average per cent foreign matter for each year is obtained by dividing total pounds foreign matter for the year by total pounds of total, picked, or snapped cotton for the year. Ranges are for individual bales.



Trend: $Y_c = 13.1 + 1.7X$; Origin, Oct. 18-31 to Nov. 1-13;
 X units, $\frac{1}{2}$ ginning period.

FIGURE 10

FIVE-YEAR RANGE AND AVERAGE PER CENT OF FOREIGN MATTER
 IN TOTAL COTTON, BY GINNING PERIODS, BEMIS GIN,
 MADISON COUNTY, TENNESSEE, 1954-1958
 (BASED ON DATA IN APPENDIX 9)

was moved along the trend line toward the end of the season from the origin, the average per cent of foreign matter in the cotton increased by 1.7 per cent. However, none of the true averages for the ginning periods fell exactly on the calculated trend line. The actual averages varied from 3.5 per cent above the trend line to 4.8 per cent below. From the data presented here, it appears that the per cent of foreign matter in cotton from one ginning period to the next does not increase at a constant rate, decreasing rate or increasing rate throughout the entire season, but varied considerably.

Foreign matter within each season by ginning periods. When an examination was made of the data relating to the per cent of foreign matter by ginning periods within each of the years studied, it was found that there was considerable variation among ginning periods for each of the years (Table IV). For example, during the September 1-15 period of 1954, the amount of foreign matter averaged 4.3 per cent with a range of 0 to 16.8 per cent; and during the December 13-March 20 ginning period, the average was 31.6 per cent with a range of 6.7 to 45.7 per cent. This was a difference of 27.3 per cent from beginning to end of the season. When the data for the entire season of 1954 was examined by each period, it was found that as the season progressed, the average per cent of foreign matter in the cotton increased, but at a variable rate.

In 1955 the foreign matter content varied from an average of 4.4 per cent in the September 1-15 period to 28.2 per cent in the December 13-March 20 period. This was a variation of 23.8 per cent from beginning to end of season. The proportion of foreign matter in the cotton increased

TABLE XV

VARIATION IN RANGE AND AVERAGE PER CENT OF FOREIGN MATTER IN TOTAL COTTON, BY GINNING PERIODS,
WITHIN EACH SEASON, BEMIS GIN, MADISON COUNTY, TENNESSEE, 1954-1958^a

Crop Year	Bales and Foreign Matter	September		October		November		December-March 20	
		1-15	16-30	1-17	18-31	1-13	14-30	Dec. 1-12	Dec.-Mar. 13-20
1954	No. Bales	272	536	374	225	205	74	20	13
	Avg. %	4.3	4.8	5.9	11.3	22.9	23.8	21.9	31.6
	Range	0.0-16.8	0.2-21.1	0.2-29.4	0.2-55.2	0.7-65.3	0.5-68.3	0.9-37.8	6.7-45.7
1955	No. Bales	64	155	371	317	277	116	85	196
	Avg. %	4.4	4.5	6.3	5.5	8.6	16.4	28.7	28.2
	Range	1.7-8.9	0.2-8.4	0.9-22.3	0.7-28.3	0.7-38.7	0.7-60.1	4.7-54.8	2.1-58.0
1956	No. Bales	391	436	417	180	78	30	77	31
	Avg. %	4.7	4.2	6.6	5.9	7.0	16.1	29.3	31.9
	Range	0.0-12.2	0.0-10.3	0.1-17.9	0.1-31.5	0.4-27.1	0.2-45.7	1.5-51.7	0.2-57.6
1957	No. Bales	65	181	506	188	189	105	62	229
	Avg. %	4.8	9.1	6.4	7.0	11.1	16.9	16.8	26.1
	Range	3.3-12.4	1.6-17.7	0.0-18.7	2.0-35.9	0.4-41.2	1.7-39.1	4.7-38.5	2.1-47.9
1958	No. Bales	69	406	1,001	571	218	99	33	88
	Avg. %	7.4	9.6	6.1	5.7	9.2	12.7	18.7	20.5
	Range	0.9-12.7	0.0-18.5	0.0-29.2	0.0-39.2	0.1-37.8	1.1-40.0	1.5-42.1	0.0-44.5

^aSource: Appendix G.

at a variable rate as the season progressed.

In 1956 the foreign matter content varied from an average of 4.2 per cent in the September 16-30 period to 31.9 per cent in the December 13-March 20 period. This was a variation of 27.7 per cent. The foreign matter content from period to period changed at a variable rate, but the trend was upward as the season progressed. The proportion of foreign matter more than doubled between some periods.

In 1957 the foreign matter content varied from an average of 4.8 per cent in the September 1-15 ginning period to 26.1 per cent in the December 13-March 20 period. This was a range of 21.3 per cent for the season. The trend in foreign matter content was upward as the season progressed, but in some periods there was a decrease over the previous period. For example, in the October 1-17 ginning period there was a 30 per cent decrease from the September 16-30 period.

In 1958 the foreign matter content varied from an average of 5.7 per cent during the October 18-31 period to 20.5 per cent during December 13-March 20 ginning period. This was a range of 14.8 per cent. In this year, as in the other four studied, it was found that the foreign matter content from period to period changed at a variable rate. When all the ginning periods of 1958 were considered together, the trend was upward from beginning to end of the ginning season.

When an analysis of variance was made of the variation of foreign matter content in cotton among ginning periods for the five years studied, and of the variation among the total foreign matter content for each year, it was found that the averages of the foreign matter content of

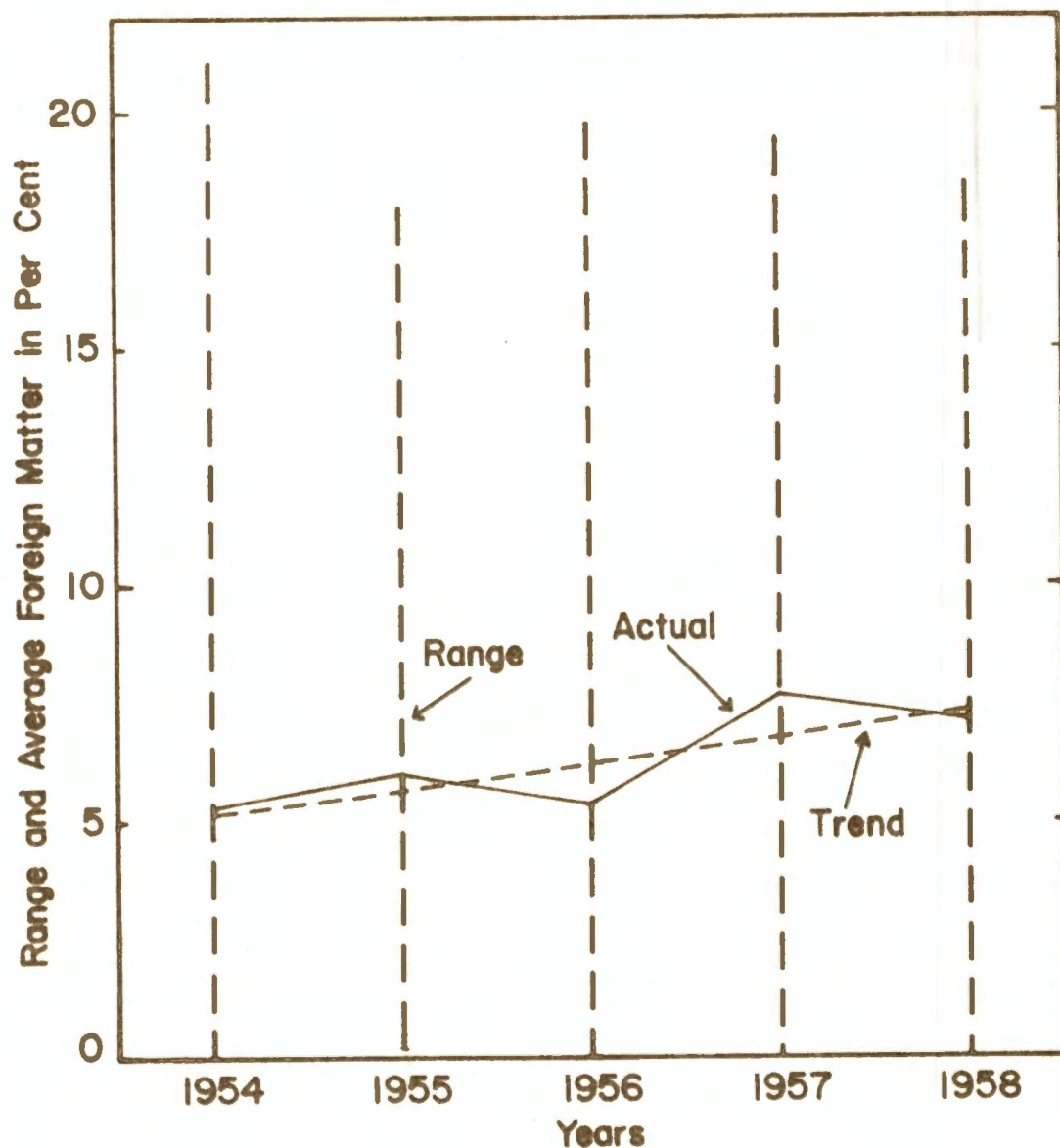
the ginning periods were significantly different, but the averages for each of the different years were not significantly different at the 95 per cent level of probability.¹²

III. FOREIGN MATTER IN PICKED COTTON

Average and range of foreign matter by years. The discussion in this chapter so far has been devoted to the foreign matter content of total seed cotton. When the data were classified into picked cotton by years, 1954-1958, at the Bemis gin, it was found that the foreign matter content varied considerably during some years (Figure 11). The average per cent of foreign matter in the picked cotton remained about the same for the years 1954, 1955, and 1956, but in 1957 there was a considerable increase. For example, the per cent of foreign matter averaged 5.4 in 1956 and 7.7 in 1957, an increase of 42 per cent over 1956. In 1958 there was an average of 7.1 per cent, which was .6 per cent less than in 1957 but still more than in any one of the earlier years. When a trend line was constructed for the entire ginning season for the five years studied, it was found to be positively sloped; that is, the per cent of foreign

¹²The hypothesis of no difference among means of different years is rejected if $F_{.95}(4,28) \geq 2.69$. The F ratio was equal to $23.1 \div 14.8 = 1.6$. So the hypothesis of no difference among means of different years was accepted, and it was concluded that there is evidence to believe that they are not significantly different.

The hypothesis of no difference among means of different ginning periods is rejected if $F_{.95}(7,28) \geq 2.33$. The F ratio was equal to $372.3 \div 14.8 = 25.2$. So the hypothesis of no difference among means of different ginning periods was rejected, and it was concluded that there is evidence to believe that they are significantly different.



Trend: $Y_c = 6.3 + .6X$; Origin, 1956.

FIGURE 11

RANGE AND AVERAGE PER CENT OF FOREIGN MATTER IN PICKED COTTON,
BY YEARS, BEMIS GIN, MADISON COUNTY, TENNESSEE, 1954-1958
(BASED ON DATA IN APPENDIX H)

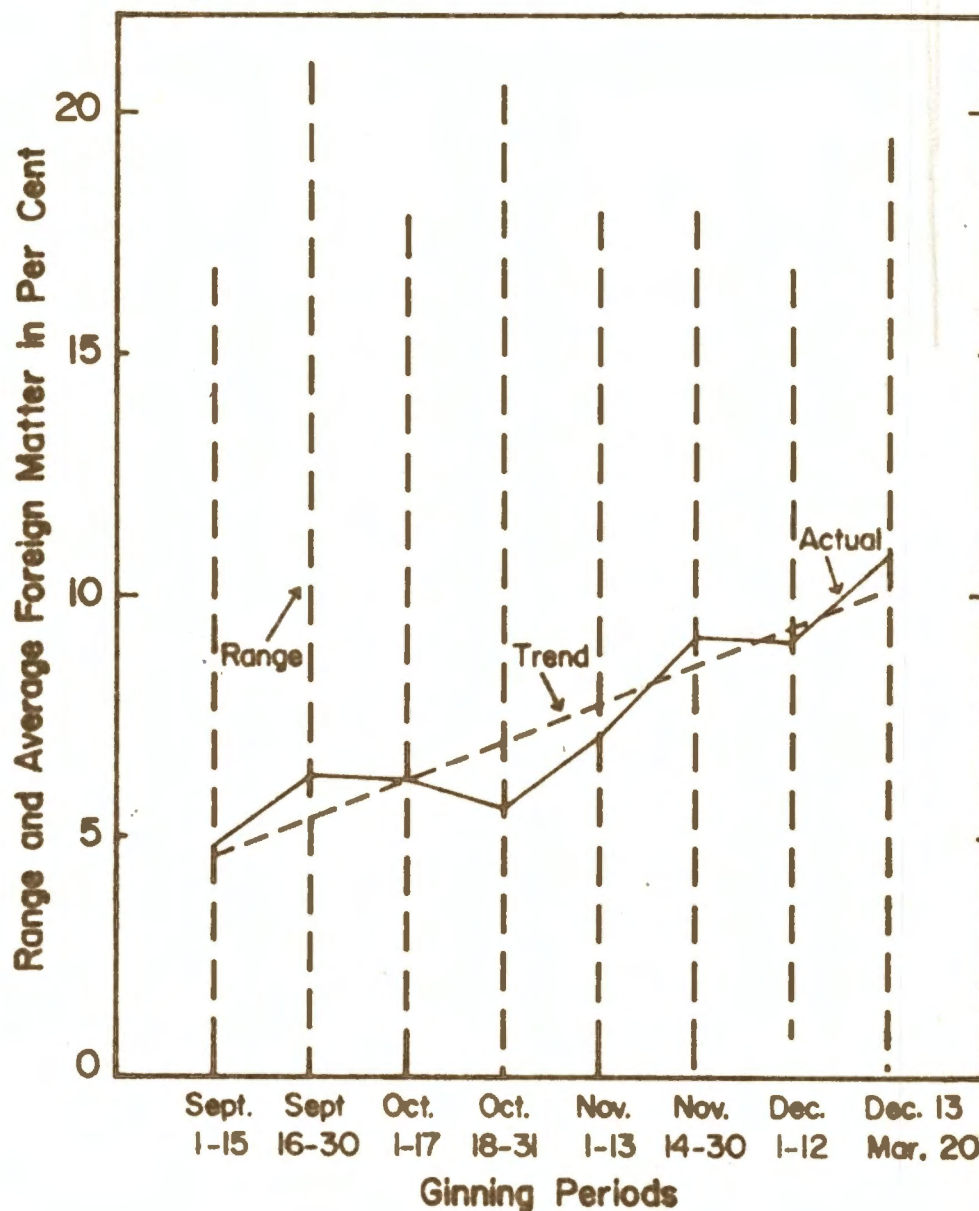
matter tended to increase as the season progressed.

Five-year averages of foreign matter by ginning periods. A larger variation was found when the per cent of foreign matter in picked cotton was broken down into ginning periods for the five years studied (Figure 12). For example, during the September 1-15 ginning period, the proportion of foreign matter averaged 4.8 per cent with a range of 0 to 16.8 per cent; and during the December 13-March 20 ginning period, the average was 10.9 per cent, with a range of 0 to 19.5 per cent. This was an increase of 6.1 per cent during the whole season. The foreign matter content among ginning periods varied throughout the season.

When a trend line was fitted to the data by the least squares method, the trend was upward. None of the actual averages fell exactly on the trend line. The averages ranged from 0.9 per cent above the trend line to 1.4 per cent below.

Foreign matter within each season by ginning periods. A tabulation was made of the variation in the average per cent and range of foreign matter in picked cotton among ginning periods of the same year and among the same ginning periods of different years at the Bemis gin in Madison County, Tennessee, 1954-1958 (Table XVI). This examination was made to determine how foreign matter varied with method of harvest. When the data for the five years were analysed, it was found that there was a considerable variation in foreign matter in picked cotton during ginning periods of the same year but less than was found in total cotton.

In 1954 the average foreign matter content ranged from 4.3 per cent in the September 1-15 period to 8.7 per cent in the December 13-



Trend: $Y_c = 7.4 + .4X$; Origin, Oct. 18-31 to Nov. 1-13;
 X units, $\frac{1}{2}$ ginning period.

FIGURE 12

FIVE-YEAR RANGE AND AVERAGE PER CENT OF FOREIGN MATTER
 IN PICKED COTTON, BY GINNING PERIODS, BEMIS GIN,
 MADISON COUNTY, TENNESSEE, 1954-1958
 (BASED ON DATA IN APPENDIX H)

TABLE IVI

VARIATION IN RANGE AND AVERAGE PER CENT OF FOREIGN MATTER IN PICKED COTTON, BY GINNING PERIODS,
WITHIN EACH SEASON, BEHIS GIN, MADISON COUNTY, TENNESSEE, 1954-1958^a

Crop Year	Bales and Foreign Matter	September		October		November		December-March 30	
		1-15	16-30	1-17	18-31	1-13	14-30	Dec. 1-12	Dec.-Mar. 13 30
1954	No. Bales	272	536	370	193	102	37	11	5
	Avg. %	4.3	4.8	5.6	6.1	6.5	7.6	7.2	8.7
	Range	0.0-16.8	0.2-21.1	0.2-16.3	0.2-20.6	0.7-17.9	0.5-13.1	0.9-14.7	6.7-12.6
1955	No. Bales	64	155	370	306	259	87	34	79
	Avg. %	4.4	4.5	6.3	5.3	6.1	7.0	9.2	9.3
	Range	1.7-8.9	0.2-8.4	0.9-16.3	0.7-14.5	0.7-16.2	0.7-18.0	4.7-16.8	2.1-17.1
1956	No. Bales	391	436	417	177	75	24	33	13
	Avg. %	4.7	4.2	6.6	5.3	6.1	8.0	8.4	12.2
	Range	0.0-12.2	0.0-10.3	0.1-17.9	0.1-19.8	0.4-11.2	0.2-8.8	1.5-10.8	0.2-18.0
1957	No. Bales	65	181	505	187	170	75	48	100
	Avg. %	4.8	9.1	6.4	6.9	7.7	9.8	11.1	12.0
	Range	3.3-12.4	1.6-17.7	0.0-15.6	2.0-11.3	0.4-14.5	1.7-16.3	4.7-16.8	2.1-19.5
1958	No. Bales	69	406	991	567	212	94	24	60
	Avg. %	7.4	9.6	6.1	5.5	8.5	11.5	7.0	11.1
	Range	0.9-12.7	0.0-18.5	0.0-15.6	0.0-12.5	0.1-12.5	1.1-12.5	1.5-10.1	0.0-17.9

^aSource: Appendix H.

March 20 period. It was found that as the season progressed, the average per cent of foreign matter in the cotton in each period increased over the previous one. The ranges in foreign matter content of the individual bales varied from period to period.

In 1955 the foreign matter content varied from 4.4 per cent in the September 1-15 period to 9.3 per cent in the December 13-March 20 period, an increase of 4.9 per cent. The trend throughout the season was upward. The greatest change between any two periods of the season was between the November 14-30 and December 1-12 periods, when an increase of 30 per cent was reported. The trend for the season was upward, but the foreign matter content for each ginning period changed at a variable rate.

In 1956 the foreign matter content varied from 4.2 per cent in the September 16-30 ginning period to 12.2 per cent in the December 13-March 20 period. The range for the individual bales varied from period to period. The trend was upward as the season progressed. There was considerable variation between some periods. For example, the proportion of foreign matter in the December 13-March 20 ginning period increased 45 per cent over that for the December 1-12 ginning period.

In 1957 the foreign matter content varied from 4.8 per cent in the September 1-15 period to 12 per cent in the December 13-March 20 ginning period. This represented a range of 7.2 per cent from beginning to end of season. The trend for the year was upward.

In 1958 the foreign matter content varied from 5.5 per cent in the October 18-31 period to 11.5 per cent in the November 14-30 period, an increase of 6 per cent. The trend for this season was upward as the

season progressed, but there was a considerable variation among ginning periods in average foreign matter content. For example, there was a decrease of 39 per cent from the November 14-30 period to the December 1-12 period, and then an increase of 58 per cent to the December 13-March 20 period.

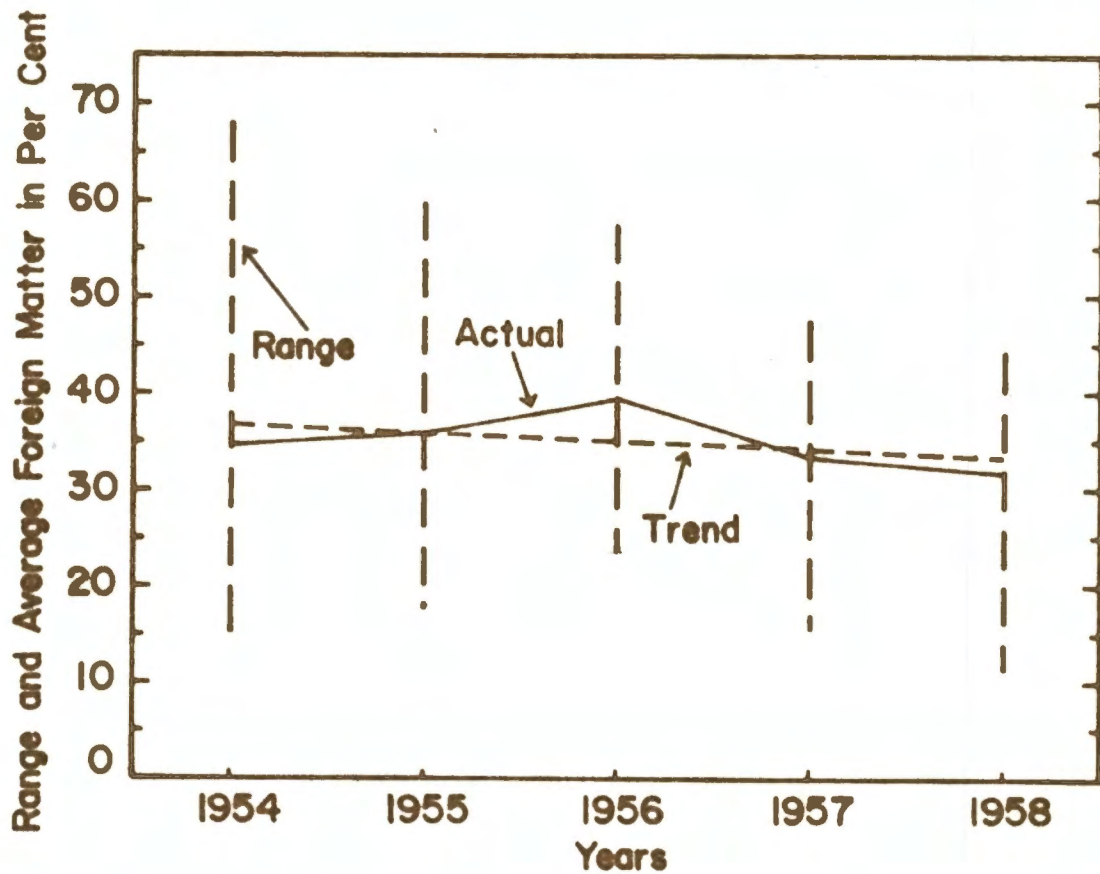
When an analysis of variance was made of the variation of average per cent of foreign matter in picked cotton among ginning periods for the five-year period studied and of the variation among the years, it was found that the averages of the foreign matter content of the ginning periods in the same year and for each of the different years were significantly different at the 95 per cent level of probability.¹³

IV. FOREIGN MATTER IN SNAPPED COTTON

Average and range of foreign matter by years. When an examination was made of the data relating to snapped cotton by years, it was found that the per cent of foreign matter was much higher than in picked cotton (Figure 13). The average proportion in snapped cotton varied from 39.4 per cent in 1956 to 31.5 per cent in 1958. The range among

¹³The hypothesis of no difference among means of different years is rejected if $F_{.95}(4,28) \geq 2.69$. The F ratio was equal to $8.2 \div 1.58 = 5.2$. So the hypothesis of no difference among means of different years was rejected, and it was concluded that there is evidence to believe that they are significantly different.

The hypothesis of no difference among means of different ginning periods is rejected if $F_{.95}(7,28) \geq 2.33$. The F ratio was equal to $17.2 \div 1.6 = 10.9$. So the hypothesis of no difference among means of different ginning periods was rejected, and it was concluded that there is evidence to believe that they are significantly different.



Trend: $Y_c = 35 - .8X$; Origin, 1956.

FIGURE 13

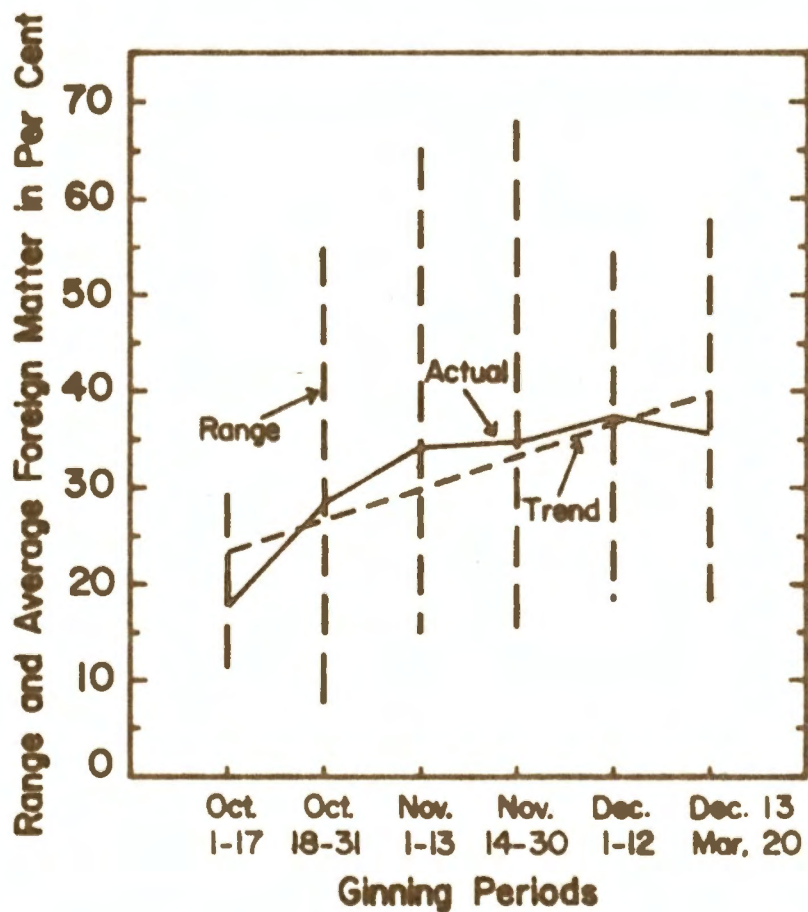
RANGE AND AVERAGE PER CENT OF FOREIGN MATTER IN SNAPPED COTTON,
BY YEARS, BEMIS GIN, MADISON COUNTY, TENNESSEE, 1954-1958
(BASED ON DATA IN APPENDIX I)

the individual bales also decreased from 1954 to 1958. For example, in 1954 the range was 15.2 to 68.3 and in 1958 it had narrowed to 11.4 to 44.5 per cent. When a trend was constructed for the foreign matter, it was found that over the five-year period it was slightly downward.

Five-year averages of foreign matter by ginning periods. When the data relating to foreign matter of snapped cotton was examined by ginning periods, it was found that there was considerable variation (Figure 14). For example, during the October 1-17 ginning period, the proportion of foreign matter averaged 17.9 per cent with a range of 11.4 per cent to 29.4 per cent; and during the December 1-12 ginning period, the average was 37.4 per cent with a range of 18.6 to 54.8 per cent, an increase of 19.5 per cent. When the entire ginning season was examined and a trend line was constructed for the five years studied, it was found to be upward as the season progressed. However, none of the actual averages fell exactly on the calculated trend line. The averages ranged from 5.2 per cent below the trend line to 4.5 per cent above.

From the data presented here it appears that the per cent of foreign matter in snapped cotton varies considerably from one ginning period to the next and tends to increase as the ginning season advances (Figure 14).

Foreign matter within each season by ginning periods. A tabulation was made of the variation in the average per cent and range of foreign matter in snapped cotton among ginning periods of the same year and among the same ginning periods of different years at the Bemis gin in Madison County, Tennessee, 1954-1958 (Table XVII). When the ginning



Trend: $Y_c = 31.5 + 1.7X$; Origin, Nov. 1-13 to Nov. 14-30; X units, $\frac{1}{2}$ ginning period.

FIGURE 14

FIVE-YEAR RANGE AND AVERAGE PER CENT OF FOREIGN MATTER
IN SNAPPED COTTON, BY GINNING PERIODS, BEMIS GIN
MADISON COUNTY, TENNESSEE, 1954-1958
(BASED ON DATA IN APPENDIX I)

TABLE XVII

VARIATION IN RANGE AND AVERAGE PER CENT OF FOREIGN MATTER IN SNAPPED COTTON, BY GINNING PERIODS,
WITHIN EACH SEASON, BENIS, GIN, MADISON COUNTY, TENNESSEE, 1954-1958^a

Crop Year	Gin Matter	September			October			November			December-March 20		
		1-15	16-30	1-17	18-31	1-13	14-30	1-12	13-20	21-28	29-31	1-12	13-20
1954	No. Bales	b	-	4	32	103	37	9	8				
	Avg. %	-	-	25.5	32.8	34.7	35.7	33.8	41.4				
	Range	-	-	22.7-29.4	19.7-55.2	15.2-65.3	15.3-60.3	24.0-37.8	37.4-45.7				
1955	No. Bales	-	-	1	11	18	29	51	117				
	Avg. %	-	-	22.3	10.6	34.8	36.6	37.2	36.8				
	Range	-	-	0	7.9-28.3	27.8-38.7	17.8-60.1	29.2-54.8	18.6-58.0				
1956	No. Bales	-	-	-	3	3	6	44	18				
	Avg. %	-	-	-	31.5	25.6	38.2	39.9	41.4				
	Range	-	-	-	0	23.7-27.1	33.1-45.7	31.3-51.7	27.5-57.6				
1957	No. Bales	-	-	1	1	19	30	14	129				
	Avg. %	-	-	18.7	35.9	33.5	31.3	31.5	33.9				
	Range	-	-	0	0	26.8-41.2	15.3-39.1	18.6-38.5	18.9-47.9				
1958	No. Bales	-	-	10	4	6	5	9	28				
	Avg. %	-	-	13.9	25.5	30.8	30.3	38.3	35.1				
	Range	-	-	11.4-29.2	20.0-39.2	23.6-37.8	21.6-40.0	31.0-42.1	31.7-44.5				

^aSource: Appendix I.

^bNo data available at Benis gin during these periods.

periods for each year were examined, it was found that, in general, as the season progressed, the average per cent of foreign matter content increased and was much higher in snapped cotton than it had been in picked cotton. It also changed at a variable rate from one ginning period to another for each year.

When an analysis of variance was made, it was found that the differences in the averages in the foreign matter content among ginning periods were significantly different at the 95 per cent level of probability.¹⁴

It was also found that the differences among the means for each of the different years were not significantly different at the 95 per cent level of probability.¹⁵

¹⁴The hypothesis of no difference among means of different ginning periods is rejected if $F_{.95}(4,20) \geq 2.87$. The F ratio was equal to $191.6 \div 25.5 = 7.5$. So the hypothesis of no difference among means of different ginning periods was rejected, and it was concluded that there is evidence to believe that they are significantly different.

¹⁵The hypothesis of no difference among means of different years is rejected if $F_{.95}(5,20) \geq 2.71$. The F ratio was equal to $42.7 \div 25.5 = 1.7$. So the hypothesis of no difference among means of different years is accepted, and it was concluded that there is evidence to believe that they are not significantly different.

CHAPTER V

COMPARISON OF FOREIGN MATTER CONTENTS IN SEED COTTON AT TWO GINS IN TENNESSEE

In this chapter a comparison is made of the foreign matter content in the seed cotton of the two gins studied in chapters III and IV. The primary purpose of this comparison is to determine if the foreign matter content of the cotton varies from gin to gin in different geographic areas.

I. FOREIGN MATTER IN TOTAL COTTON

Average by years. In examining the data relating to the foreign matter content of the total cotton at the two gins studied, it was found that the five-year average percentages of 9.6 and 9.0 were not significantly different (Table XVIII).¹ In making a comparison of the average per cent foreign matter content by individual years it was found that the foreign matter content was significantly different between the two gins for each of the years except 1956. In the other four years the difference between the average foreign matter content at the two gins ranged from 2.1 to 4.6 per cent, with the greatest difference being in 1957.

Five-year average by ginning periods. In examining the data on proportions of foreign matter in total cotton for all of the five years

¹In tables XVII to XIV the *t* test was used to test the difference between means. The tests were all made at the 95 per cent level.

TABLE XVIII

COMPARISON OF THE AVERAGE PER CENT OF FOREIGN MATTER IN TOTAL COTTON,
BY YEARS, TWO GINS, TENNESSEE, 1954-1958^a

Year	Bemis Gin	Towry Gin	Two Gins ^b
Average Per Cent Foreign Matter			
1954	9.7	7.6	9.0
1955	11.7	7.5	10.7
1956	7.8	6.6	7.4
1957	11.9	16.5	12.8
1958	7.9	11.4	8.3
5-Year	9.6	9.0	9.5

^aSource: Appendices D and G.

^bThe average per cent of foreign matter for the two gins was obtained by dividing the total pounds of foreign matter at both gins by total pounds of seed cotton at both of the gins.

together for each ginning period at the two gins it was found that the averages of each ginning period were significantly different for all periods except November 1-13 and December 1-12 periods (Table XIX). The greatest difference between the averages of the gins within each ginning period for the five years was 3.9 per cent for the December 13-March 20 period.

Average within each season by ginning periods. In studying the data relating to the foreign matter content between the two gins by ginning periods within each season, it was found that the average of the foreign matter content for many of the periods were significantly different (Table XX). For example, in 1954 there was a significant difference between the averages of all the periods except those of September 16-30 and November 1-13. In 1955 the averages of only two ginning periods were significantly different, these being the September 16-30 and October 1-17 periods. In 1956 it was found that the difference in foreign matter content between the two gins was significantly different in only two periods, the September 1-15 and October 1-17. In 1957 the averages for every ginning period except one were found to be significantly different, the September 1-15 period being the exception. In 1958 the averages in only two periods were significantly different, the October 1-17 and November 14-30.

II. FOREIGN MATTER IN PICKED COTTON

Average by years. A statistical analysis of the difference in the foreign matter content of the picked cotton at the two gins revealed

TABLE XIX

COMPARISON OF THE FIVE-YEAR AVERAGE PER CENT OF FOREIGN MATTER
IN TOTAL COTTON, BY GINNING PERIODS, TWO GINS,
TENNESSEE, 1954-1958^a

Ginning Period	Bemis Gin	Towry Gin	Two Gins
Average Per Cent Foreign Matter			
Sept. 1-15	4.8	3.3	4.6
Sept. 16-30	6.3	4.3	5.7
Oct. 1-17	6.3	7.7	6.6
Oct. 18-31	6.7	8.7	7.1
Nov. 1-13	12.5	13.4	12.7
Nov. 14-30	17.1	16.0	16.8
Dec. 1-12	24.9	24.8	24.9
Dec. 13-Mar. 20	26.5	30.4	26.9
5-Year	9.6	9.0	9.5

^aSource: Appendices D and G.

TABLE XI

COMPARISON OF THE AVERAGE PER CENT OF FOREIGN MATTER IN TOTAL COTTON,
BY GINNING PERIODS, WITHIN EACH SEASON, TWO GINS,
TENNESSEE, 1954-1958^a

Year	Gin	Sept. 1-15	Sept. 16-30	Oct. 1-17	Oct. 18-31	Nov. 1-13	Nov. 14-30	Dec. 1-12	Dec. 13- Mar. 20
Average Per Cent Foreign Matter									
1954	Bemis	4.3	4.8	5.9	11.3	22.9	23.8	21.9	31.6
	Towry	2.9	4.2	9.2	15.5	20.8	26.5	8.2	- ^b
	2 Gins	3.9	4.6	7.2	12.6	22.7	24.0	21.4	31.6
1955	Bemis	4.4	4.5	6.3	5.5	8.6	16.4	28.7	28.2
	Towry	4.2	3.4	4.2	5.5	10.5	15.8	25.6	31.8
	2 Gins	4.4	4.0	5.7	5.5	8.9	16.2	28.5	28.5
1956	Bemis	4.7	4.2	6.6	5.9	7.0	16.1	29.3	31.9
	Towry	1.7	4.4	4.8	4.5	6.7	12.8	28.4	-
	2 Gins	4.7	4.3	6.0	5.4	6.8	14.1	29.1	31.9
1957	Bemis	4.8	9.1	6.4	7.0	11.1	16.9	16.8	26.1
	Towry	5.1	5.8	15.9	12.1	22.8	25.2	28.1	38.1
	2 Gins	4.9	8.2	7.9	8.2	14.2	19.0	22.4	26.7
1958	Bemis	7.4	9.6	6.1	5.7	9.2	12.7	18.7	20.5
	Towry	-	9.5	7.5	5.9	9.3	8.3	20.7	25.1
	2 Gins	7.4	9.6	6.2	5.9	9.2	11.5	19.7	21.5

^aSource: Appendices D and G.

^bNo data available during these periods.

that the five-year average percentages of 6.4 and 5.5 were significantly different (Table XXI). When the data for each year were examined, it was found that the percentages for each of the five years except 1954 and 1958 were significantly different.

Five-year average by ginning periods. The data on proportions of foreign matter in picked cotton for all of the five years for each ginning period at the two gins showed considerable variation (Table XXII). When the t test was applied to the data, it was found that in five of these periods there was a significant difference between the averages of the two gins. These periods were September 1-15, September 16-30, October 18-31, November 14-30, and December 1-12. The greatest difference between the means of the foreign matter content of the gins within each ginning period occurred in the December 1-12 ginning period, a difference of 2.4 per cent.

Average within each season by ginning periods. Examination was made of the data relating to the differences in the foreign matter content between the two gins by ginning periods within each season. It was found that during some years no significant differences existed between the average percentages of the two gins; while during other years, many of the averages showed a significant difference (Table XXIII). In 1954 there was a significant difference between the averages in each of the first two ginning periods, September 1-15 and September 16-30. In 1955 there was a significant difference in the averages of three periods, September 16-30, October 1-17, and December 1-12. In 1956 it was found that the averages in the September 1-15, October 1-17, October 18-31, and

TABLE XII

COMPARISON OF THE AVERAGE PER CENT OF FOREIGN MATTER IN PICKED COTTON,
BY YEARS, TWO GINS, TENNESSEE, 1954-1958^a

Year	Bemis Gin	Towry Gin	Two Gins
	Average Per Cent Foreign Matter		
1954	5.3	4.9	5.2
1955	6.0	4.7	5.7
1956	5.4	4.8	5.2
1957	7.7	9.3	8.0
1958	7.1	6.5	7.1
5-Year	6.4	5.5	6.2

^aSource: Appendices E and H.

TABLE XXII

COMPARISON OF THE FIVE-YEAR AVERAGE PER CENT OF FOREIGN MATTER
IN PICKED COTTON, BY GINNING PERIODS, TWO GINS,
TENNESSEE, 1954-1958^a

Ginning Period	Bemis Gin	Towry Gin	Two Gins
Average Per Cent Foreign Matter			
Sept. 1-15	4.8	3.3	4.6
Sept. 16-30	6.3	4.1	5.7
Oct. 1-17	6.2	6.7	6.3
Oct. 18-31	5.7	5.1	5.5
Nov. 1-13	7.1	6.6	7.0
Nov. 14-30	9.2	7.0	8.6
Dec. 1-12	9.1	6.7	8.7
Dec. 13-Mar. 20	10.9	9.4	10.8

^aSource: Appendices E and H.

TABLE XXIII

COMPARISON OF THE AVERAGE PER CENT OF FOREIGN MATTER IN PICKED COTTON,
BY GINNING PERIODS, WITHIN EACH SEASON, TWO GINS,
TENNESSEE, 1954-1958^a

Year	Gin	Sept. 1-15	Sept. 16-30	Oct. 1-17	Oct. 18-31	Nov. 1-13	Nov. 14-30	Dec. 1-12	Dec. 13- Mar. 20
Average Per Cent Foreign Matter									
1954	Bemis	4.3	4.8	5.6	6.1	6.5	7.6	7.2	8.7
	Towry	2.9	3.9	6.6	6.9	8.4	9.0	8.2	- ^b
	2 Gins	3.9	4.5	6.0	6.3	6.7	7.7	7.3	8.7
1955	Bemis	4.4	4.5	6.3	5.3	6.1	7.0	9.2	9.3
	Towry	4.2	3.4	4.2	4.6	7.1	7.4	4.0	10.8
	2 Gins	4.4	4.0	5.7	5.1	6.3	7.1	8.8	9.4
1956	Bemis	4.7	4.2	6.6	5.3	6.1	8.0	8.4	12.2
	Towry	1.7	4.4	4.8	4.0	5.9	6.9	6.1	-
	2 Gins	4.7	4.3	6.0	4.8	6.0	7.3	8.0	12.2
1957	Bemis	4.8	9.1	6.4	6.9	7.7	9.8	11.1	12.0
	Towry	5.1	5.8	15.3	5.8	8.0	7.5	7.0	-
	2 Gins	4.9	8.2	7.7	6.6	7.8	9.5	10.7	12.0
1958	Bemis	7.4	9.6	6.1	5.5	8.5	11.5	7.0	11.1
	Towry	-	9.5	6.3	5.9	5.5	6.4	7.1	8.9
	2 Gins	7.4	9.6	6.2	5.4	8.1	10.1	7.0	10.8

^aSources: Appendices E and H.

^bNo data available during these periods.

December 1-12 periods were significantly different. In 1957 the averages in all of the ginning periods were significantly different except the September 1-15 and November 1-13 periods. In 1958 there was only one period when there was a significant difference between the averages, that of November 14-30.

III. FOREIGN MATTER IN SNAPPED COTTON

Average by years. An analysis relating to the foreign matter content of the snapped cotton at two gins in Tennessee indicated that the five-year average percentages of 34.9 and 32.2 were significantly different (Table XXIV). When the data for each year were examined separately, it was found that the percentages were significantly different for the first three years. The differences between the two gins in each of the five years ranged from .3 in 1957 to 4.9 per cent in 1954.

Five-year average by ginning periods. In studying the data on proportions of foreign matter in snapped cotton for all of the five years for each ginning period at the two gins it was found that the averages of each ginning period were significantly different for only two periods, the October 1-17 and November 14-30 ginning periods (Table XIV). The range in differences in average per cent foreign matter between the two gins, by ginning periods, was .4 to 9.3 per cent.

Average within each season by ginning periods. Examination was made of the data relating to differences in the foreign matter content between the two gins by ginning periods within each season. It was found that in 1954 all of the periods that could be tested were not

TABLE XXIV

COMPARISON OF THE AVERAGE PER CENT OF FOREIGN MATTER IN SHAPED COTTON,
BY YEARS, TWO GINS, TENNESSEE, 1954-1958^a

Year	Bemis Gin	Towry Gin	Two Gins
Average Per Cent Foreign Matter			
1954	34.7	29.8	33.4
1955	35.7	32.1	35.2
1956	39.4	34.0	35.1
1957	33.3	33.0	33.2
1958	31.5	33.0	32.1
5-Year	34.9	32.2	34.2

^aSource: Appendices F and I.

TABLE XXV

COMPARISON OF THE FIVE-YEAR AVERAGE PER CENT OF FOREIGN MATTER
IN SNAPPED COTTON, BY GINNING PERIODS, TWO GINS,
TENNESSEE, 1954-1958^a

Ginning Period	Bemis Gin	Towry Gin	Two Gins
Average Per Cent Foreign Matter			
Sept. 1-15	^b	-	-
Sept. 16-30	-	20.5	20.5
Oct. 1-17	17.9	27.2	24.3
Oct. 18-31	28.5	30.1	29.2
Nov. 1-13	34.3	31.6	33.6
Nov. 14-30	34.7	33.0	34.2
Dec. 1-12	37.4	34.9	36.8
Dec. 13-Mar. 20	35.9	36.3	35.9

^aSource: Appendices F and I.

^bNo data available during these periods.

significantly different (Table XXVI). Two ginning periods in 1955 were not significantly different in average per cent foreign matter, the December 1-12 and December 13-March 20 periods. In 1956 only one period, October 18-31, was not significantly different. In 1957 all periods were significantly different except the November 14-30 and December 13-March 20 periods. In 1958 all periods were significantly different except November 1-13 and December 13-March 20.

TABLE XXVI

COMPARISON OF THE AVERAGE PER CENT OF FOREIGN MATTER IN SHAPED COTTON
BY GINNING PERIODS, WITHIN EACH SEASON, TWO GINS,
TENNESSEE, 1954-1958^a

Year	Gin	Sept. 1-15	Sept. 16-30	Oct. 1-17	Oct. 18-31	Nov. 1-13	Nov. 14-30	Dec. 1-12	Dec. 13- Mar. 20
Average Per Cent Foreign Matter									
1954	Bemis	- ^b	-	25.5	32.8	34.7	35.7	33.8	41.4
	Towry	-	20.5	27.4	31.3	32.3	36.4	-	-
	2 Gins	-	20.5	27.2	32.2	34.5	35.8	33.8	41.4
1955	Bemis	-	-	22.3	10.6	34.8	36.6	37.2	36.8
	Towry	-	-	-	27.1	27.6	30.4	35.4	36.9
	2 Gins	-	-	22.2	14.9	32.5	34.7	37.0	36.8
1956	Bemis	-	-	-	31.5	25.6	38.2	39.9	41.4
	Towry	-	-	-	28.3	30.6	35.3	34.4	-
	2 Gins	-	-	-	30.4	27.7	36.7	38.4	41.4
1957	Bemis	-	-	18.7	35.9	33.5	31.3	31.5	33.9
	Towry	-	-	26.1	28.4	32.3	33.0	40.5	38.1
	2 Gins	-	-	24.9	28.9	32.8	32.0	34.5	34.3
1958	Bemis	-	-	13.9	25.5	30.8	30.3	38.3	35.1
	Towry	-	-	27.0	-	34.0	35.3	32.8	34.3
	2 Gins	-	-	18.1	25.5	32.0	31.6	35.1	34.9

^aSources: Appendices F and I.

^bNo data available during these periods.

CHAPTER VI

FOREIGN MATTER CONTENT IN SEED COTTON AS RELATED TO RAINFALL

There are many factors related to the amount of foreign matter in seed cotton. The number of rainy days during the harvesting season was believed to be one of them. This particular factor was chosen for analysis, however, not because it was considered the most important, but because there were accurate data available from the weather stations in the areas studied.

Rainy days can affect the amount of foreign matter in the cotton in many different ways. For example, bolls and foliage of the cotton near the ground collect a considerable quantity of dirt splashed on them by rains. The rain also makes particles of dirt stick to the entire plant. The effects of rainfall are also closely related to the boll-weevil destruction, boll rot, and other disease and insect damage which cause an increase in the per cent of foreign matter in the seed cotton.¹ Therefore, the primary purpose of this chapter was to compare the number of rainy days during the harvesting season with the per cent of foreign matter in seed cotton, by specified periods, in order to determine the extent of the relationship. Two consecutive ginning periods have been combined in each instance to make four periods in all for this part of

¹David C. Neal, Cotton Diseases and Methods of Control, U. S. Department of Agriculture, Bulletin No. 1745 (Washington: Government Printing Office, May, 1935), pp. 2, 18; W. D. Hunter, The Boll Weevil Problem, U. S. Department of Agriculture, Bulletin No. 848 (Washington: Government Printing Office, August, 1917), p. 4.

the study.

I. NUMBER OF RAINY DAYS AS RELATED TO PER CENT FOREIGN MATTER IN TOTAL COTTON

In examining the data relating the number of rainy days to the per cent of foreign matter in total cotton, 1954-1958, a positive relationship was noted (Table IXVII). A linear correlation revealed that there was a significant relationship between the number of rainy days and the average per cent of foreign matter.² In each of the years it was found that the number of rainy days was greater in the latter part of the season, as was the average per cent of foreign matter. In examining the data for the September period it was found that at both gins there were a greater number of rainy days and higher percentages of foreign matter in 1957 and 1958 than there were in the three previous years. In the October and November periods the highest per cent of foreign matter occurred with the largest number of rainy days in 1957 at the Towry gin.

In relating the number of days that it rained to the per cent of foreign matter for all the periods from 1954 to 1958 the data revealed that during a few periods, as the season advanced, there was a high per cent of foreign matter associated with a small number of rainy days; for example, the October period, 1954, at the Towry gin, and the October period, 1958, at the Bemis gin. This situation can be expected since

² $r = .81$, $r^2 = .66$, $1 - r^2 = .34$. The r was tested at the 95 per cent level.

TABLE XXVII

FOREIGN MATTER IN TOTAL COTTON AND NUMBER OF RAINY DAYS,
BY SPECIFIED PERIODS, TWO GINS, TENNESSEE, 1954-1958^a

Year	Gin	September		October		November		Dec.-Mar. 20	
		Foreign	Rainy	Foreign	Rainy	Foreign	Rainy	Foreign	Rainy
		Matter	Days ^b	Matter	Days	Matter	Days	Matter	Days
		%	No.	%	No.	%	No.	%	No.
1954	Bemis	4.7	5	8.0	8	23.2	8	26.0	42
	Towry	3.9	5	11.2	3	22.0	8	- ^c	37
1955	Bemis	4.5	4	5.9	5	11.0	8	28.3	37
	Towry	3.5	4	4.7	3	12.8	8	30.1	45
1956	Bemis	4.5	1	6.4	6	9.7	5	30.1	47
	Towry	4.3	4	4.7	8	9.0	4	28.4	39
1957	Bemis	8.0	10	6.6	8	13.3	14	24.3	30
	Towry	5.6	14	14.4	10	23.7	16	33.2	32
1958	Bemis	9.3	9	6.0	3	10.3	9	20.0	33
	Towry	9.5	10	7.1	7	8.8	8	22.6	33

^aSource: Appendices D and G; U. S. Department of Commerce, Climatological Data, Tennessee, 1954-1959, Vol. LIX, No. 9, to Vol. LXIV, No. 3, U. S. Weather Bureau (Washington: Government Printing Office, 1954-1959).

^bAny day when there was more than a trace of precipitation.

^cInsufficient data available for comparison.

there was not a perfect correlation between the two variables. Also, there are many other factors associated with the amount of foreign matter in cotton, such as temperature, soils, fertilizers, cultural methods, varietal characteristics, disease and insect damage, exposure of open cotton before harvest, method of harvest, and the quality of the ginning service.³

II. NUMBER OF RAINY DAYS AS RELATED TO PER CENT FOREIGN MATTER IN PICKED COTTON

The data concerning the number of days that it rained and the average per cent of foreign matter in the picked cotton within each of the years studied revealed that there was some relationship (Table XXVIII). For example, a linear correlation indicated that there was a significant relationship between the number of days that it rained at the two gin areas and the per cent of foreign matter in picked cotton by specified periods for each of the five years.⁴ The number of rainy days was greater and the per cent of foreign matter higher in the latter part of the season during each of the five years.

In studying the number of rainy days and per cent foreign matter in picked cotton, it was found that at both gins in 1957 and 1958 there were a greater number of rainy days and a higher average per cent of

³Harry Bater Brown and Jacob Osborn Ware, Cotton (third edition; New York: McGraw-Hill Book Company, Inc., 1958), pp. 169-233, 248-251, 291-310, 320-338, 347-351, 423; V. R. Cardozer, Growing Cotton (New York: McGraw-Hill Book Company, Inc., 1957), pp. 39-59, 137-147.

⁴ $r = .39$, $r^2 = .15$, $1 - r^2 = .85$. The r was tested at the 95 per cent level.

TABLE XXVIII

FOREIGN MATTER IN PICKED COTTON AND NUMBER OF RAINY DAYS,
BY SPECIFIED PERIODS, TWO GINS, TENNESSEE, 1954-1958^a

Year	Gin	September		October		November		Dec.-Mar. 20	
		Foreign	Rainy	Foreign	Rainy	Foreign	Rainy	Foreign	Rainy
		Matter	Days ^b	Matter	Days	Matter	Days	Matter	Days
		%	No.	%	No.	%	No.	%	No.
1954	Bemis	4.7	5	5.8	8	6.8	8	7.7	42
	Towry	3.6	5	6.7	3	8.5	8	- ^c	37
1955	Bemis	4.5	4	5.8	5	6.3	8	9.2	37
	Towry	3.5	4	4.4	3	7.2	8	8.2	45
1956	Bemis	4.5	1	6.2	6	6.6	5	5.5	47
	Towry	4.3	4	4.6	8	6.2	4	6.1	39
1957	Bemis	8.0	10	6.5	8	8.4	14	11.7	30
	Towry	5.6	14	12.2	10	7.8	16	7.0	32
1958	Bemis	9.3	9	5.9	3	9.4	9	10.0	33
	Towry	9.5	10	6.2	7	6.0	8	7.8	33

^aSource: Appendices E and H; U. S. Department of Commerce, Climatological Data, Tennessee, 1954-1959, Vol. LIX, No. 9, to Vol. LXIV, No. 3, U. S. Weather Bureau (Washington: Government Printing Office, 1954-1959).

^bAny day when there was more than a trace of precipitation.

^cInsufficient data available for comparison.

foreign matter than for the previous three years during the month of September.

In examining the data pertaining to the average per cent of foreign matter in picked cotton and the number of rainy days in each of the gin areas by specified periods for the five years it was found that 15 per cent of the variability in the average per cent of foreign matter was associated with the number of rainy days (Table XXVIII). This correlation was not as great, however, as that found in Table XXVII, where the data included all seed cotton, both picked and snapped. This seemed to indicate that the effects of rain on the amount of foreign matter in seed cotton is less for picked than for snapped cotton.

III. NUMBER OF RAINY DAYS AS RELATED TO PER CENT FOREIGN MATTER IN SNAPPED COTTON

In studying the data pertaining to the number of rainy days and the proportion of foreign matter in snapped cotton by years it was found that there was a relationship (Table XXIX). For example, a linear correlation between the number of days that it rained and the average per cent of foreign matter in the cotton by specified periods for the five years revealed a significant positive relationship at the two gins.⁵ It was also noted that, generally, as the season progressed, the average per cent of foreign matter increased, as did the number of rainy days.

⁵ $r = .55$, $r^2 = .30$, $1 - r^2 = .70$. The r was tested at the 95 per cent level.

TABLE XXIX

FOREIGN MATTER IN SNAPPED COTTON AND NUMBER OF RAINY DAYS,
BY SPECIFIED PERIODS, TWO GINS, TENNESSEE, 1954-1958^a

Year	Gin	September		October		November		Dec.-Mar. 20	
		Foreign	Rainy	Foreign	Rainy	Foreign	Rainy	Foreign	Rainy
		Matter	Days ^b	Matter	Days	Matter	Days	Matter	Days
		%	No.	%	No.	%	No.	%	No.
1954	Bemis	- ^c	-	32.1	8	35.0	8	37.5	42
	Towry	20.5	5	29.6	3	33.4	8	-	-
1955	Bemis	-	-	11.5	5	35.9	8	36.9	37
	Towry	-	-	27.1	3	29.3	8	36.2	45
1956	Bemis	-	-	31.5	6	34.7	5	40.4	47
	Towry	-	-	28.3	8	34.4	4	34.4	39
1957	Bemis	-	-	27.9	8	32.2	14	33.7	30
	Towry	-	-	27.9	10	32.6	16	40.0	32
1958	Bemis	-	-	17.5	3	30.5	9	36.0	33
	Towry	-	-	27.0	7	34.5	8	33.5	33

^aSource: Appendices F and I; U. S. Department of Commerce, Climatological Data, Tennessee, 1954-1959, Vol. LIX, No. 9, to Vol. LXIV, No. 3, U. S. Weather Bureau (Washington: Government Printing Office, 1954-1959).

^bAny day when there was more than a trace of precipitation.

^cInsufficient data available for comparison.

CHAPTER VII

FOREIGN MATTER CONTENT IN SEED COTTON AS RELATED TO LOCATIONS WITHIN A GIN AREA

In this chapter a study was made of the variation of foreign matter in seed cotton from different locations around the Bemis gin, Madison County, Tennessee (Figure 15). The purpose of this examination was to test the assumption that the amount and proportion of foreign matter in the cotton (total, picked, or snapped) varied erratically from community to community in the gin area. In order to test this assumption, the data on all of the cotton from the Bemis gin were separated into various locations by years. From some locations there was not enough cotton to make a comparison, and in this case some of the locations that were near each other were combined. Also, the location of some of the cotton could not be determined, and all of this cotton was placed in the group called "unknown."

I. FOREIGN MATTER IN TOTAL COTTON

The foreign matter in total cotton varied greatly from location to location (Table XXX). For example, when the average per cent of foreign matter in total cotton for each of the locations was examined, the averages were found to be significantly different.¹ The greatest

¹The hypothesis of no difference among means of different locations is rejected if $F_{.95} (15, 60) \geq 1.84$. The F ratio was equal to $76.4 \div 29.5 = 2.59$. So the hypothesis of no difference among means of different locations was rejected, and it was concluded that there is

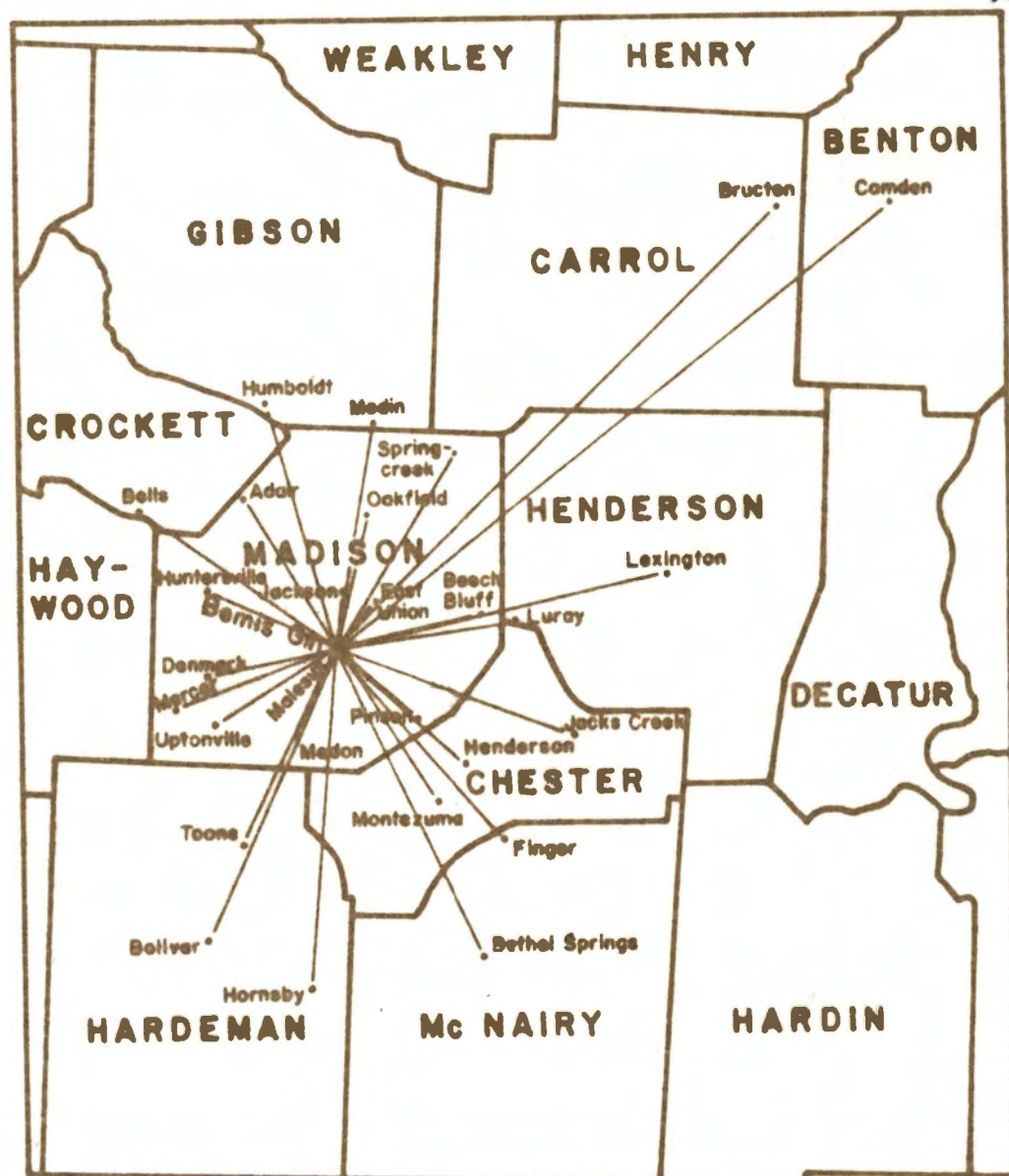


FIGURE 15

GIN PATRONAGE AREAS FROM WHICH DATA ON FOREIGN MATTER
IN SEED COTTON WAS USED IN THIS STUDY, REMIS GIN,
MADISON COUNTY, TENNESSEE, 1954-1958

TABLE XXX

VARIATION IN AVERAGE PER CENT OF FOREIGN MATTER IN TOTAL COTTON,
BY LOCATIONS, BEMIS GIN, MADISON COUNTY,
TENNESSEE, 1954-1958^a

Location	1954	1955	1956	1957	1958	Five- Year
Average Per Cent Foreign Matter						
Jackson	14.9	11.7	6.7	12.2	6.3	9.6
Jackson Rt. 1 (NW.)	4.8	13.5	6.7	10.8	6.9	8.7
Jackson Rt. 4 (N. & E.)	19.2	16.9	9.6	33.1	5.5	21.1
Jackson Rt. 5 (NE.)	10.0	11.0	5.1	14.1	7.3	9.3
Jackson Rt. 6 (E.)	14.2	12.8	20.9	13.0	8.9	13.4
Jackson Rt. 3 (SE.)	4.8	10.1	6.1	11.5	8.1	8.4
Pinson	8.6	11.2	9.2	11.6	8.4	10.2
Malesus and Bemis	4.2	7.3	5.8	10.2	7.0	7.4
Jackson Rt. 7 (S. & SW.)	3.7	11.2	5.0	8.3	5.7	6.9
Uptonville and Mercer	3.6	19.9	11.4	15.9	18.9	15.4
Denmark	7.7	13.5	5.9	10.4	8.5	9.6
Jackson Rt. 2 (W.)	4.0	26.5	4.4	19.8	6.3	13.7
Henderson County	15.3	10.4	17.2	11.3	7.7	12.6
Chester County	29.6	13.7	21.7	17.6	12.7	17.9
Other counties ^b	19.6	10.4	11.0	23.8	19.5	18.2
Unknown	9.8	12.6	15.0	4.0	14.5	10.5
Year Average	9.7	11.7	7.8	11.9	7.9	9.6

^aSource: Appendix J.

^bOther counties include: Gibson, Carroll, Benton, McNairy and Hardeman.

variation in foreign matter among locations occurred in 1957. During this year, the average per cent of foreign matter in the cotton ranged from 4 per cent for "unknown" locations to 33.1 per cent for Jackson Rt. 4. The least variation among locations by years occurred in 1958, ranging from 5.5 per cent at Jackson Rt. 4 to 19.5 per cent in the "other counties" group. The smallest average per cent (3.6) of foreign matter in the total cotton for the five years occurred at the Uptonville and Mercer location in 1954, and the highest (33.1) at the Jackson Rt. 4 location in 1957.

The average per cent of foreign matter varied greatly by years for each of the locations (Table XXX). When an analysis of variance was made of the variation among years for the locations, using the average per cent of foreign matter at each location as an observation, it was found that the foreign matter content of the cotton for the years studied was significantly different.²

The greatest variation over the five-year period occurred at the Jackson Rt. 4 location, with a range of 5.5 to 33.1 per cent, a difference of 27.6 per cent. The smallest variation occurred at the Pinson location, with a range of 8.4 to 11.6 per cent.

evidence to believe that they are significantly different. Note: This test was made on the five-year average per cent of foreign matter for each of the locations, using the average for each year as an observation.

²The hypothesis of no difference among means of different years is rejected if $F_{.95}(4,60) \geq 2.53$. The F ratio was equal to $81.4 \div 29.5 = 2.76$. So the hypothesis of no difference among means of different years was rejected, and it was concluded that there is evidence to believe that they are significantly different.

II. FOREIGN MATTER IN PICKED COTTON

The data revealed very little difference among locations in foreign matter content of picked cotton for the five years studied (Table XXXI). When the average per cents for each of the locations were examined, they were found not to be significantly different.³ The average for each of the locations varied very little from the five-year average of 6.4 per cent.

The foreign matter content in the cotton varied considerably from year to year at the various locations, however. For example, when an analysis of variance was made of the variation for the locations, using the average per cent of foreign matter at each location as an observation, they were found to be significantly different.⁴ The greatest difference over the five-year period occurred at the Jackson Rt. 6 location, with a range of 3.8 to 13.8 per cent. The least difference occurred at the Jackson location, with a range of 5.4 to 7.5 per cent.

³The hypothesis of no difference among means of different locations is rejected if $F_{.95}(15,60) \geq 1.84$. The F ratio was equal to $4.6 \div 4.3 = 1.07$. So the hypothesis of no difference among means of different locations was rejected, and it was concluded that there is evidence to believe that they are not significantly different.

⁴The hypothesis of no difference among means of different years is rejected if $F_{.95}(4,60) \geq 2.53$. The F ratio was equal to $25.8 \div 4.3 = 6.0$. So the hypothesis of no difference among means of different years was rejected, and it was concluded that there is evidence to believe that they are significantly different.

TABLE XXXI

VARIATION IN AVERAGE PER CENT OF FOREIGN MATTER IN PICKED COTTON,
BY LOCATIONS, BIRNIS GIN, MADISON COUNTY,
TENNESSEE, 1954-1958^a

Location	1954	1955	1956	1957	1958	Five- Year
Average Per Cent Foreign Matter						
Jackson	7.0	5.7	5.4	7.5	6.3	6.0
Jackson Rt. 1 (NW.)	4.8	6.3	4.7	7.9	6.8	6.4
Jackson Rt. 4 (N. & E.)	4.6	3.4	3.9	11.2	5.5	5.2
Jackson Rt. 5 (NE.)	5.8	6.9	3.3	7.8	6.0	6.3
Jackson Rt. 6 (E.)	3.8	6.0	13.8	7.1	7.6	7.7
Jackson Rt. 3 (SE.)	4.8	6.8	5.0	8.0	7.5	6.8
Pinson	4.2	6.0	5.9	7.6	6.7	6.6
Malesus and Bemis	4.2	4.9	5.0	8.4	6.8	6.3
Jackson Rt. 7 (S. & SW.)	3.7	6.1	4.8	6.6	5.3	5.5
Uptonville and Mercer	3.6	5.1	4.5	10.6	13.3	6.9
Denmark	5.0	7.6	4.4	8.1	6.7	6.5
Jackson Rt. 2 (W.)	4.0	6.6	4.4	7.9	6.3	6.0
Henderson County	8.5	5.7	4.9	6.3	7.7	6.7
Chester County ^b	5.0	6.5	5.1	7.5	7.4	6.7
Other counties ^b	6.6	5.3	11.0	11.5	11.2	9.8
Unknown	5.4	4.8	11.1	4.0	13.5	6.2
Year Average	5.3	6.0	5.4	7.7	7.1	6.4

^aSource: Appendix K.

^bOther counties include: Gibson, Carroll, Benton, McMairy, and Hardeman.

III. FOREIGN MATTER IN SNAPPED COTTON

The foreign matter in snapped cotton varied only slightly from location to location (Table XXIII). When an analysis of variance was made of the data, it was found that there was no significant difference in the average per cent of foreign matter for the different locations.⁵ The five-year average per cent of 34.9 varied very little from the average for each of the locations.

The foreign matter content of the snapped cotton varied considerably among years at each of the locations (Table XXIII). When the data was examined, it was found that there was a significant difference.⁶ The greatest variation occurred at the Chester County location, ranging from 25.2 to 42.5 per cent. Other locations having a high variation by years were: Jackson Rt. 5, Jackson Rt. 3, Jackson Rt. 7, and Henderson County. The smallest difference over the five-year period occurred at the Jackson Rt. 2 location.

In relating the foreign matter in cotton to locations within the gin area the large variation that was found in total cotton appeared to be highly associated with method of harvest. When the total cotton was

⁵The hypothesis of no difference among means of different locations is rejected if $F_{.95} (15,48) \geq 1.92$. The F ratio was equal to $6.3 \div 17.1 = .37$. So the hypothesis of no difference among means of different locations was rejected, and it was concluded that there is evidence to believe that they are not significantly different.

⁶The hypothesis of no difference among means of different years is rejected if $F_{.95} (4,48) \geq 2.61$. The F ratio was equal to $64.3 \div 17.1 = 3.76$. So the hypothesis of no difference among means of different years was rejected, and it was concluded that there is evidence to believe that they are significantly different.

TABLE XXXII

VARIATION IN AVERAGE PER CENT OF FOREIGN MATTER IN SNAPPED COTTON,
BY LOCATIONS, BEMIS GIN, MADISON COUNTY,
TENNESSEE, 1954-1958^a

Location	1954	1955	1956	1957	1958	Five- Year
Average Per Cent Foreign Matter						
Jackson	32.3	36.9	34.8	32.8	^b	34.9
Jackson Rt. 1 (NW.)	-	39.1	38.2	32.5	34.8	37.0
Jackson Rt. 4 (N. & E.)	38.8	35.0	44.6	36.4	-	36.7
Jackson Rt. 5 (NE.)	32.4	37.2	27.5	34.5	39.5	35.3
Jackson Rt. 6 (E.)	35.4	36.0	38.1	34.9	36.6	36.2
Jackson Rt. 3 (SE.)	-	33.6	39.2	33.9	26.8	33.2
Pinson	30.5	34.9	40.2	33.1	32.9	34.8
Malesus and Bemis	-	37.2	36.7	30.0	35.3	34.1
Jackson Rt. 7 (S. & SW.)	-	38.3	31.9	36.3	21.5	35.7
Uptonville and Mercer	-	37.1	38.1	31.1	30.6	30.2
Denmark	36.2	32.5	37.5	30.4	38.3	33.3
Jackson Rt. 2 (W.)	-	37.1	-	35.3	-	36.7
Henderson County	30.7	35.5	40.8	28.0	-	34.1
Chester County	36.5	25.2	42.5	35.5	37.7	34.4
Other counties ^c	34.7	39.3	-	28.4	33.8	30.4
Unknown	34.6	40.7	42.3	-	30.4	35.5
Year Average	34.7	35.7	39.4	33.3	31.5	34.9

^aSource: Appendix L.

^bNo data available at these locations for these periods.

^cOther counties include: Gibson, Carroll, Benton, McNairy, and Hardeman.

broken down into picked and snapped cotton, neither were significantly different among locations. But there were still considerable variations among years after the cotton was broken down into method of harvest.

Although the data on average proportions of foreign matter for picked and snapped cotton among some locations revealed no significant differences, there was considerable variation among individual bales for each of the locations. This variation is revealed when the ranges for individual bales are examined for total, picked, and snapped cotton (Appendices J, K, and L).

CHAPTER VIII

SUMMARY AND CONCLUSIONS

In Tennessee there is a wide variation in the extent of ginner dockage for foreign matter in seed cotton. Secondary sources reveal that over 94 per cent of the 297 ginneries in the state use a dockage system to determine the amount of foreign matter in hand-picked and hand-snapped cotton. If the dockage exceeds the amount of foreign matter in the cotton, the ginner profits to the extent of the value of the cottonseed in the excess dockage. On the other hand, if the dockage is lower than the actual amount of foreign matter in the seed cotton, the ginner sustains a loss, and this may be reflected in higher ginning rates. Very little, if any, accurate data were available on the extent of the actual variation of the amount of foreign matter in seed cotton at gins in Tennessee. With this situation in mind, this study has been primarily concerned with determining the variation in dockage methods being used by Tennessee ginneries and the actual variation that exists in foreign matter in seed cotton at selected gins in the state.

For this study data were collected on 11,538 bales of cotton from two gins in Tennessee during the years, 1954-1958. These were the only two gins in the state that had seed scales and also had kept records from which the amount of foreign matter in the cotton could be determined for individual bales throughout the seasons. Data were also used from a survey of 127 gins in Tennessee to determine the differences in dockage methods used by the ginneries. Weather data and other information were

taken from secondary sources.

To determine the variation in ginner methods of dockage for foreign matter and the actual variation of foreign matter in seed cotton in terms of the data which have been presented, attention is called to the assumptions made in chapter I. The first assumption was that only a few of the methods commonly used by ginners for estimating the weight of cottonseed or the amount of foreign matter in seed cotton gave either the ginner or his customer any assurance of accuracy. The findings in this study supported this assumption. The variation in the results of using different methods of dockage by 127 ginners in Tennessee, when measured in terms of cottonseed, ranged from 0 to 185 pounds per bale for hand-picked cotton, 100 to 840 pounds per bale for hand-snapped cotton, and 50 to 375 pounds for machine-picked cotton.

For the five-year period, 1954-1958, the per cent of foreign matter averaged 6.2 per cent in picked cotton and 34.2 per cent in hand-snapped cotton. When the average per cent of foreign matter in the cotton was applied to the results of using the different methods of dockage employed by the 127 gins, 43 per cent overdocked and 48 per cent underdocked in hand-picked cotton. In hand-snapped cotton 27 per cent overdocked, 54 per cent underdocked, and 11 per cent did not report.

The second assumption stated was that the foreign matter in seed cotton (total, picked, or snapped) varied greatly from bale to bale. The findings of this study upheld this assumption. The foreign matter content among the 11,538 bales of cotton examined ranged from 0 to 68 per cent. Picked cotton ranged from 0 to 21 per cent, and snapped cotton

ranged from 8 to 68 per cent in foreign matter content.

The third assumption was that the foreign matter in the cotton (total, picked, or snapped) varied considerably from beginning to end of the ginning season. The findings substantiated this assumption. The foreign matter in the cotton (total, picked, or snapped) varied greatly from one ginning period to another. As the season progressed, the per cent of foreign matter generally increased, but varied from ginning period to ginning period at a variable rate.

The fourth assumption was that the foreign matter in the cotton (total, picked, or snapped) varied considerably from season to season. The findings did not support this assumption for snapped cotton since there were no significant differences in the foreign matter content of snapped cotton for each of the years studied at either of the two gins examined. The data upheld the assumption for picked cotton since there was a significant difference in its foreign matter content during the five years studied at both of the gins. For picked cotton wide variation existed among seasons, and error to either the ginner or the producer may occur if a standard dockage system is used.

The fifth assumption was that the foreign matter in the cotton varied greatly from picked to snapped cotton. The findings supported this assumption. The average per cent of foreign matter in snapped cotton was much higher than in picked cotton, and it varied at a variable rate from ginning period to ginning period. This means the producer could play an important part in determining the amount of foreign matter in his cotton by his care in harvesting and his choice of harvesting

methods.

The sixth assumption stated that the foreign matter in seed cotton (total, picked, or snapped) varied erratically from gin to gin in different geographical areas. The findings did not entirely support this assumption. The five-year averages of percentages of foreign matter of the two gins studied were not significantly different for total cotton, but they were for snapped and picked cotton individually. However, the averages of foreign matter content by years for a majority of the five years were significantly different for all cotton (total, picked, or snapped). The data on the foreign matter content for the five-year averages for each of the ginning periods for total cotton were also significantly different in six of the eight ginning periods. Furthermore, the averages for picked cotton were significantly different in five of the eight ginning periods; and the averages for snapped cotton showed a significant difference in two of the six ginning periods. In the comparison of the foreign matter content by ginning periods within each season the data revealed that during some years no significant difference existed at any period in the percentages of foreign matter between gins, while during other years, many of the averages showed a significant difference. This was found to be applicable to all cotton, whether total, picked, or snapped. The data for the foreign matter content at the two gins revealed that for the entire period of study the foreign matter content tended to average out and showed no significant difference, while for ginning periods and for some years, there were significant differences.

The seventh assumption was that a high percentage of the variability in foreign matter in cotton was associated with the variability in number of rainy days during the harvesting season. The findings in this study supported this assumption. It was found by correlation analysis that 66 per cent of the variability in foreign matter was associated with the variability in the number of rainy days during the harvesting season.

The last assumption was that the amount and proportion of foreign matter in seed cotton varied erratically from community to community in a gin area. The findings supported this assumption for total cotton; but when the data were broken down into picked and snapped cotton, there were no significant differences among the five-year averages for each of the locations. There were, however, considerable variations in foreign matter content among the individual bales within each location. Also, there was a significant difference in the foreign matter content among years at the different locations for total, picked, and snapped cotton.

The dockage methods for determining foreign matter in seed cotton reported in this study are not consistent with the actual variation found in the foreign matter content of the cotton where the gins have seed scales. In order to reduce this inconsistency in the marketing of cotton, it is recommended that ginners give consideration to the installation of seed scales.

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BIBLIOGRAPHY

BIBLIOGRAPHY

- Brown, Harry Bater, and Jacob Osborn Ware. Cotton. Third edition. New York: McGraw-Hill Book Company, Inc., 1958.
- Campbell, John D. Estimating the Weight of Cottonseed by Gins. U. S. Department of Agriculture, Farmers Cooperative Service Report 29. Washington: Government Printing Office, July, 1957.
- Cardonier, V. R. Growing Cotton. New York: McGraw-Hill Book Company, Inc., 1957.
- Grerwell, Charles F. Disadvantages of Selling Cotton in the Seed. U. S. Department of Agriculture, Bulletin No. 375. Washington: Government Printing Office, August 9, 1916.
- Groxton, Frederick E., and Dudley J. Cowden. Practical Business Statistics. Second edition. New York: Prentice-Hall, Inc., 1948.
- Dixon, Wilfrid J., and Frank J. Massey, Jr. Introduction to Statistical Analysis. Second edition. New York: McGraw-Hill Book Company, Inc., 1957.
- Downen, M. L., and E. J. Lebrun. Marketing Cottonseed in Tennessee. Monograph No. 233. Knoxville: Tennessee Agricultural Experiment Station, 1947.
- Esakiel, Mordicia. Methods of Correlation Analysis. Second edition. New York: John Wiley and Sons, Inc., 1941.
- Hudson, James, F. Marketing of Cottonseed in Louisiana. Bulletin No. 400. Baton Rouge: Louisiana Agricultural Experiment Station, January, 1946.
- Hunter, W. D. The Boll Weevil Problem. U. S. Department of Agriculture, Bulletin No. 848. Washington: Government Printing Office, August, 1917.
- Kohls, Richard L. Marketing of Agricultural Products. New York: The MacMillan Company, 1955.
- Lyman, W. S., and others. Soil Survey of Madison County, Tennessee. Series 1906. Washington: Government Printing Office, 1907.
- Marsh, S. T., G. D. Collins, and Sam Guy. Cash Receipts From Farming: Tennessee. Release No. 1973. Nashville: Tennessee Department of Agriculture, September 25, 1959.

- Marsh, S. T., and others. Tennessee Cotton: Acreage, Yield and Production, 1954, 1957, 1958. Tennessee Department of Agriculture, Release Nos. 1541, 1822, and 1946. Nashville: Federal-State Cooperative Reporting Service, 1955, 1958, 1959.
- Neal, David C. Cotton Diseases and Methods of Control. U. S. Department of Agriculture, Bulletin No. 1745. Washington: Government Printing Office, May, 1935).
- Rand McNally and Company. Rand McNally Commercial Atlas and Marketing Guide. Nintietth edition. New York: Rand McNally and Company, 1959.
- Randolph, Foster, L. J. Strickland, and E. F. Henry. Soil Survey of Lincoln County, Tennessee. Bulletin No. 16. Knoxville: Tennessee Agricultural Experiment Station, February, 1946.
- Raskopf, B. D. Factors Affecting Cotton Prices in Ginners Markets in Tennessee. Bulletin No. 251. Knoxville: Tennessee Agricultural Experiment Station, September, 1956.
- Raskopf, B. D. Cotton Ginning Industry in Tennessee. Bulletin No. 303. Knoxville: Tennessee Agricultural Experiment Station, September, 1959.
- Smith, H. P., Joseph T. Rouse, and D. T. Killough. Comparison of Different Methods of Harvesting Cotton. Bulletin No. 683. College Station: Texas Agricultural Experiment Station, October, 1946.
- Tennessee ASC Committee. Tennessee Annual Statistical Report ASC Programs, 1958. U. S. Department of Agriculture. Washington: Government Printing Office, September, 1959.
- Tennessee Department of Agriculture. Agricultural Trends in Tennessee. Third edition. Nashville: Agricultural Marketing Service, November, 1958.
- U. S. Bureau of the Census. Cotton Production in the United States, 1954-1958. Washington: Government Printing Office, 1955-1959.
- U. S. Bureau of the Census. County and City Data Book, 1956. A Statistical Abstract Supplement. Washington: Government Printing Office, 1957.
- U. S. Department of Agriculture. Climate and Man: 1941 Yearbook of Agriculture. Washington: Government Printing Office, 1941.
- U. S. Department of Agriculture. Cotton Quality Statistics, United States, 1954-1958. Statistical Bulletins No. 170, 202, 220, and 240. Washington: Government Printing Office, 1955-1959.

- U. S. Department of Agriculture. Cotton Varieties Planted, 1954-1958.
Memphis: Agricultural Marketing Service, Cotton Division, 1954-1958.
- U. S. Department of Agriculture. Soils and Man: 1938 Yearbook of Agriculture. Washington: Government Printing Office, 1938.
- U. S. Department of Commerce. Climatological Data, Tennessee, 1954-1959.
Vol. LIX, No. 9, to Vol. LXIV, No. 3. U. S. Weather Bureau.
Washington: Government Printing Office, 1954-1959.

APPENDICES

APPENDIX A

NUMBER OF BALES OF COTTON GINNED AND IN SAMPLE, BY GINNING PERIODS,
WITHIN EACH SEASON, TWO GINS, TENNESSEE, 1954-1958^a

Ginning Periods		1954		1955		1956		1957		1958	
Gin		Ginned	Sample	Ginned	Sample	Ginned	Sample	Ginned	Sample	Ginned	Sample
Number of Bales											
Sept., 1-15	Bemis	501	272	80	64	731	391	79	65	69	69
	Towry	192	121	17	7	16	5	35	24	0	0
Sept., 16-30	Bemis	1,076	536	348	155	874	436	362	181	606	406
	Towry	548	350	391	141	301	145	121	65	10	6
Oct., 1-17	Bemis	750	374	860	371	834	417	1,016	506	1,011	999
	Towry	398	228	705	153	646	220	355	93	186	83
Oct., 18-31	Bemis	488	225	740	317	360	180	376	188	579	570
	Towry	186	94	673	100	356	115	200	58	298	33
Nov., 1-13	Bemis	480	205	648	277	156	78	378	189	218	218
	Towry	53	24	310	66	272	79	259	56	126	29
Nov., 14-30	Bemis	132	74	258	116	60	30	210	105	99	99
	Towry	37	7	136	47	305	44	107	32	161	37
Dec., 1-12	Bemis	22	20	204	85	86	77	128	62	33	33
	Towry	7	1	29	7	104	23	36	12	112	33
Dec., 13-Mar., 20	Bemis	14	13	322	196	31	31	359	229	90	88
	Towry	3	0	95	16	0	0	117	11	225	23
Total	Bemis	3,463	1,719	3,460	1,581	3,132	1,640	2,908	1,525	2,489	2,482
	Towry	1,424	825	2,356	537	2,000	631	1,230	351	1,118	244

^aSource: U. S. Department of Commerce, Bureau of the Census, Cotton Production in the United States, (Washington: Government Printing Office, 1954, 1955, 1956, 1957, and 1958), 1954, p. 33; 1955, p. 33; 1956, p. 33; 1957, p. 34; and 1958, p. 35, and gin record books.

APPENDIX B

NUMBER OF BALES OF COTTON GINNED, BY GINNING PERIODS, WITHIN EACH SEASON,
TWO COUNTIES, TENNESSEE, 1954-1958^a

Ginning Periods	County	1954	1955	1956	1957	1958
Number of Bales Ginned						
Sept. 1-15	Lincoln	1,347	200	365	480	^b
	Madison	3,682	1,276	7,495	1,118	849
Sept. 16-30	Lincoln	4,036	3,273	2,490	1,237	248
	Madison	8,257	3,530	8,814	3,259	3,841
Oct. 1-17	Lincoln	3,190	4,570	4,028	2,290	1,615
	Madison	6,269	7,169	6,850	7,372	9,529
Oct. 18-31	Lincoln	1,589	3,910	2,064	1,366	1,686
	Madison	3,788	6,402	2,667	3,491	6,111
Nov. 1-13	Lincoln	411	1,962	1,490	1,720	645
	Madison	3,138	5,904	1,033	3,295	3,104
Nov. 14-30	Lincoln	104	620	1,360	868	797
	Madison	1,137	3,134	487	2,152	1,442
Dec. 1-12	Lincoln	17	182	663	415	522
	Madison	118	1,952	203	1,495	615
Dec. 13-Mar. 20	Lincoln	39	246	173	603	780
	Madison	152	3,361	155	1,902	918
Totals	Lincoln	10,733	14,863	12,633	8,979	6,293
	Madison	26,541	32,728	27,704	24,084	26,409
Totals for Both Counties		37,274	47,687	40,337	34,063	32,702

^aSource: U. S. Department of Commerce, Bureau of the Census, Cotton Production in the United States, (Washington: Government Printing Office, 1954, 1955, 1956, 1957, and 1958), 1954, p. 33; 1955, p. 33; 1956, p. 33; 1957, p. 34; and 1958, p. 35.

^bIncluded in Sept. 16-30 period.

APPENDIX C

NUMBER OF BALES OF COTTON GINNED BY GINNING PERIODS, WITHIN EACH SEASON, TENNESSEE, 1954-1958^a

Ginning Periods	1954	1955	1956	1957	1958
	Number of Bales Ginned				
Sept. 1-15	73,799	23,298	101,503	11,977	6,436
Sept. 16-30	160,286	84,353	157,958	58,720	48,750
Oct. 1-17	124,714	135,497	139,857	120,606	142,670
Oct. 18-31	80,179	125,836	64,983	65,123	92,765
Nov. 1-13	62,760	102,932	31,137	56,708	49,350
Nov. 14-30	24,446	59,605	18,417	34,318	30,570
Dec. 1-12	4,677	32,565	9,281	25,333	16,589
Dec. 13-Mar. 20	3,140	48,973	4,348	31,507	23,908
Totals	534,001	613,059	527,484	404,292	411,038

^aSources: U. S. Department of Commerce, Bureau of the Census, Cotton Production in the United States, (Washington: Government Printing Office, 1954, 1955, 1956, 1957, and 1958), 1954, p. 33; 1955, p. 33; 1956, p. 33; 1957, p. 34; and 1958, p. 35.

APPENDIX B

FOREIGN MATTER IN TOTAL COTTON, BY YEARS AND BY GINNING PERIODS, TOWRY GIN, LINCOLN COUNTY, TENNESSEE, 1954-1958^a

Crop Year	Item	Unit	September			October			November			December-March 20			Total
			1-15	16-30	1-17	18-31	1-13	14-30	Dec. 1-12	Dec.-Mar. 13-20					
1954	Bales	No.	121	350	228	94	24	7	1	-					825
	Seed C.	Lbs.	163,770	471,383	321,144	138,408	37,272	10,550	1,190	-					1,143,717
	F. M. C.	Lbs.	4,795	19,678	29,747	21,514	7,736	2,792	98	-					86,360
	F. M.	%	2.9	4.2	9.2	15.5	20.8	26.5	8.2	-					7.6
	Range	%	0.0-8.7	0.0-27.0	0.3-34.6	0.6-48.5	4.6-42.4	5.8-44.3	0	-					0.0-48.5
1955	Bales	No.	7	141	153	100	66	47	7	16					537
	Seed C.	Lbs.	10,260	192,175	212,300	138,010	90,936	68,630	11,370	29,410					753,091
	F. M. C.	Lbs.	428	6,623	9,022	7,563	9,572	10,862	2,910	9,350					56,330
	F. M.	%	4.2	3.4	4.2	5.5	10.5	15.8	25.6	31.8					7.5
	Range	%	1.1-10.3	0.1-17.2	0.1-16.9	0.1-29.3	0.1-41.4	0.1-37.3	1.5-39.5	7.5-41.0					0.1-41.4
1956	Bales	No.	5	145	220	115	79	44	23	-					631
	Seed C.	Lbs.	6,930	198,469	295,290	158,948	109,653	66,520	42,100	-					877,910
	F. M. C.	Lbs.	119	8,663	14,282	7,193	7,312	8,532	11,944	-					58,045
	F. M.	%	1.7	4.4	4.8	4.5	6.7	12.8	28.4	-					6.6
	Range	%	1.2-7.9	0.1-10.9	0.3-16.5	0.2-28.4	0.7-33.2	0.5-38.1	3.4-39.7	-					0.1-39.7

APPENDIX D (continued)

Crop Year	Item	Unit	September			October			November			December-March 20			Total
			1-15	16-30	1-31	1-31	1-31	1-31	1-31	1-31	1-31	Dec.	Jan.	Feb.	
1957	Bales	No.	24	66	93	56	32	11	351						
	Seed C.	Lbs.	32,452	89,943	134,140	94,610	54,700	21,100	532,815						
	F. M.	Lbs.	1,641	5,213	21,350	21,596	13,780	8,030	87,696						
	F. M.	\$	5.1	5.8	15.9	22.8	25.2	38.1	16.5						
	Range	\$	0.0-16.0	2.0-14.6	0.4-28.2	1.2-30.5	1.1-46.0	25.2-47.3	0.0-47.6						
1958	Bales	No.	-	6	83	29	37	23	244						
	Seed C.	Lbs.	-	8,690	123,076	41,377	52,600	38,540	364,740						
	F. M.	Lbs.	-	829	9,243	3,852	4,388	9,675	41,689						
	F. M.	\$	-	9.5	7.5	9.3	8.3	25.1	11.4						
	Range	\$	-	3.4-15.1	0.4-36.5	0.2-8.8	1.1-40.1	4.2-50.8	0.2-50.8						
Total or Avg.	Bales	No.	157	707	777	254	167	50	2,588						
	Seed C.	Lbs.	213,412	960,660	1,085,950	373,848	253,000	89,050	3,672,273						
	F. M.	Lbs.	6,983	41,006	83,644	50,068	40,354	27,055	330,120						
	F. M.	\$	3.3	4.3	7.7	13.4	16.0	30.4	9.0						
	Range	\$	0.0-16.0	0.0-27.0	0.1-36.5	0.1-48.5	0.1-46.0	4.2-50.8	0.0-50.8						

^aSource: Gin record books.

^bNo data available at Tommy gin during this period.

^cForeign matter.

APPENDIX E

FOREIGN MATTER IN PICKED COTTON, BY YEARS AND BY GINNING PERIODS, TONRY GIN, LINCOLN COUNTY, TENNESSEE, 1954-1958^a

Crop Year	Item	Unit	September			October			November			December-March 20		Total
			1-15	16-30	1-17	18-31	1-13	14-30	Dec. 1-12	Dec.-Mar. 13-20				
1954	Bales	No.	121	345	204	67	14	3	1	-	-	755		
	Seed C.	Lbs.	163,770	463,653	280,234	89,438	18,012	3,840	1,190	-	-	1,020,137		
	F. M.	Lbs.	4,797	18,090	18,519	6,171	1,513	347	98	-	-	49,535		
	F. M.	%	2.9	3.9	6.6	6.9	8.4	9.0	8.2	-	-	4.9		
	Range	%	0.0-8.7	0.0-14.6	0.3-15.5	0.6-11.6	4.6-14.6	5.8-16.6	0	-	-	0.0-16.6		
1955	Bales	No.	7	141	153	97	57	33	3	4	-	495		
	Seed C.	Lbs.	10,260	192,175	212,300	132,400	75,640	43,570	3,540	5,720	-	675,605		
	F. M.	Lbs.	428	6,623	9,022	6,045	5,355	3,238	142	620	-	31,473		
	F. M.	%	4.2	3.4	4.2	4.6	7.1	7.4	4.0	10.8	-	4.7		
	Range	%	1.1-10.3	0.1-17.2	0.2-16.9	0.1-12.6	0.1-10.9	0.1-15.0	1.5-9.1	7.5-12.9	-	0.1-17.2		
1956	Bales	No.	5	145	220	113	77	37	7	-	-	604		
	Seed C.	Lbs.	6,930	198,469	295,290	155,688	106,053	52,620	8,920	-	-	823,970		
	F. M.	Lbs.	119	8,663	14,282	6,271	6,212	3,620	544	-	-	39,711		
	F. M.	%	1.7	4.4	4.8	4.0	5.9	6.9	6.1	-	-	4.8		
	Range	%	1.2-8.0	0.1-12.3	0.3-16.5	0.2-12.2	0.7-15.8	0.5-17.1	3.4-11.8	-	-	0.1-17.1		

APPENDIX B (continued)

Crop Year	Item	Unit	September			October			November			December-March 20			Total
			1-15	16-30	1-17	18-31	1-13	14-30	Dec.		Dec.-Mar.				
									1-12	13-20	1-12	13-20			
1957	Bales	No.	24	65	89	45	26	12	5	-	-	-	-	266	
	Seed G.	Lbs.	32,452	89,943	126,590	61,610	37,000	16,740	7,630	-	-	-	-	371,965	
	F. N.	Lbs.	1,641	5,213	19,377	3,560	2,962	1,252	537	-	-	-	-	34,542	
	F. N.	%	5.1	5.8	15.3	5.8	8.0	7.5	7.0	-	-	-	-	9.3	
	Range	%	0.0-16.0	2.0-14.6	0.4-17.4	1.2-10.7	2.3-16.6	1.4-16.9	1.6-11.3	-	-	-	-	0.0-17.4	
1958	Bales	No.	-	6	79	33	26	35	18	10	-	-	-	207	
	Seed G.	Lbs.	-	8,690	115,986	48,052	35,787	49,140	24,615	13,950	-	-	-	296,220	
	F. N.	Lbs.	-	829	7,328	2,838	1,952	3,168	1,759	1,236	-	-	-	19,110	
	F. N.	%	-	9.5	6.3	5.9	5.5	6.4	7.1	8.9	-	-	-	6.5	
	Range	%	-	3.4-15.1	0.4-16.3	0.2-8.8	1.3-8.0	1.1-14.8	0.8-15.2	4.2-11.4	-	-	-	0.2-16.3	
Total or Avg.	Bales	No.	157	702	745	355	200	120	34	14	-	-	-	2,327	
	Seed G.	Lbs.	213,412	952,930	1,030,400	487,188	272,492	165,910	45,895	19,670	-	-	-	3,187,897	
	F. N.	Lbs.	6,985	39,418	68,528	24,885	17,994	11,625	3,080	1,856	-	-	-	174,371	
	F. N.	%	3.3	4.1	6.7	5.1	6.6	7.0	6.7	9.4	-	-	-	5.5	
	Range	%	0.0-16.0	0.0-17.2	0.1-17.4	0.1-12.6	0.1-16.6	0.1-17.1	0.8-15.2	4.2-12.9	-	-	-	0.0-17.4	

^aSources: Gin record books.

^bNo data available at Tawry gin during these periods.

^cForeign matter.

FOREIGN MATTER IN SNAPPED COTTON, 87 YEARS AND BY GUNNING PERIODS,
TOMMY OIL, LINCOLN COUNTY, TENNESSEE, 1954-1958

Crop Year	Item	Unit	September		October		November		December-March 20		Total
			1-15	16-30	1-17	18-31	1-23	11-30	Dec. 1-12	Dec.-Mar. 13-20	
1954	Bales	No.	b	5	24	27	10	4	-	-	70
	Seed C.	Lbs.	-	7,730	40,910	48,970	19,260	6,710	-	-	123,580
	F. M. C.	Lbs.	-	1,586	11,228	15,343	6,223	2,445	-	-	36,827
	F. M.	%	-	20.5	27.4	31.3	32.3	36.4	-	-	29.8
	Range	%	-	16.8-27.0	17.6-34.6	29.7-48.5	26.7-42.4	32.6-44.3	-	-	16.8-48.5
1955	Bales	No.	-	-	-	3	9	14	4	12	42
	Seed C.	Lbs.	-	-	-	5,600	15,296	25,060	7,830	23,690	77,486
	F. M. C.	Lbs.	-	-	-	1,518	4,217	7,624	2,768	8,730	24,857
	F. M.	%	-	-	-	27.1	27.6	30.4	35.4	36.9	32.1
	Range	%	-	-	-	25.0-29.3	23.8-41.4	25.7-37.3	32.5-39.5	35.3-41.0	23.8-41.4
1956	Bales	No.	-	-	-	2	2	7	16	-	27
	Seed C.	Lbs.	-	-	-	3,260	3,600	13,900	33,180	-	53,940
	F. M. C.	Lbs.	-	-	-	922	1,100	4,912	11,400	-	18,334
	F. M.	%	-	-	-	28.3	30.6	35.3	34.4	-	34.0
	Range	%	-	-	-	28.1-40.4	28.1-33.2	34.5-38.1	22.9-39.7	-	22.9-39.7

APPENDIX F (continued)

Crop Year	Item	Unit	September			October			November			December			Total
			1-15	16-30	1-17	18-31	1-13	14-30	1-12	13-20	21-31	1-12	13-20	21-31	
1957	Bales	No.	-	-	-	13	30	20	7	11	85	13	11	11	85
	Seed C.	Lbs.	-	-	7,550	23,600	57,610	37,960	13,030	21,100	160,850	5,278	8,030	160,850	160,850
	F. H.	Lbs.	-	-	1,973	6,711	18,634	12,528	5,278	8,030	53,154	40.5	38.1	53,154	53,154
	F. H.	%	-	-	26.1	28.4	32.3	33.0	40.5	38.1	33.0	40.5	38.1	33.0	33.0
	Range	%	-	-	19.3-28.2	23.0-38.5	20.9-38.0	19.6-46.0	35.7-47.6	25.2-47.3	19.3-47.6	35.7-47.6	25.2-47.3	19.3-47.6	19.3-47.6
1958	Bales	No.	-	-	-	-	3	2	15	13	37	15	13	13	37
	Seed C.	Lbs.	-	-	7,090	-	5,590	3,460	27,790	24,590	68,520	9,105	8,439	22,579	68,520
	F. H.	Lbs.	-	-	1,915	-	1,900	1,220	9,105	8,439	22,579	32.8	34.3	33.0	22,579
	F. H.	%	-	-	27.0	-	34.0	35.3	32.8	34.3	33.0	32.8	34.3	33.0	33.0
	Range	%	-	-	22.4-36.5	-	28.7-36.0	30.5-40.1	19.2-40.1	21.3-50.8	19.2-50.8	19.2-40.1	21.3-50.8	19.2-50.8	19.2-50.8
Total or Avg.	Bales	No.	-	5	32	45	54	47	42	36	261	42	36	36	261
	Seed C.	Lbs.	-	7,730	55,550	81,440	101,356	87,090	81,830	69,380	484,376	81,830	69,380	484,376	484,376
	F. H.	Lbs.	-	1,588	15,116	24,494	32,074	28,729	28,551	25,199	155,751	28,551	25,199	155,751	155,751
	F. H.	%	-	20.5	27.2	30.1	31.6	33.0	34.9	36.3	32.2	34.9	36.3	32.2	32.2
	Range	%	-	16.8-27.0	17.6-36.5	23.0-48.5	20.9-42.4	19.6-46.0	19.2-47.6	21.3-50.8	16.8-50.8	19.2-47.6	21.3-50.8	16.8-50.8	16.8-50.8

*Source: Gin record books.

bNo data available at Terry gin during these periods.

cForeign matter.

APPENDIX C

FOREIGN MATTER IN TOTAL COTTON, BY YEARS AND BY GINNING PERIODS, BEMIS GIN, MADISON COUNTY, TENNESSEE, 1954-1958^a

Crop Year	Item	Unit	September			October		November		December-March 20		Total
			1-15	16-30	1-17	18-31	1-13	14-30	Dec. 1-12	Dec.-Mar. 13-20		
1954	Bales	No.	272	536	374	225	205	74	20	13	1,719	
	Seed C.	Lbs.	374,014	739,525	525,249	322,526	332,230	120,460	30,560	22,580	2,467,144	
	F. M. b	Lbs.	16,267	35,626	31,039	36,454	76,269	28,693	6,684	7,143	238,175	
	F. M.	%	4.3	4.8	5.9	11.3	22.9	23.8	21.9	31.6	9.7	
	Range	%	0.0-16.8	0.2-21.1	0.2-29.4	0.2-55.2	0.7-65.3	0.5-68.3	0.9-37.8	6.7-45.7	0.0-68.3	
1955	Bales	No.	64	155	371	317	277	116	85	196	1,581	
	Seed C.	Lbs.	86,190	218,160	532,160	447,925	396,130	178,430	152,900	341,990	2,353,885	
	F. M.	Lbs.	3,827	9,740	33,681	24,474	33,973	29,268	43,834	96,325	275,122	
	F. M.	%	4.4	4.5	6.3	5.5	8.6	16.4	28.7	28.2	11.7	
	Range	%	1.7-8.9	0.2-8.4	0.9-22.3	0.7-28.3	0.7-38.7	0.7-60.1	4.7-54.8	2.1-58.0	0.2-60.1	
1956	Bales	No.	391	436	417	180	78	30	77	31	1,640	
	Seed C.	Lbs.	538,752	576,462	553,272	240,575	106,647	44,844	137,460	61,430	2,259,442	
	F. M.	Lbs.	25,420	24,435	36,506	14,255	7,460	7,213	40,298	19,577	175,164	
	F. M.	%	4.7	4.2	6.6	5.9	7.0	16.1	29.3	31.9	7.8	
	Range	%	0.0-12.2	0.0-10.3	0.1-17.9	0.1-31.5	0.4-27.1	0.2-45.7	1.5-51.7	0.2-57.6	0.0-57.6	

APPENDIX G (continued)

Crop Year	Item	Unit	September			October			November			December-March 20			Total
			1-15	16-30		1-17	18-31		1-13	14-30		Dec. 1-12	13-20		
1957	Bales	No.	65	181		506	188		189	105		62	229		1,525
	Seed C.	Lbs.	90,968	261,559		716,459	268,561		270,875	165,404		94,307	393,043		2,261,176
	F. M.	Lbs.	6,393	23,692		46,107	18,873		30,126	27,989		15,865	102,678		269,723
	F. M.	%	4.8	9.1		6.4	7.9		11.1	16.9		16.8	26.1		11.9
	Range	%	3.3-12.4	1.6-17.7		0.0-18.7	2.0-35.9		0.4-41.2	1.7-39.1		4.7-38.5	2.1-47.9		0.0-47.9
1958	Bales	No.	69	406		1,001	571		218	99		33	88		2,485
	Seed C.	Lbs.	96,798	590,480		1,415,242	796,079		304,527	140,535		51,850	138,150		3,533,661
	F. M.	Lbs.	7,201	56,543		86,853	45,617		27,952	17,878		9,706	28,298		280,048
	F. M.	%	7.4	9.6		6.1	5.7		9.2	12.7		18.7	20.5		7.9
	Range	%	0.9-12.7	0.0-18.5		0.0-29.2	0.0-39.2		0.1-37.8	1.1-40.0		1.5-42.1	0.0-44.5		0.0-44.5
Total or Avg.	Bales	No.	861	1,714		2,669	1,481		967	424		277	557		8,950
	Seed C.	Lbs.	1,186,722	2,386,186		3,742,382	2,075,666		1,410,409	649,673		467,077	957,193		12,875,308
	F. M.	Lbs.	57,108	150,036		234,186	139,673		175,780	111,041		116,387	254,021		1,238,232
	F. M.	%	4.8	6.3		6.3	6.7		12.5	17.1		24.9	26.5		9.6
	Range	%	0.0-16.8	0.0-21.1		0.0-29.4	0.0-55.2		0.1-65.3	0.2-68.3		0.9-54.8	0.0-58.0		0.0-68.3

^aSources: Gin record books.

^bForeign matter.

APPENDIX H

FOREIGN MATTER IN PICKED COTTON, MY YEARS AND BY GINNING PERIODS,
BEMIS GIN, MADISON COUNTY, TENNESSEE, 1954-1958a

Crop Year	Item	Unit	September			October			November			December-March 20			Total
			1-15	16-30		1-17	18-31		1-13	14-30		Dec. 1-12	Dec.-Mar. 13-20		
1954	Bales	No.	272	536		370	193		102	37		11	5		1,526
	Seed C.	Lbs.	374,014	739,525		518,339	259,880		138,170	51,120		13,752	6,720		2,101,520
	F. M. b	Lbs.	16,267	35,626		29,274	15,895		8,930	3,905		995	584		111,476
	F. M.	\$	4.3	4.8		5.6	6.1		6.5	7.6		7.2	8.7		5.3
	Range	\$	0.0-16.8	0.2-21.1		0.2-16.3	0.2-20.6		0.7-17.9	0.5-13.1		0.9-14.7	6.7-11.6		0.0-21.1
1955	Bales	No.	64	155		370	306		259	87		34	79		1,354
	Seed C.	Lbs.	86,190	218,160		530,800	432,205		362,360	121,710		46,420	107,160		1,905,005
	F. M.	Lbs.	3,827	9,740		33,378	22,806		22,221	8,515		4,253	9,936		114,676
	F. M.	\$	4.4	4.5		6.3	5.3		6.1	7.0		9.2	9.3		6.0
	Range	\$	1.7-8.9	0.2-8.4		0.9-16.3	0.7-14.5		0.7-16.2	0.7-18.0		4.7-16.8	2.1-17.1		0.2-18.0
1956	Bales	No.	391	436		417	177		75	24		33	13		1,566
	Seed C.	Lbs.	538,752	576,462		553,272	234,622		101,947	32,874		46,010	20,090		2,104,029
	F. M.	Lbs.	25,420	24,435		36,506	12,379		6,259	2,636		3,846	2,441		113,922
	F. M.	\$	4.7	4.2		6.6	5.3		6.1	8.0		8.4	12.2		5.4
	Range	\$	0.0-12.2	0.0-10.3		0.1-17.9	0.1-19.8		0.4-11.2	0.2-8.8		1.5-10.8	0.2-18.0		0.0-19.8

APPENDIX H (continued)

Crop Year	Item	Unit	September			October			November			December-March 20			Total
			1-15	16-30	1-17	18-31	1-13	14-30	Dec.	Dec.-Mar.	13-20				
1957	Bales	No.	65	181	505	187	170	75	48	100		1,331			
	Seed C.	Lbs.	90,968	261,559	715,029	266,921	235,239	110,831	67,792	139,823		1,888,162			
	F. M.	Lbs.	4,393	23,692	45,840	18,285	18,201	10,882	7,500	16,738		145,531			
	F. M.	%	4.8	9.1	6.4	6.9	7.7	9.8	11.1	12.0		7.7			
	Range	%	3.3-12.4	1.6-17.7	0.0-15.6	2.0-11.3	0.4-14.5	1.7-16.3	4.7-16.8	2.1-19.5		0.0-19.5			
1958	Bales	No.	69	406	991	567	212	94	24	60		2,423			
	Seed C.	Lbs.	96,798	590,480	1,400,042	789,309	294,837	131,295	32,410	84,280		3,419,451			
	F. M.	Lbs.	7,201	56,543	84,744	43,889	24,967	15,081	2,253	9,368		244,046			
	F. M.	%	7.4	9.6	6.1	5.5	8.5	11.5	7.0	11.1		7.1			
	Range	%	0.9-12.7	0.0-18.5	0.0-15.6	0.0-12.5	0.1-12.5	1.1-12.5	1.5-10.1	0.0-17.9		0.0-18.5			
Total or Avg.	Bales	No.	861	1,714	2,653	1,430	818	317	150	257		8,200			
	Seed C.	Lbs.	1,186,722	2,386,186	3,717,482	1,982,937	1,132,553	447,830	206,384	358,073		11,418,167			
	F. M.	Lbs.	57,108	150,036	229,742	113,254	80,578	41,019	18,847	39,067		729,651			
	F. M.	%	4.8	6.3	6.2	5.7	7.1	9.2	9.1	10.9		6.4			
	Range	%	0.0-16.8	0.0-21.1	0.0-17.9	0.0-20.6	0.1-17.9	0.2-18.0	0.9-16.8	0.0-19.5		0.0-21.1			

Source: Gin record books.

by foreign matter.

APPENDIX I

FOREIGN MATTER IN SNAPPED COTTON, BY YEARS AND BY GINNING PERIODS, BEMIS GIN, MADISON COUNTY, TENNESSEE, 1954-1956

Crop Year	Item	Unit	September			October			November			December-March 20			Total
			1-15	16-30	1-17	18-31	1-13	14-30	1-12	13-20	21-31	1-12	13-20	21-31	
1954	Bales	No. ^b	-	-	4	32	103	37	9	8	193	16,808	15,860	8	365,624
	Seed C.	Lbs.	-	-	6,910	62,646	194,060	69,340	5,689	6,559	126,699	5,689	6,559	41.4	34.7
	F. M. ^c	Lbs.	-	-	1,765	20,559	67,339	24,788	33.8	37.4	34.7	33.8	37.4	41.4	15.2-68.3
	F. M.	%	-	-	25.5	32.8	34.7	35.7	33.8	37.4	34.7	33.8	37.4	41.4	15.2-68.3
	Range	%	-	-	22.7-29.4	19.7-55.2	15.2-65.3	15.3-68.3	24.0-37.8	37.4-45.7	15.2-68.3	24.0-37.8	37.4-45.7	15.2-68.3	15.2-68.3
1955	Bales	No.	-	-	1	11	18	29	51	117	227	106,480	234,830	117	448,880
	Seed C.	Lbs.	-	-	1,360	15,720	33,770	56,720	39,581	86,389	160,446	39,581	86,389	36.8	35.7
	F. M.	Lbs.	-	-	303	1,668	11,752	20,753	37.2	36.8	35.7	37.2	36.8	36.8	35.7
	F. M.	%	-	-	22.3	10.6	34.8	36.6	37.2	36.8	35.7	37.2	36.8	36.8	35.7
	Range	%	-	-	0	7.9-28.3	27.8-36.7	17.8-60.1	29.2-54.8	18.6-58.0	7.9-60.1	29.2-54.8	18.6-58.0	7.9-60.1	7.9-60.1
1956	Bales	No.	-	-	-	3	3	6	44	18	74	91,450	41,340	18	155,413
	Seed C.	Lbs.	-	-	-	5,953	4,700	11,970	36,452	17,136	61,242	36,452	17,136	41.4	39.4
	F. M.	Lbs.	-	-	-	1,876	1,201	4,577	39.9	41.4	39.4	39.9	41.4	41.4	39.4
	F. M.	%	-	-	-	31.5	25.6	38.2	31.3	31.3	31.3	31.3	31.3	31.3	31.3
	Range	%	-	-	-	0	23.7-27.1	33.1-45.7	31.3-51.7	27.5-57.6	23.7-27.1	31.3-51.7	27.5-57.6	23.7-27.1	23.7-27.1

APPENDIX I (continued)

Crop Year	Item	Unit	September		October		November		December		Total
			1-15	16-30	1-17	18-31	1-13	14-30	1-12	13-20	
1957	Bales	No.	-	-	1	1	19	30	14	129	194
	Seed C.	Lbs.	-	-	1,430	1,640	35,636	54,573	26,515	253,220	373,014
	F. M.	Lbs.	-	-	267	508	11,925	17,107	8,365	85,940	124,192
	F. M.	%	-	-	18.7	35.9	33.5	31.3	31.5	33.9	33.3
	Range	%	-	-	0	0	26.8-41.2	15.3-39.1	18.6-38.5	18.9-47.9	15.3-47.9
1958	Bales	No.	-	-	10	4	6	5	9	28	62
	Seed C.	Lbs.	-	-	15,200	6,770	9,690	9,240	19,440	53,870	114,210
	F. M.	Lbs.	-	-	2,109	1,728	2,985	2,797	7,453	18,930	36,002
	F. M.	%	-	-	13.9	25.5	30.8	30.3	38.3	35.1	31.5
	Range	%	-	-	11.4-29.2	20.0-39.2	23.6-37.8	21.6-40.0	31.0-42.1	31.7-44.5	11.4-44.5
Total or Avg.	Bales	No.	-	-	16	51	149	107	127	300	750
	Seed C.	Lbs.	-	-	24,900	92,729	277,856	201,843	260,693	599,120	1,457,141
	F. M.	Lbs.	-	-	4,444	26,419	95,202	70,022	97,540	214,954	508,581
	F. M.	%	-	-	17.9	28.5	34.3	34.7	37.4	35.9	34.9
	Range	%	-	-	11.4-29.4	7.9-55.2	15.2-65.3	15.3-68.3	18.6-54.8	18.6-58.0	7.9-68.3

^aSource: Gin record books.

^bNo data available at Benis gin during these periods.

^cForeign matter.

APPENDIX J

FOREIGN MATTER IN TOTAL COTTON BY LOCATIONS AND BY YEARS, DEMIS CUM, MADISON COUNTY, TENNESSEE, 1954-1958^a

Location	Item	Unit	1954	1955	1956	1957	1958	Five-Year	
								Avg.	or Total
Jackson ^b	Bales	No.	8	56	64	33	24	185	
	Seed C.	Lbs.	12,940	83,770	90,039	49,502	34,660	270,911	
	F. M. C	Lbs.	1,922	9,784	6,074	6,059	2,190	26,029	
	F. M.	%	14.9	11.7	6.7	12.2	6.3	9.6	
	Range	%	4.8-34.9	2.0-37.9	0.0-35.5	2.8-37.1	3.5-8.4	0.0-37.9	
Jackson Rt. 1 (NW.) ^d	Bales	No.	31	116	136	117	277	677	
	Seed C.	Lbs.	42,390	171,930	181,406	169,199	388,267	953,192	
	F. M.	Lbs.	2,041	23,177	12,073	18,294	26,923	82,508	
	F. M.	%	4.8	13.5	6.7	10.8	6.9	8.7	
	Range	%	1.0-9.3	1.0-60.1	0.0-41.8	2.0-36.5	1.4-34.8	0.0-60.1	
Jackson Rt. 4 (N. & E.) ^e	Bales	No.	5	11	11	16	5	48	
	Seed C.	Lbs.	7,230	17,070	14,750	30,648	7,180	76,878	
	F. M.	Lbs.	1,390	2,883	1,416	10,158	394	16,241	
	F. M.	%	19.2	16.9	9.6	33.1	5.5	21.1	
	Range	%	3.2-45.8	1.3-37.9	2.0-44.6	5.4-42.5	4.4-6.5	1.3-45.8	
Jackson Rt. 5 (NE.) ^f	Bales	No.	16	39	23	54	129	261	
	Seed C.	Lbs.	22,340	61,010	32,641	84,585	185,948	386,524	
	F. M.	Lbs.	2,234	6,694	1,649	11,917	13,537	36,031	
	F. M.	%	10.0	11.0	5.1	14.1	7.3	9.3	
	Range	%	2.3-40.8	2.5-40.6	2.3-27.5	1.6-39.4	0.5-44.5	0.5-44.5	
Jackson Rt. 6 (N.) ^g	Bales	No.	14	65	39	62	56	236	
	Seed C.	Lbs.	21,029	100,900	58,932	90,812	82,300	355,053	
	F. M.	Lbs.	2,977	13,054	12,346	11,828	7,304	47,509	
	F. M.	%	14.2	12.8	20.9	13.0	8.9	13.4	
	Range	%	0.9-42.1	2.7-40.0	2.3-47.8	0.4-38.8	3.3-39.2	0.4-47.8	

APPENDIX J (continued)

Location	Item	Unit	1954	1955	1956	1957	1958	Five-Year	
								Avg.	or Total
Jackson Rt. 3 (SE.) ^h	Bales	No.	48	239	397	270	571	1,525	
	Seed C.	Lbs.	65,158	351,350	540,239	396,920	825,078	2,178,745	
	F. M.	Lbs.	3,135	35,405	32,767	45,613	66,761	183,681	
	F. M.	%	4.8	10.1	6.1	11.5	8.1	8.4	
	Range	%	0.2-9.8	0.2-43.5	1.1-44.6	0.7-41.3	0.0-42.1	0.0-44.6	
Pinson	Bales	No.	23	246	278	359	287	1,193	
	Seed C.	Lbs.	31,991	367,315	397,413	537,279	420,695	1,754,693	
	F. M.	Lbs.	2,743	41,209	36,506	62,305	35,419	178,182	
	F. M.	%	8.6	11.2	9.2	11.6	8.4	10.2	
	Range	%	1.9-33.5	0.5-46.3	0.0-51.7	0.0-39.6	0.0-41.2	0.0-51.7	
Malesus and Bemis	Bales	No.	19	191	175	172	397	954	
	Seed C.	Lbs.	25,230	280,410	237,961	248,172	566,270	1,358,043	
	F. M.	Lbs.	1,057	20,405	13,903	25,249	39,721	100,335	
	F. M.	%	4.2	7.3	5.8	10.2	7.0	7.4	
	Range	%	0.2-10.2	0.7-39.9	0.0-45.7	1.6-37.1	0.5-36.4	0.0-45.7	
Jackson Rt. 7 (S. & SW.) ⁱ	Bales	No.	43	194	237	164	410	1,048	
	Seed C.	Lbs.	57,743	283,330	313,607	234,542	561,434	1,450,656	
	F. M.	Lbs.	2,150	31,743	15,551	19,438	31,379	100,261	
	F. M.	%	3.7	11.2	5.0	8.3	5.7	6.9	
	Range	%	0.5-8.5	0.7-54.8	0.5-31.9	1.3-47.9	1.6-28.3	0.5-54.8	
Uptonville and Mercer	Bales	No.	9	38	43	28	13	131	
	Seed C.	Lbs.	11,760	61,070	58,474	41,894	19,990	193,188	
	F. M.	Lbs.	419	12,167	6,680	6,678	3,770	29,714	
	F. M.	%	3.6	19.9	11.4	15.9	18.9	15.4	
	Range	%	1.5-5.4	1.6-42.9	0.0-41.1	4.7-37.6	4.6-40.5	0.0-42.9	

APPENDIX J (continued)

Location	Item	Unit	1954	1955	1956	1957	1958	Five-Year	
								Avg.	Total
Denmark	Bales	No.	48	133	127	111	99	518	
	Seed C.	Lbs.	64,563	194,280	169,300	157,744	135,860	722,647	
	F. H.	Lbs.	5,020	26,260	10,027	16,409	11,536	69,252	
	F. H.	%	7.7	13.5	5.9	10.4	8.5	9.6	
	Range	%	1.3-41.7	1.4-57.8	0.0-41.7	3.5-40.1	2.2-43.4	0.0-57.8	
Jackson Rt. 2 (W.) ^j	Bales	No.	3	16	12	9	28	68	
	Seed C.	Lbs.	4,289	29,800	15,960	14,478	38,230	102,757	
	F. H.	Lbs.	171	7,884	709	2,864	2,409	14,037	
	F. H.	%	4.0	26.5	4.4	19.8	6.3	13.7	
	Range	%	3.0-5.3	6.1-39.4	1.7-8.5	4.7-37.2	2.5-9.3	1.7-39.4	
Henderson County	Bales	No.	12	14	8	6	7	47	
	Seed C.	Lbs.	17,619	19,360	11,760	9,129	9,930	67,798	
	F. H.	Lbs.	2,687	2,011	2,018	1,035	760	8,511	
	F. H.	%	15.3	10.4	17.2	11.3	7.7	12.6	
	Range	%	1.8-33.0	2.8-37.2	3.0-44.2	5.0-28.0	5.2-9.4	1.8-44.2	
Chester County	Bales	No.	14	56	32	77	14	193	
	Seed C.	Lbs.	24,880	83,280	54,849	121,795	20,880	305,684	
	F. H.	Lbs.	7,364	11,369	11,916	21,491	2,646	54,786	
	F. H.	%	29.6	13.7	21.7	17.6	12.7	17.9	
	Range	%	1.5-45.7	1.9-42.6	0.0-49.9	3.6-41.7	2.8-39.1	0.0-49.9	
Other Counties ^k	Bales	No.	5	9	14	22	13	63	
	Seed C.	Lbs.	7,040	12,130	20,559	37,336	18,950	96,015	
	F. H.	Lbs.	1,379	1,260	2,271	8,886	3,701	17,497	
	F. H.	%	19.6	10.4	11.0	23.8	19.5	18.2	
	Range	%	3.3-34.7	2.1-39.3	0.0-16.3	4.8-39.2	6.4-35.9	0.0-39.3	

APPENDIX J (continued)

Location	Item	Unit	1954	1955	1956	1957	1958	Five-Year Avg. or Total
Unknown	Bales	No.	1,421	158	44	25	155	1,803
	Seed C.	Lbs.	2,050,042	235,800	61,552	37,441	217,989	2,602,524
	F. M.	Lbs.	201,486	29,817	9,258	1,499	31,598	273,658
	F. M.	%	9.8	12.6	15.0	4.0	14.5	10.5
	Range	%	0.0-68.3	1.7-48.7	1.8-57.6	2.9-12.7	0.0-39.3	0.0-68.3
Total or Average	Bales	No.	1,719	1,581	1,640	1,525	2,485	8,950
	Seed C.	Lbs.	2,467,144	2,353,885	2,259,442	2,261,176	3,533,661	12,875,308
	F. M.	Lbs.	238,175	275,122	175,164	269,723	280,048	1,238,232
	F. M.	%	9.7	11.7	7.8	11.9	7.9	9.6
	Range	%	0.0-68.3	0.2-60.1	0.0-57.6	0.0-47.9	0.0-44.5	0.0-68.3

^aSource: Gin record books.

^bNear vicinity of Jackson.

^cForeign matter.

^dNorthwest of Jackson includes Pope, Middale, and Adair communities.

^eNorth and East of Jackson includes Nashville Highway, and part of Browns communities.

^fNortheast of Jackson includes Browns, Claybrook, Wards Grove, and Spring Creek communities.

^gEast of Jackson includes East Union and Maple Grove communities.

^hSoutheast of Jackson includes Lester Grove and Harts Bridge communities.

ⁱSouth and Southwest of Jackson includes Potts Chapel, Bonwood, Madison Hall, and part of Westover communities.

^jWest of Jackson includes Westover, Huntersville, and Provident communities.

^kOther counties include: Gibson, Carroll, Benton, McNairy, and Hardeman.

APPENDIX I

FOREIGN MATTER IN PICKED COTTON, BY LOCATIONS AND BY YEARS, BENIS GIN,
MADISON COUNTY, TENNESSEE, 1954-1958^a

Location	Item	Unit	1954	1955	1956	1957	1958	Five-Year	
								AVG.	or Total
Jackson ^b	Bales	No.	6	48	62	28	24	168	
	Seed C.	Lbs.	8,930	67,670	85,909	40,300	34,660	237,469	
	F. M.	Lbs.	627	3,848	4,635	3,042	2,190	14,342	
	F. M.	%	7.0	5.7	5.4	7.5	6.3	6.0	
	Range	%	4.8-9.3	2.0-13.3	0.0-9.8	2.8-16.3	3.5-8.4	0.0-16.3	
Jackson Rt. 1 (M.) ^d	Bales	No.	31	98	131	107	276	643	
	Seed C.	Lbs.	42,390	134,380	170,696	149,459	386,277	883,202	
	F. M.	Lbs.	2,041	8,488	7,980	11,880	26,231	56,620	
	F. M.	%	4.8	6.3	4.7	7.9	6.8	6.4	
	Range	%	1.0-9.3	1.0-13.3	0.0-10.8	2.0-16.6	1.4-16.7	0.0-16.7	
Jackson Rt. 4 (M. & E.) ^e	Bales	No.	3	7	10	3	5	28	
	Seed C.	Lbs.	4,140	9,770	13,020	3,925	7,180	38,025	
	F. M.	Lbs.	190	328	644	434	394	1,990	
	F. M.	%	4.6	3.4	4.9	11.1	5.5	5.2	
	Range	%	3.2-6.9	1.3-8.5	2.0-7.0	5.4-17.0	4.4-6.5	1.3-17.0	
Jackson Rt. 5 (M.) ^f	Bales	No.	14	35	22	44	126	241	
	Seed C.	Lbs.	18,820	52,750	30,301	64,743	179,118	345,732	
	F. M.	Lbs.	1,094	3,620	1,005	5,074	10,836	21,629	
	F. M.	%	5.8	6.9	3.3	7.8	6.0	6.3	
	Range	%	2.3-14.6	2.5-17.0	2.3-19.8	1.6-17.6	0.5-13.5	0.5-19.8	
Jackson Rt. 6 (E.) ^g	Bales	No.	10	54	30	53	54	201	
	Seed C.	Lbs.	14,149	78,980	41,572	71,462	78,620	284,783	
	F. M.	Lbs.	541	4,763	5,729	5,076	5,956	22,065	
	F. M.	%	3.8	6.0	13.8	7.1	7.6	7.7	
	Range	%	0.9-5.8	2.7-12.1	2.3-18.1	0.4-15.2	3.3-12.2	0.4-18.1	

APPENDIX K (continued)

Location	Item	Unit	1954	1955	1956	1957	1958	Five-Year	
								Avg.	Total
Jackson Rt. 3 (SE.) ^h	Bales	No.	48	217	389	240	556	1,450	
	Seed C.	Lbs.	65,158	308,320	523,539	342,858	800,598	2,040,473	
	F. M.	Lbs.	3,135	20,926	26,227	27,279	60,200	137,767	
	F. M.	%	4.8	6.8	5.0	8.0	7.5	6.8	
	Range	%	0.2-9.8	0.2-14.5	1.1-10.3	0.7-17.9	0.0-17.1	0.0-17.9	
Pinson	Bales	No.	20	213	261	313	275	1,082	
	Seed C.	Lbs.	26,691	301,365	358,934	453,803	393,705	1,534,498	
	F. M.	Lbs.	1,127	18,175	21,027	34,711	26,552	101,592	
	F. M.	%	4.2	6.0	5.9	7.6	6.7	6.6	
	Range	%	1.9-8.1	0.5-16.2	0.0-12.0	0.0-17.0	0.0-15.5	0.0-17.0	
Malesus and Bemis	Bales	No.	19	181	172	161	395	928	
	Seed C.	Lbs.	25,230	259,890	231,277	227,684	562,750	1,306,831	
	F. M.	Lbs.	1,057	12,768	11,451	19,101	38,477	82,854	
	F. M.	%	4.2	4.9	5.0	8.4	6.8	6.3	
	Range	%	0.2-10.2	0.7-16.8	0.0-10.0	1.6-16.5	0.5-16.4	0.0-16.8	
Jackson Rt. 7 (S. & SW.) ¹	Bales	No.	43	172	236	158	404	1,013	
	Seed C.	Lbs.	57,743	238,110	312,167	221,114	553,034	1,382,168	
	F. M.	Lbs.	2,150	14,423	15,091	14,570	29,575	75,809	
	F. M.	%	3.7	6.1	4.8	6.6	5.3	5.5	
	Range	%	0.5-8.5	0.7-16.3	0.5-8.5	1.3-13.5	1.6-18.5	0.5-18.5	
Uptonville and Mercer	Bales	No.	9	24	36	23	9	101	
	Seed C.	Lbs.	11,760	32,850	46,434	31,041	13,520	135,605	
	F. M.	Lbs.	419	1,687	2,089	3,305	1,792	9,292	
	F. M.	%	3.6	5.1	4.5	10.6	13.3	6.9	
	Range	%	1.5-5.4	1.6-8.8	0.0-9.6	4.7-17.7	4.6-16.3	0.0-17.7	

APPENDIX K (continued)

Location	Item	Unit	1954	1955	1956	1957	1958	Five-Year	
								Ave.	Total
Denmark	Bales	No.	45	107	123	102	95	472	
	Seed C.	Lbs.	59,823	148,040	161,730	141,648	127,970	639,211	
	F. M.	Lbs.	2,980	11,228	7,191	11,512	8,517	41,428	
	F. M.	%	5.0	7.6	4.4	8.1	6.7	6.5	
	Range	%	1.3-12.9	1.4-15.5	0.0-9.9	3.5-19.5	2.2-12.8	0.0-19.5	
Jackson Rt. 2 (W.) ^j	Bales	No.	3	7	12	6	28	56	
	Seed C.	Lbs.	4,289	10,410	15,960	8,208	38,230	77,097	
	F. M.	Lbs.	171	686	709	648	2,409	4,623	
	F. M.	%	4.0	6.6	4.4	7.9	6.3	6.0	
	Range	%	3.0-5.3	6.1-8.0	1.7-8.5	4.7-10.8	2.5-9.3	1.7-10.8	
Henderson County	Bales	No.	9	12	6	5	7	39	
	Seed C.	Lbs.	12,239	16,290	7,740	7,029	9,930	53,228	
	F. M.	Lbs.	1,035	921	378	446	760	3,540	
	F. M.	%	8.5	5.7	4.9	6.3	7.7	6.7	
	Range	%	1.8-15.8	2.8-11.7	3.0-5.9	5.0-7.2	5.2-9.4	1.8-15.8	
Chester County	Bales	No.	5	37	22	56	12	132	
	Seed C.	Lbs.	5,450	51,360	30,459	77,605	17,240	182,114	
	F. M.	Lbs.	275	3,339	1,540	5,790	1,275	12,219	
	F. M.	%	5.0	6.5	5.1	7.5	7.4	6.7	
	Range	%	1.5-7.5	1.9-12.4	0.0-11.1	3.6-13.2	2.8-11.9	0.0-13.2	
Other Counties ^k	Bales	No.	3	8	14	7	9	41	
	Seed C.	Lbs.	3,780	10,310	20,559	10,152	11,900	56,701	
	F. M.	Lbs.	248	544	2,271	1,164	1,317	5,544	
	F. M.	%	6.6	5.3	11.0	11.5	11.1	9.8	
	Range	%	3.3-9.7	2.1-9.7	0.0-16.3	4.8-17.2	6.4-17.9	0.0-17.9	

APPENDIX K (continued)

Location	Item	Unit	1954	1955	1956	1957	1958	Five-Year	
								AVG.	or Total
Unknown	Bales	No.	1,258	134	40	25	148	1,605	
	Seed C.	Lbs.	1,740,928	184,510	53,732	37,141	204,719	2,221,030	
	P. M.	Lbs.	94,386	8,932	5,954	1,499	27,565	138,336	
	P. M.	%	5.4	4.8	11.1	4.0	13.5	6.2	
	Range	%	0.0-21.1	1.7-18.0	1.8-15.3	2.9-12.7	0.0-17.5	0.0-21.1	
Total or Average	Bales	No.	1,526	1,354	1,566	1,331	2,423	8,200	
	Seed C.	Lbs.	2,101,520	1,905,005	2,104,029	1,886,162	3,419,451	11,418,167	
	P. M.	Lbs.	111,476	114,676	113,922	145,531	244,046	729,651	
	P. M.	%	5.3	6.0	5.4	7.7	7.1	6.4	
	Range	%	0.0-21.1	0.2-18.0	0.0-19.8	0.0-19.5	0.0-18.5	0.0-21.1	

^aSource: Gin record books.

^bNear vicinity of Jackson.

^cForeign matter.

^dNorthwest of Jackson includes Pope, Middle, and Adair communities.

^eNorth and East of Jackson includes Northside, Nashville Highway and part of Browns communities.

^fNortheast of Jackson includes Browns, Claybrook, Wards Grove, and Spring Creek communities.

^gEast of Jackson includes East Union and Maple Grove communities.

^hSoutheast of Jackson includes Lester Grove and Harts Bridge communities.

ⁱSouth and Southwest of Jackson includes Potts Chapel, Benwood, Madison Hall, and part of Westover communities.

^jWest of Jackson includes Westover, Huntersville, and Provident communities.

^kOther counties include: Gibson, Carroll, Benton, McElairy, and Hardeman.

APPENDIX L

FOREIGN MATTER IN SHIPPED COTTON, BY LOCATION AND BY YEARS, BENNIS GIN,
MADISON COUNTY, TENNESSEE, 1954-1958^a

Location	Item	Unit	1954	1955	1956	1957	1958	Five-Year Avg. or Total
Jackson ^b	Bales	No.	2	8	2	5	- ^d	17
	Seed C.	Lbs.	4,010	16,100	4,130	9,202	-	33,442
	F. H. C	Lbs.	1,295	5,936	1,439	3,017	-	11,687
	F. H.	%	32.3	36.9	34.8	32.8	-	34.9
	Range	%	29.7-34.9	26.0-37.9	34.1-35.5	23.1-37.1	-	23.1-39.0
Jackson Rt. 1 (W.) ^c	Bales	No.	-	18	5	10	1	34
	Seed C.	Lbs.	-	37,550	10,710	19,740	1,990	69,990
	F. H.	Lbs.	-	14,689	4,093	6,414	692	25,888
	F. H.	%	-	39.1	38.2	32.5	34.8	37.0
	Range	%	-	29.2-60.1	35.9-41.8	23.6-36.5	0	23.6-60.1
Jackson Rt. 4 (N. & E.) ^f	Bales	No.	2	4	1	13	-	20
	Seed C.	Lbs.	3,090	7,300	1,730	26,733	-	38,853
	F. H.	Lbs.	1,200	2,555	772	9,724	-	14,251
	F. H.	%	38.8	35.0	44.6	36.4	-	36.7
	Range	%	31.8-45.8	28.6-37.9	0	26.8-42.5	-	26.9-45.8
Jackson Rt. 5 (NE.) ^g	Bales	No.	2	4	1	10	3	20
	Seed C.	Lbs.	3,520	8,260	2,340	19,842	6,830	40,792
	F. H.	Lbs.	1,140	3,074	644	6,843	2,701	14,402
	F. H.	%	32.4	37.2	27.5	34.5	39.5	35.3
	Range	%	24.0-40.8	34.6-40.6	0	19.1-39.4	31.7-44.5	19.1-44.5
Jackson Rt. 6 (E.) ^h	Bales	No.	4	11	9	9	2	35
	Seed C.	Lbs.	6,880	230,000	17,360	19,350	3,680	70,270
	F. H.	Lbs.	2,436	8,291	6,617	6,752	1,348	25,444
	F. H.	%	35.4	36.0	38.1	34.9	36.6	36.2
	Range	%	30.4-42.1	30.3-40.0	34.0-47.8	29.9-38.8	34.0-39.2	29.9-47.8

APPENDIX L (continued)

Location	Item	Unit	1954	1955	1956	1957	1958	Five-Year	
								AVG.	or Total
Jackson Rt. 3 (SH.) ¹	Bales	No.	-	22	8	30	15	75	
	Seed C.	Lbs.	-	43,030	16,700	54,062	24,480	138,272	
	F. M.	Lbs.	-	14,479	6,540	18,334	6,561	45,914	
	F. M.	%	-	33.6	39.2	33.9	26.8	33.2	
	Range	%	-	32.0-43.5	32.7-44.6	18.6-41.3	17.4-42.1	17.4-44.6	
Pinson	Bales	No.	3	33	17	46	12	111	
	Seed C.	Lbs.	5,300	65,950	38,479	83,476	26,990	220,195	
	F. M.	Lbs.	1,616	23,034	15,479	27,594	8,867	76,590	
	F. M.	%	30.5	34.9	40.2	33.1	32.9	34.8	
	Range	%	28.7-33.5	17.8-46.3	33.1-51.7	21.3-39.6	11.4-41.2	11.4-51.7	
Malesus and Benis	Bales	No.	-	10	3	11	2	26	
	Seed C.	Lbs.	-	20,520	6,684	20,488	3,520	51,212	
	F. M.	Lbs.	-	7,637	2,452	6,148	1,244	17,481	
	F. M.	%	-	37.2	36.7	30.0	35.3	34.1	
	Range	%	-	22.5-39.9	30.8-45.7	19.0-37.1	34.0-36.4	19.0-45.7	
Jackson Rt. 7 (S. & SW.) ³	Bales	No.	-	22	1	6	6	35	
	Seed C.	Lbs.	-	45,220	1,440	13,428	8,400	68,488	
	F. M.	Lbs.	-	17,320	460	4,868	1,804	24,452	
	F. M.	%	-	38.3	31.9	36.3	21.5	35.7	
	Range	%	-	18.6-54.8	0	32.7-47.9	18.1-28.3	18.1-54.8	
Uptonville and Mercer	Bales	No.	-	14	7	5	4	30	
	Seed C.	Lbs.	-	28,220	12,040	10,853	6,470	57,583	
	F. M.	Lbs.	-	10,460	4,591	3,373	1,978	20,422	
	F. M.	%	-	37.1	38.1	31.1	30.6	35.5	
	Range	%	-	31.1-42.9	23.7-41.1	30.2-37.6	28.2-40.5	23.7-42.9	

APPENDIX L (continued)

Location	Item	Unit	1954	1955	1956	1957	1958	Five-Year Avg. or Total
Denmark	Bales	No.						
	Seed C.	Lbs.		26	4	9	4	46
	F. M.	Lbs.	5,640	46,240	7,570	16,096	7,890	83,436
	F. M.	Lbs.	2,040	15,032	2,836	4,897	3,019	27,824
	Range	%	36.2	32.5	37.5	30.4	38.3	33.3
		%	34.7-41.7	18.1-57.8	36.4-41.7	15.3-40.1	24.4-43.4	15.3-57.8
Jackson Rt. 2 (W.) ^k	Bales	No.		9		3		12
	Seed C.	Lbs.		19,390		6,270		25,660
	F. M.	Lbs.		7,198		2,216		9,414
	F. M.	%		37.1		35.3		36.7
	Range	%		34.8-39.4		33.0-37.2		33.0-39.4
Henderson County	Bales	No.		2		1		8
	Seed C.	Lbs.		3,070		2,100		14,570
	F. M.	Lbs.	5,380	1,090	4,020	589		4,971
	F. M.	%	1,652	35.5	40.8	28.0		34.1
	Range	%	30.7	33.6-37.2	37.4-44.2	0		29.8-44.2
		%	29.8-33.0					
Chester County	Bales	No.		19		21		61
	Seed C.	Lbs.		31,920		44,190		123,570
	F. M.	Lbs.	19,430	8,030	10,376	15,701	3,640	42,567
	F. M.	%	36.5	25.2	42.5	35.5	37.7	34.4
	Range	%	28.1-45.7	19.3-42.6	38.8-49.9	24.8-41.7	36.3-39.1	19.3-49.9
Other Counties ^l	Bales	No.		1		15		22
	Seed C.	Lbs.		1,820		27,184		39,314
	F. M.	Lbs.	3,260	776		7,722	7,050	11,953
	F. M.	%	1,131	39.3		28.4	33.8	30.4
	Range	%	34.7	0		18.9-39.2	33.5-35.9	18.9-39.3

APPENDIX L (continued)

Location	Item	Unit	1954	1955	1956	1957	1958	Five-Year Avg. or Total
Unknown	Bales	No.	163	24	4	-	7	198
	Seed C.	Lbs.	309,114	41,290	7,820	-	13,270	381,494
	F. M.	Lbs.	107,100	20,885	3,304	-	4,033	135,322
	F. M.	%	34.6	40.7	42.3	-	30.4	35.5
	Range	%	15.2-68.3	7.9-48.7	40.5-57.6	-	20.0-39.3	7.9-68.3
Total or Average	Bales	No.	193	227	74	194	62	750
	Seed C.	Lbs.	365,624	448,880	155,413	373,014	114,210	1,457,141
	F. M.	Lbs.	126,699	160,446	61,242	124,192	36,002	508,581
	F. M.	%	34.7	35.7	39.4	33.3	31.5	34.9
	Range	%	15.2-68.3	7.9-60.1	23.7-57.6	15.3-47.9	11.4-44.5	7.9-68.3

^aSource: Gin record books.

^bNear vicinity of Jackson.

^cForeign matter.

^dNo data available at Bemis gin during these years for these locations.

^eNorthwest of Jackson includes Pope, Middale, and Adair communities.

^fNorth and East of Jackson includes Northside, Nashville Highway, and part of Browns communities.

^gNortheast of Jackson includes Browns, Claybrook, Wards Grove, and Spring Creek communities.

^hEast of Jackson includes East Union and Maple Grove communities.

ⁱSoutheast of Jackson includes Lester Grove and Harts Bridge communities.

^jSouth and Southwest of Jackson includes Potts Chapel, Bonwood, Madison Hall, and part of Westover communities.

^kWest of Jackson includes Westover, Huntersville, and Provident communities.

^lOther counties include: Gibson, Carroll, Benton, McNairy, and Hardeman.