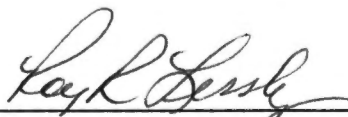


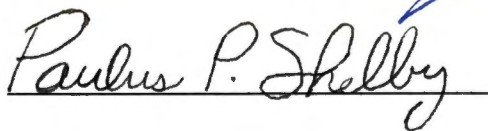
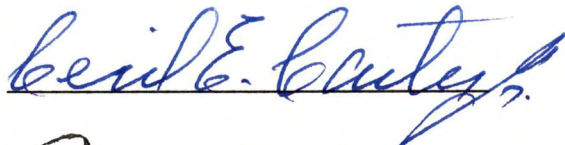
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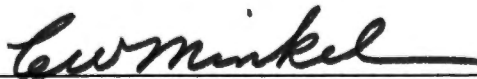


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RELATIONSHIPS BETWEEN CHARACTERISTICS OF COTTON PRODUCTION
IN TENNESSEE, THE NUMBER OF CONTACTS THE PRODUCER HAD
WITH EXTENSION AND THEIR USE OF SELECTED
PRODUCTION PRACTICES

A Thesis
Presented for the
Master of Science
Degree
The University of Tennessee, Knoxville

James Richard Buntin

August 1990

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ABSTRACT

The major purpose of this study was to obtain information that might be useful in developing Extension plans and programs for the cotton producers of Tennessee, characterize cotton production in Tennessee, and identify variables related to the use of cotton production practices. A total of 243 cotton producers located in 13 Tennessee counties provided the survey data in 1987. Tennessee County Extension agents conducted personal interviews with the producers. The "Nth" number method of sampling was used to select the producers to be surveyed. According to the guidelines of the survey, counties growing 2,500 to 10,000 acres of cotton annually interviewed 15 producers, counties growing 10,000 to 25,000 acres of cotton annually interviewed 20 producers, and counties growing over 25,000 acres of cotton annually interviewed 25 producers. Information was obtained regarding the general production practices and the number of contacts the producers had with Extension agents over a 12 month period.

The data were coded and computations were made by the University of Tennessee Computing Center. Chi square and a one-way analysis of variance F test were used to determine the strength of the relationship between the dependent and independent variables. Chi square and F values which achieved the .05 probability level were accepted as significant.

Major findings include the following:

Most producers planted at least two varieties of cotton, 90 percent of the producers planted certified seed, almost all of the producers

planted at least part of their cotton acreage between the recommended planting dates of April 20-May 10, 241 of the 243 producers surveyed used a seed treatment for seedling disease control. Over 65 percent of the producers fertilized by soil test while 89 percent of the producers who used chemical defoliation applied the defoliant when 50 percent or more of the bolls were open and approximately 83 percent of the producers reported a yield of 480 to 959 pounds of lint per acre.

The mean yield per acre was significantly related to 18 out of 54 selected production practices used by Tennessee cotton producers. Producers who used the chisel plow or some "other" piece of equipment for seedbed preparation had higher yields than producers using other single or a combination of pieces of equipment. The variety planted was significantly related to the mean yield per acre as were the type of material used for seed treatment, the use of a soil treatment, and the use of a fungicide plus insecticide for seedling disease control.

Four of the fertilization practices (1) fertilized according to soil test, (2) limed by soil test, (3) pounds of nitrogen applied per acre-upland, and (4) pounds of boron per acre without soil test, were significantly related to mean yield. Producers who used a paid scout were more likely to have significantly higher mean yield than those producers who did not. Producers using chemical defoliation also had significantly higher yields than those not using the practice.

Findings also revealed significant relationships between the number of acres harvested and the use of 19 out of 52 selected production practices. The number of varieties planted, all of the

selected practices related to planting dates, the practice of drilling acid-delinted seed, the type material used for seed treatment, the use of a soil treatment, use of a fungicide, and use of fungicide plus insecticide were all significantly related to the number of acres harvested. Larger producers were more likely to use the practices than were smaller producers. Four of the fertilization and liming practices were significantly related to the number of acres harvested. Larger producers were more likely than smaller producers to use rotation with corn or soybeans and to use post-directed chemical to control weeds, to need to control stink bugs, to scout for insects once per week, to use chemical defoliation, and to own a cotton picker.

There was a significant relationship between the total number of contacts producers had with Extension and 6 of the 46 selected cotton production practices. Producers with more Extension contacts were more likely than producers with fewer contacts with Extension to use a fungicide plus insecticide for seedling disease control, to fertilize according to soil test, to employ a paid scout, and to apply defoliant when 50 percent or more of the bolls were open.

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CHAPTER I

THE PROBLEM AND ITS SETTING

I. INTRODUCTION

Farming and forestry dominate Tennessee's landscape. Approximately 21.5 million acres, 80 percent of the state's land area, is devoted to the production of crops, livestock, timber, and other agricultural products.

Cotton was ranked first in cash receipts from farm marketing of agricultural crops in Tennessee in 1987. However, 1987 was the first year since 1963 that cotton had topped the list. (10:50)*

Cash receipts for lint cotton produced amounted to \$192,635,000 for the 1987 growing season. Cash receipts for cotton seed amounted to \$18,095,000. The combined value of cotton lint and seed was \$210.7 million, compared with the 1986 crop value of \$103.6 million. The average combined value of cotton lint and seed produced in Tennessee for the period 1978-1987 was \$101,603,600. (10:54)

The Tennessee cotton industry has been on the increase since 1980. Acreage planted to cotton has increased from 250,000 acres in 1979 to 440,000 acres in 1987. Yield per acre (pounds of lint) has been erratic. Yields ranged from 337 pounds per acre in 1983, a drought year, to 700 pounds per acre in 1987. This yield from the 435,000 acres harvested produced 634,000 bales, the best production since 1964. (10:50)

*Numbers in parenthesis refer to alphabetically numbered references in the Bibliography; those after the colon are page numbers.

Tennessee cotton producers, like all other farmers, must be efficient managers. The Agricultural Extension Service has long known that in order to increase production efficiency, cotton producers must adopt certain recommended production practices.

The major concern of this study was to find out to what extent Tennessee cotton producers were using selected recommended cotton production practices and the extent to which these producers had been in contact with the Agricultural Extension Service. Efforts were also made to characterize Tennessee cotton producers farming operations and to determine the relationships between these farm characteristics and the producers use of recommended production practices.

II. NEED FOR THE STUDY

In 1987, cotton was the number one cash crop in Tennessee. Its profitability depends, however, on whether or not return from production is significantly above the cost of production.

Tennessee Extension agents know that not all cotton producers use all of the recommended production practices. There is a continuing need to teach and encourage the adoption of recommended cotton production practices. Net returns to cotton can be increased significantly through the application of recommended production practices at the proper time and in the proper sequence.

There existed a need to analyze data from the 1987 Tennessee Cotton Production Survey so that a determination might be made as to how to improve Extension Service programs and to, therefore, help cotton producers

become more efficient. It was felt that this study should serve as a basis for determining the need for educational programs of the Extension Service as they relate to cotton production.

III. PURPOSE OF THE STUDY

The purpose of this study was to determine the relationships between selected farming characteristics of Tennessee cotton growers, their Extension contacts, and their use of selected recommended cotton production practices.

The specific objectives were:

1. To characterize Tennessee cotton producers as to their farm operation, their Extension contacts and their use of selected recommended cotton production practices.
2. To determine the relationship between yield per acre and the producers use of selected recommended production practices.
3. To determine the relationship between the number of acres harvested and selected production practices used by Tennessee cotton producers.
4. To determine the relationship between the number of contacts cotton producers had with Extension over a 12 month period and their use of selected recommended cotton production practices.

IV. LIMITATIONS OF THE STUDY

This study was limited to the analysis of data available from the 1987 Tennessee Cotton Production Survey in November 1987.

The data were obtained by Extension agents through personal interviews with 243 cotton growers in 13 major cotton producing counties in Tennessee.

The counties included in this study were Crockett, Dyer, Fayette, Gibson, Hardeman, Haywood, Lake, Lauderdale, Madison, Shelby, and Tipton in West Tennessee. Other counties were Lincoln and Franklin in Middle Tennessee.

V. METHODS AND PROCEDURES

Population and Sample

The population of this study included all cotton producers in 11 West Tennessee counties and 2 Middle Tennessee counties. Each county included had to be producing at least 2,500 acres of cotton annually. Data collected in the 1987 Tennessee Cotton Producing Survey were received from 243 producers in the 13 counties through personal interviews by Extension agents. Producers were selected using the "Nth" number technique.

Counties producing 2,500 to 10,000 acres annually interviewed 15 producers. Counties producing 10,000 to 25,000 acres annually interviewed 20 producers. Counties producing over 25,000 acres annually interviewed 25 producers.

Survey Instrument

The survey instrument used to extract data from each producer was the 1987 Tennessee Cotton Production Survey. This instrument was developed by the University of Tennessee Agricultural Extension

Specialists and staff in the Plant and Soil Science and Agricultural and Extension Education Departments. The instrument was designed to be used in personal interviews with producers by agents.

Questions dealt primarily with the use of production and marketing practices, the number and type of contact producers had with Extension agents, size of the cotton operation, and personal data.

Interviews

Interviews were conducted by agents in cotton producing counties in November 1987.

Analysis of Data

Data on cotton producers in 1987 were processed for computer analysis. Computation and statistical analysis were made using the University of Tennessee Computing Center facilities and the SPSS-X statistical package.

Answers to the survey questions were summarized using means and frequency counts of the responses from the producers regarding their use of selected production practices, the total number of acres harvested, and the mean yields per acre of cotton.

The chi square test and one-way analysis of variance were used to determine the relationship between dependent and independent variables. Statistical tables were used to determine the significance of the observed relationships. F-values and x^2 values achieving the .05 level of probability were judged to be significant.

VI. DEFINITION OF TERMS

1. County Extension Program. Every county in Tennessee has a county Extension program. All Extension work done in the county, including but not limited to, planning, evaluation, and reporting progress is made toward annual (POA) plans and four-year (POWP) objectives and goals. Each county Extension program disseminates information on Agriculture, Home Economics, 4-H (Youth), and Community Resource Development.
2. Number of Extension Contacts. This is the total number of contacts producers had with Extension in the past 12 months. It includes the number of Extension meetings attended, number of farm visits received, number of Extension office visits made, and the number of telephone calls made to the Extension office in the past 12 month period.
3. Cotton Producer. The individual responsible for earning all or part of their agricultural income from the production and sale of cotton. They constitute the target audience of this study.
4. Practice. A research verified and commonly accepted procedure or task, which, if performed correctly and on a regular basis, will increase or help insure a desired outcome or return.
5. Dependent Variable. The variable which one wishes to explain as a function of other variables.
6. Independent Variable. The explanatory variable in a statistical analysis.
7. Cotton Yield. The actual pounds of lint cotton after seeds and trash are removed by ginning. Four hundred eighty pounds equal one bale.

CHAPTER II

REVIEW OF RELATED STUDIES

There have not been many studies made in Tennessee on the general production practices of cotton producers, their use of recommended cotton production practices, and the number of contacts they had with Extension agents. There have been, however, several studies of producers of other crops and livestock completed in Tennessee.

Summaries of other study findings are reported under the following headings:

1. Relationships between characteristics of farming operations and Extension contacts.
2. Relationship between the number of Extension contacts and use of recommended practices.
3. Relationship between characteristics of farming operations and use of recommended practices.

I. RELATIONSHIPS BETWEEN CHARACTERISTICS OF THE FARMING OPERATIONS AND EXTENSION CONTACTS

Yabaya, in a 1978 study of Tennessee corn producers found that corn producers who had more contact with Extension had significantly more acreage and yield for both silage and grain than did producers who had fewer Extension contacts. (12)

Gordon, in a 1977 study of Tennessee feeder pig producers found that the characteristics of the general farm operation did not significantly influence the number of contacts the producers had with Extension with the exception of the variable of "planning to increase the size of operation." (4)

McLemore, in a 1975 study of Tennessee swine producers, found that the number of sows farrowing twice per year and the number of pigs raised to weaning were significantly related to the number of contacts between the producers and Extension. (7)

Parker, in a 1983 study of Lauderdale County tomato producers, related that the number of contacts producers had with Extension was not significantly related to the producer's major source of income. He also found that the number of acres planted was not significantly related as to where farmers got their information. (9)

Arnett, in a 1973 study, found that the number of visits to the Extension office was significantly related to farm size. (1)

II. RELATIONSHIP BETWEEN THE NUMBER OF EXTENSION CONTACTS AND USE OF RECOMMENDED PRACTICES

McLemore found that the total number of contacts producers had with Extension was significantly related to their use of 23 of the 25 practices surveyed. (7)

According to Gordon's study, Haywood County swine producers who were using recommended practices made more contacts with Extension than did those producers who were not using the practices. (4)

Parker found that 8 of the 11 recommended production practices were related to at least one of the methods of Extension contacts studied. The practice of applying fertilizer by soil test was found to be significantly related to all methods of Extension contacts with the exception of the number of tomato production and marketing meetings attended. (9)

Bradley, in a 1980 study, compared the relationship of 9 recommended cotton production practices and the number and type of contacts the cotton producers had with Extension. His study showed a significant relationship in 20 of the 54 possible relationships. (2)

III. RELATIONSHIP BETWEEN CHARACTERISTICS OF FARMING OPERATIONS AND USE OF RECOMMENDED PRACTICES

Freeman, in a 1978 study, reported that Grade A dairymen with large farms and large dairy herds used significantly more recommended practices than those dairymen with smaller farms and herds. (3)

Jenkins' study found that larger soybean producers who farmed larger acreage had a significantly larger number of Extension contacts than did those producers farming smaller acreage. He also showed that the larger producers also were using more recommended practices than were the smaller acreage producers. (5)

Bradley's study revealed a significant relationship between the number of recommended practices used and the mean yield per acre. Cotton yield per acre consistently increased with an increase in the number of recommended practices used. Bradley showed that cotton

producers who used all 9 of the recommended cotton production practices had the highest yield of any group studied. (2)

Wilson and Gallup, USDA 1955, conducted research related to education nationwide. They found a significant relationship between the size of farm and the number of recommended practices used by farmers. Larger acreage farmers used more recommended practices than those with smaller acreage farms. (11)

CHAPTER III

STUDY FINDINGS

The findings of this study are summarized in four tables and discussed in the four sections within this chapter. Selected variables are discussed under subheadings within each of the sections.

Section I presents the findings regarding the characteristics of cotton production in Tennessee. Section II presents findings regarding the relationships between the use of selected production practices and mean yield per acre. Section III presents information concerning the relationship between the number of acres harvested and selected production practices used by Tennessee cotton producers. Section IV presents the findings regarding relationships between the total number of Extension contacts and selected production practices used by Tennessee cotton producers.

I. CHARACTERISTICS OF COTTON PRODUCTION IN TENNESSEE

Table 1 presents findings regarding those variables which characterize cotton production in Tennessee. The number and percent of producers responding are used to summarize the findings pertaining to each variable.

Variety

The variables included in this subsection are (1) variety planted, and (2) number of varieties planted.

Table 1. Characteristics of Cotton Production in Tennessee

Variable Name	Number of Producers Responding N=243*	Percent of Producers
VARIETY		
Variety Planted		
Deltapine 55	90	37.0
McNair 235	22	9.0
Stoneville 506	25	10.3
Stoneville 825	75	30.9
Other	31	12.8
TOTAL	243	100.0
Number of Varieties Planted		
1	78	32.1
2	82	33.7
3-Over	83	34.2
TOTAL	243	100.0
SEEDBED PREPARATION AND SEED TREATMENT		
Major Equipment Used		
Moldboard Plow	12	4.9
Disk	15	6.2
Chisel Plow	32	13.2
Combination	177	72.8
Other	7	2.9
TOTAL	243	100.0
Number of Times Land Tilled		
1-4	143	59.3
5-Over	98	40.7
TOTAL	241	100.0
Used Certified Seed		
Not Any	4	1.7
Part	23	9.6
All	212	88.7
TOTAL	239	100.0
PLANTING DATES		
Acres Planted April 20-May 10		
No	6	2.5
Yes	237	97.5
TOTAL	243	100.0
Acres Planted Before April 20		
No	215	88.5
Yes	28	11.5
TOTAL	243	100.0
Acres Planted After May 10		
No	169	69.5
Yes	74	30.5
TOTAL	243	100.0
SEED TYPE PLANTED		
Drilled--Machine-Delinted Seed		
No	236	97.1
Yes	7	2.9
TOTAL	243	100.0
Drilled--Acid-Delinted Seed		
No	18	7.4
Yes	225	92.6
TOTAL	243	100.0

Table 1. (Continued)

Variable Name	Number of Producers Responding N=243*	Percent of Producers
Hill Dropped--Machine-Delinted Seed		
No	216	88.9
Yes	27	11.1
TOTAL	243	100.0
Hill Dropped--Acid-Delinted Seed		
No	230	94.7
Yes	13	5.3
TOTAL	243	100.0
METHOD OF PLANTING		
Drilled		
No	14	5.8
Yes	229	94.2
TOTAL	243	100.0
Hill-Dropped		
No	230	94.7
Yes	13	5.3
TOTAL	243	100.0
Replanted		
No	228	93.8
Yes	15	6.2
TOTAL	243	100.0
SEEDLING DISEASE CONTROL		
Used Seed Treatment		
No	2	0.8
Yes	241	99.2
TOTAL	243	100.0
Type Machine Used--Seed		
Fungicide Only	12	5.1
Fungicide Plus Insecticide	224	94.9
TOTAL	236	100.0
Soil Treatment Used		
No	140	58.0
Yes	102	42.0
TOTAL	242	100.0
Fungicide Only--Soil		
No	130	81.8
Yes	29	18.2
TOTAL	159	100.0
Fungicide Plus Insecticide--Soil		
No	82	48.8
Yes	86	51.2
TOTAL	168	100.0
Method Used--Soil		
Hopper-Box Dust	13	12.3
In-Furrow	93	87.7
TOTAL	106	100.0
DISEASES		
Verticillium Wilt--Was This A Problem?		
No Problem	209	86.4
Part Of Crop	33	13.6
TOTAL	242	100.0

Table 1. (Continued)

Variable Name	Number of Producers Responding N=243*	Percent of Producers
Used Wilt-Resistant Variety		
No	111	48.1
Yes	121	51.9
TOTAL	242	100.0
FERTILIZATION		
Fertilized According to Soil Test		
No	84	34.6
Yes	159	65.4
TOTAL	243	100.0
Limed By Soil Test		
No	134	55.1
Yes	109	44.9
TOTAL	243	100.0
Pounds of Nitrogen Applied Per Acre- Upland		
75 Pounds or Less	55	22.6
76-85 Pounds	58	23.9
86-Over Pounds	130	53.5
TOTAL	243	100.0
Pounds of Nitrogen Applied Per Acre- Bottomland		
Under 60 Pounds	46	18.9
60 Pounds	54	22.3
61-Over Pounds	153	58.8
TOTAL	243	100.0
Pounds of Phosphate/Acre Without Soil Test		
20-60 Pounds	112	65.9
61-Over Pounds	58	34.1
TOTAL	170	100.0
Pounds of Potash/Acre Without Soil Test		
12-59 Pounds	23	13.6
60-165 Pounds	66	38.8
166-Over Pounds	81	47.6
TOTAL	170	100.0
Pounds of Boron/Acre Without Soil Test		
Not Any	99	40.7
1 Pound	77	31.7
3 Pounds	24	9.9
4 Pounds	43	17.7
TOTAL	243	100.0
WEED CONTROL		
Used Rotation With Corn or Soybeans to Control Weeds		
No	56	23.0
Yes	187	77.0
TOTAL	243	100.0
Used Rotary Hoeing		
No	231	95.5
Yes	11	4.5
TOTAL	242	100.0
Used Cultivation		
No	4	1.7
Yes	239	98.3
TOTAL	243	100.0

Table 1. (Continued)

Variable Name	Number of Producers Responding N=243*	Percent of Producers
Applied Preplant Chemical to Control Weeds		
No	39	16.0
Yes	204	84.0
TOTAL	243	100.0
Applied Pre-emergence Chemical to Control Weeds		
No	33	13.6
Yes	210	86.4
TOTAL	243	100.0
Applied Post-directed Chemical to Control Weeds		
No	109	44.9
Yes	134	55.1
TOTAL	243	100.0
Major Weed Problem		
Grass	31	12.9
Broadleaf	210	87.1
TOTAL	241	100.0
INSECT CONTROL		
Aphids		
Control Not Needed	181	75.1
Control Needed	60	24.9
TOTAL	241	100.0
Stink Bugs		
Control Not Needed	213	88.7
Control Needed	27	11.3
TOTAL	240	100.0
Cutworms		
Control Not Needed	236	97.9
Control Needed	5	2.1
TOTAL	241	100.0
Plant Bugs		
Control Not Needed	108	44.6
Control Needed	134	55.4
TOTAL	242	100.0
Thrips		
Control Not Needed	118	49.0
Control Needed	123	51.0
TOTAL	241	100.0
Whitefly		
Control Not Needed	234	97.5
Control Needed	6	2.5
TOTAL	240	100.0
Boll Weevil		
Control Not Needed	149	62.1
Control Needed	91	37.9
TOTAL	240	100.0
Boll Worm		
Control Not Needed	116	47.9
Control Needed	126	52.1
TOTAL	242	100.0

Table 1. (Continued)

Variable Name	Number of Producers Responding N=243*	Percent of Producers
Boll Worm Eggs		
Control Not Needed	169	70.1
Control Needed	72	29.9
TOTAL	241	100.0
Spider Mites		
Control Not Needed	232	96.3
Control Needed	9	3.7
TOTAL	241	100.0
Used Boll Weevil Diapause Control		
No	237	98.3
Yes	4	1.7
TOTAL	241	100.0
Insect Scouting Method Used		
Paid Scout	69	28.6
Personal Observation	162	67.3
Other	10	4.1
TOTAL	241	100.0
Frequency of Insect Scouting		
Under Once Per Week	59	25.0
Once Per Week	151	64.0
Over Once Per Week	26	11.0
TOTAL	236	100.0
DEFOLIATION		
Used Chemical Defoliation		
No	53	21.9
Yes	189	78.1
TOTAL	242	100.0
Percent of Bolls Open When Defoliant Applied		
Under 50	28	11.5
50-Over	215	88.5
TOTAL	243	100.0
HARVESTING		
Own a Cotton Picker		
No	51	21.0
Yes	192	79.0
TOTAL	243	100.0
Do Custom Picking		
No	159	78.7
Yes	43	21.3
TOTAL	202	100.0
Total Acres Harvested		
Under 100	61	25.2
100-199	39	16.0
200-Over	143	58.8
TOTAL	243	100.0
Pounds of Lint Per Acre		
Under 480 Pounds	9	3.7
480-959 Pounds	201	82.7
960-Over Pounds	33	13.6
TOTAL	242	100.0

Table 1. (Continued)

Variable Name	Number of Producers Responding N=243*	Percent of Producers
EXTENSION CONTACTS		
Number of Cotton Meetings Attended		
Not Any	69	28.4
1-Over	174	71.6
TOTAL	243	100.0
Number of Other Meetings Attended		
Not Any	59	24.3
1	60	24.7
2	67	27.6
3	33	13.5
4-Over	24	9.9
TOTAL	243	100.0
Number of Visits to Extension Office		
Not Any	64	26.3
1	29	11.9
2	28	11.5
3	24	9.9
4-Over	98	40.4
TOTAL	243	100.0
Number of Telephone Calls to Extension Office		
Not Any	39	16.0
1	31	12.8
2	34	14.0
3	19	7.8
4-Over	120	49.4
TOTAL	243	100.0
Number of Farm Visits Received From Extension Agents		
Not Any	37	15.3
1	29	11.9
2	38	15.6
3	30	12.3
4-Over	109	44.9
TOTAL	243	100.0

*Totals may not equal 243 due to non-responses to the question.

Variety planted. Data in Table 1 show that 37.0 percent of the 243 producers planted Deltapine 55 variety while 30.9 percent planted Stoneville 825 and 10.3 percent of the producers planted Stoneville 506. McNair 235 was planted by 9.0 percent of the producers. Thirty-one producers (12.8 percent) planted some other variety.

Number of varieties planted. Of the 243 producers surveyed, 34.2 percent planted 3 or more varieties while 2 varieties were planted by 33.7 percent of the producers. The planting of only one variety was reported by 32.1 percent of the producers.

Seedbed Preparation and Seed Treatment

The variables in this subsection are: (1) major equipment used, (2) number of times land tilled, and (3) used certified seed.

Major equipment used. Only 4.9 percent of the producers surveyed used the moldboard plow alone to prepare the seedbed. The disk was reported used by 6.2 percent of the producers and the chisel plow by 13.2 percent. A combination of equipment was used for seedbed preparation by 72.8 percent of the respondents. Of the respondents, only 2.9 percent used some other piece of equipment.

Number of times land tilled. Tilling 1 to 4 times was reported by 59.3 percent and 5 or more tillage trips were reported by 40.7 percent of the producers.

Used certified seed. Certified seed was used on all cotton acreage by 88.7 percent of the producers. Certified seed was used on part

of the crop by 9.6 percent and on none of the acreage by only 1.7 percent of the producers.

Planting Dates

The variables in this subsection are: (1) planted April 20-May 10, (2) planted before April 20, and (3) planted after May 10.

Planted April 20-May 10. Of the 243 producers surveyed, 97.5 percent planted between April 20 and May 10 while only 2.5 percent did not plant any cotton during this time.

Planted before April 20. Of the 243 producers, 88.5 percent did not plant any cotton before April 20 compared to 11.5 percent who did.

Planted after May 10. Planting after May 10 was reported by 30.5 percent of the 243 producers. No planting after this date was reported by 69.5 percent of the producers.

Seed Type Planted

The variables listed in this subsection are: (1) drilled--machine-delinted seed, (2) drilled--acid-delinted seed, (3) hill dropped--machine-delinted seed, and (4) hill dropped--acid-delinted seed.

Drilled--machine-delinted seed. Drilling machine-delinted seed was not used by 97.1 percent of the producers compared to only 2.9 percent of the producers using this practice.

Drilled--acid-delinted seed. Drilling acid-delinted seed was used by 92.6 percent of the 243 producers while only 7.4 percent did not use the practice.

Hill dropped--machine delinted seed. Hill dropping machine-delinted seed was reportedly used by only 11.1 percent of the producers while 88.9 percent did not.

Hill dropped--acid-delinted seed. Of the 243 producers, 94.7 percent did not hill drop acid-delinted seed compared to only 5.3 percent who did.

Method of Planting

The variables included in this subsection are: (1) drilled, (2) hill dropped, and (3) replanted.

Drilled. Fourteen producers (5.8 percent) indicated that they had no drilled acreage. Cotton was drilled by 94.2 percent of the producers.

Hill dropped. Hill dropping seed was not used by 94.7 percent of the 243 respondents compared to only 5.3 percent of the producers reporting using the practice.

Replanted. Replanting was not used by 93.8 percent of those surveyed. Fifteen (6.2 percent) of the producers did replant cotton.

Seedling Disease Control

The variables included in this subsection are: (1) used seed treatment, (2) type material used--seed, (3) used soil treatment, (4) used soil treatment-fungicide only, (5) used soil treatment-fungicide plus insecticide, and (6) used soil treatment-method used.

Used seed treatment. Two hundred forty-one (99.2 percent) indicated that seed treatment was used, while only 0.8 percent of the producers did not use seed treatment.

Type material used--seed. Almost 95 percent of the producers used a fungicide plus insecticide, while 5.1 percent reported use of fungicide only.

Used soil treatment. Soil treatment was not used by 58.0 percent of the producers. The practice was reportedly used by 42.0 percent.

Used soil treatment-fungicide only. Only 18.2 percent of the 159 producers responding used a fungicide only, compared to 81.8 percent who responded they did not use fungicide by itself.

Used soil treatment-fungicide plus insecticide. Of the 168 responses, 51.2 percent reported using fungicide plus insecticide while 48.8 percent did not.

Method used for soil treatment. Hopper-box dust was used by 12.3 percent of those surveyed while 87.7 percent reported use of an in-furrow application.

Diseases

The variables included in this subsection include (1) verticillium wilt--was this a problem, and (2) used wilt resistant variety.

Verticillium wilt--was this a problem?. Verticillium wilt was reported to be a problem for 13.6 percent of the 242 respondents compared to 86.4 percent who indicated it was not a problem.

Used wilt-resistant variety. Of the 242 producers responding, 48.1 percent indicated they did not use a wilt-resistant variety while 51.9 percent did.

Fertilization

The variables in this subsection are: (1) fertilized according to soil test, (2) limed by soil test, (3) pounds of nitrogen applied per acre-upland, (4) pounds of nitrogen applied per acre-bottomland, (5) pounds of phosphate per acre without soil test, (6) pounds of potash per acre without soil test, and (7) pounds of boron per acre without soil test.

Fertilized according to soil test. Of the 243 producers, 34.6 percent indicated they did not fertilize according to soil test. The remainder, 65.4 percent, did fertilize according to a soil test.

Limed by soil test. This practice was followed by 44.9 percent of the producers while the majority (55.1 percent) did not lime by soil test.

Pounds of nitrogen applied per acre-upland. Seventy-five pounds or less of nitrogen was applied by 22.6 percent of those responding. Just under 24 percent reported applying 76-85 pounds, while 53.5 percent applied 86 or more pounds of nitrogen.

Pounds of nitrogen applied per acre-bottomland. Less than 60 pounds of nitrogen was applied by 18.9 percent of the producers, while 22.3 percent applied 60 pounds and 58.8 percent of the respondents used 61 or more pounds per acre.

Pounds of phosphate per acre without soil test. The majority of producers (65.9 percent) applied between 20 and 60 pounds phosphate

per acre compared to 34.1 percent reporting they used 61 or more pounds of phosphate per acre.

Pounds of potash per acre without soil test. Only 13.6 percent of the 170 respondents applied 12-59 pounds of potash. Over 38 percent applied 60-165 pounds while 47.6 percent of the producers applied at least 166 pounds of potash per acre.

Pounds of boron per acre without soil test. Boron was not applied without a soil test by almost 41 percent of those surveyed. One pound was used by 31.7 percent, 3 pounds by 9.9 percent, while 17.7 percent of the producers applied 4 pounds without a soil test.

Weed Control

The variables included in this subsection are: (1) used rotation with corn or soybeans to control weeds, (2) used rotary hoeing, (3) used cultivation, (4) applied preplant chemical to control weeds, (5) applied pre-emergence chemical to control weeds, (6) applied post-directed chemical to control weeds, and (7) major weed problem.

Used rotation with corn or soybeans to control weeds. Seventy-seven percent of the producers used crop rotation to control weeds while 23 percent did not.

Used rotary hoeing. Rotary hoeing was not used as a weed control measure by 95.5 percent of the respondents. Only 4.5 percent used rotary hoeing for weed control.

Used cultivation. The vast majority of producers (98.3 percent) used cultivation for weed control compared to 1.7 percent who indicated it was not used.

Applied preplant chemical to control weeds. Sixteen percent reported that preplant chemicals were not used. The practice was used by 84 percent of the producers.

Applied pre-emergence chemicals to control weeds. The use of pre-emergence chemicals was reported by 86.4 percent of those surveyed while only 13.6 percent indicated no use.

Applied post-directed chemical to control weeds. The majority of producers (55.1 percent) applied a post-directed chemical to control weeds and the remainder (44.9 percent) did not.

Major weed problem. Broadleaf weeds were reported to be the major weed problem by 87.1 percent while grass was the major problem for 12.9 percent of the producers.

Insect Control

The variables included in this subsection are: (1) aphids, (2) stink bugs, (3) cutworms, (4) plant bugs, (5) thrips, (6) whitefly, (7) boll weevil, (8) boll worm, (9) boll worm eggs, (10) spider mites, (11) used boll weevil diapause control, (12) insect scouting method used, and (13) frequency of insect scouting.

Aphids. Over 75 percent of the producers reported that control for aphids was not needed while just under 25 percent reported that control was needed.

Stink bugs. Almost 89 percent of the producers said control was not needed for stink bugs while just over 11 percent reported that control was needed.

Cutworms. Cutworm control was not necessary for 97.9 percent of those surveyed. Only 2.1 percent reported that control was necessary.

Plant bugs. The use of a control measure for plant bugs was not needed by 44.6 percent of the producers, while control was required for 55.4 percent.

Thrips. Control for thrips was not necessary for 49 percent of the respondents. Control was necessary for the other 51 percent of the producers.

Whitefly. The majority of the producers (97.5 percent) said that whitefly control was not needed. Only 2.5 percent indicated that control was needed.

Boll weevil. Boll weevil control was not needed by 62.1 percent of those surveyed while 37.9 percent reported that control was needed.

Boll worm. Control for boll worms was reported not to be necessary by 47.9 percent of those responding. Control was needed for the other 52.1 percent.

Boll worm eggs. Over 70 percent of those responding reported that control for boll worm eggs was not required. Just under 30 percent of the producers did require a control.

Spider mites. Over 96 percent indicated that spider mite control was not needed while only approximately 4 percent indicated that control was needed.

Used boll weevil diapause control. Less than 2 percent of those surveyed used a boll weevil diapause control program. More than 98 percent indicated that such a program was not used.

Insect scouting method used. The majority of producers (67.3 percent) reported using personal observation while 28.6 percent used a paid scout. Some other method of scouting was reported by 4.1 percent.

Frequency of insect scouting. Scouting once per week was reported by 64 percent of those surveyed. Scouting less than once per week was indicated by 25 percent while only 11 percent scouted at a frequency greater than once per week.

Defoliation

Variables found in this subsection include: (1) used chemical defoliation, and (2) percent of bolls open when defoliant applied.

Used chemical defoliation. Less than 22 percent of the producers reported that chemical defoliation was not used while 78.1 percent used the practice.

Percent of bolls open when defoliant applied. The majority of producers (88.5 percent) reported 50 percent or more bolls open at application. Defoliant was applied with less than 50 percent of the bolls open by 11.5 percent of producers.

Harvesting

Variables included in this subsection are: (1) own a cotton picker, (2) do custom picking, (3) total acres harvested, and (4) pounds of lint per acre.

Own a cotton picker. Only 21 percent of those responding said they did not own a cotton picker. Ownership of a cotton picker was reported by 79 percent.

Do custom picking. Almost 79 percent of the producers did not do custom picking while only 21.3 percent did.

Total acres harvested. The majority of those surveyed (58.8 percent) reported harvesting 200 or more acres. Just over 25 percent reported harvesting under 100 acres while 16.0 percent harvested between 100 and 199 acres.

Pounds of lint per acre. The majority of producers (82.7 percent) reported a yield of 480 to 959 pounds of lint per acre. A yield of less than 480 pounds was reported by only 3.7 percent of the producers while 13.6 percent reported a yield of 960 pounds or more.

Extension Contacts

Variables found in this subsection are: (1) number of cotton meetings attended, (2) number of other meetings attended, (3) number of visits to Extension office, (4) number of telephone calls to Extension office, and (5) number of farm visits received from Extension agents.

Number of cotton meetings attended. The majority of producers (71.6 percent) attended at least one cotton meeting while 28.4 percent did not attend any.

Number of other meetings attended. Fifty-five (24.3 percent) of the cotton producers indicated they did not attend any meetings, 24.7 percent attended 1 meeting, and 27.6 percent reported attending 2 meetings. Three meetings were attended by 13.5 percent while only 9.9 percent of the producers said they attended 4 or more meetings.

Number of visits to Extension office. Several of those responding (40.4 percent) said that they had visited the Extension office 4 or more times, compared to 26.3 percent indicating they made no visits, 11.9 percent made 1 visit to the Extension office, 11.5 percent made 2 visits, and 3 visits were made by 9.9 percent.

Number of telephone calls to Extension office. Four or more calls were made by almost half (49.4 percent) of the producers. No calls to the Extension office were reported by 16 percent, 1 call by 12.8 percent, and 14 percent made 2 calls. Only 7.8 percent reported making 3 telephone calls.

Number of farm visits received from Extension agents. Four or more farm visits from Extension agents were received by 44.9 percent of those surveyed. Three visits were reported by 12.3 percent, 2 visits by 15.6 percent, 11.9 percent received 1 visit, while no visits were received by 15.3 percent of the producers.

Table Summary

Findings revealed that most producers planted at least two varieties of cotton. Certified seed was used by over 98 percent of the producers. Just under 98 percent of the producers planted at least part of their acreage between the recommended planting dates of April 20-May 10 and almost all producers used a seed treatment.

Over half of the producers fertilized by soil test while less than half limed by soil test. Most of the producers using chemical defoliation applied the defoliant when 50 percent or more of the bolls were open.

Almost 83 percent of the producers reported a yield of 480 to 959 pounds of lint per acre.

II. RELATIONSHIPS BETWEEN TENNESSEE COTTON PRODUCERS USE OF SELECTED COTTON PRODUCTION PRACTICES AND YIELD PER ACRE

Table 2 presents data indicating relationships between Tennessee cotton producers use of selected cotton production practices and yield per acre for 1987. The purpose for this analysis was to determine the relationship, if it exists, between selected production practices and yield per acre.

The analysis of variance F test was used to determine the strength of the relationship between the practices used and yields. F values which achieved the .05 probability level were considered significant.

Table 2. Relationships Between the Use of Selected Production Practices by Tennessee Cotton Producers and Yield Per Acre

Variable Name	Number Responding	Mean Yield Pounds Lint/Acre
VARIETY		
Variety Planted		
Deltapine 55	90	808.8
McNair 235	22	756.6
Stoneville 506	25	675.6
Stoneville 825	75	739.1
Other	31	752.4
TOTAL	243	762.0
Variance Ratio F = 3.75; p = 0.01		
Number of Varieties Planted		
1	77	752.5
2	82	741.7
3-Over	83	791.0
TOTAL	242	762.0
Variance Ratio F = 1.90; p = 0.15		
SEEDBED PREPARATION AND SEED TREATMENT		
Major Equipment Used		
Moldboard Plow	12	787.3
Disk	15	772.0
Chisel Plow	32	835.7
Combination	176	740.7
Other	7	898.0
TOTAL	252	762.0
Variance Ratio F = 3.50; p = 0.01		
Number of Times Land Tilled		
1-4	142	769.4
5-Over	98	754.0
TOTAL	240	762.0
Variance Ratio F = 0.80; p = 0.45		
Used Certified Seed		
No	4	650.0
Part	23	764.1
All	211	763.0
TOTAL	238	761.2
Variance Ratio F = 0.85; p = 0.43		
PLANTING DATES		
Acres Planted April 20-May 10		
No	6	596.7
Yes	236	766.2
TOTAL	242	762.0
Variance Ratio F = 5.88; p = 0.02		
Acres Planted Before April 20		
No	192	755.0
Yes	27	755.3
TOTAL	219	755.1
Variance Ratio F = 0.00; p = 0.99		
Acres Planted After May 10		
No	168	766.6
Yes	74	751.6
TOTAL	242	762.0
Variance Ratio F = 0.39; p = 0.53		
SEED TYPE PLANTED		
Drilled--Machine-Delinted Seed		
No	235	759.9
Yes	7	832.9
TOTAL	242	762.0
Variance Ratio F = 1.24; p = 0.27		

Table 2. (Continued)

Variable Name	Number Responding	Mean Yield Pounds Lint/Acre
Drilled--Acid-Delinted Seed		
No	17	737.2
Yes	225	763.9
TOTAL	242	762.0
Variance Ratio F = 0.38; p = 0.54		
Hill Dropped--Machine-Delinted Seed		
No	215	756.2
Yes	27	808.2
TOTAL	242	762.0
Variance Ratio F = 2.23; p = 0.14		
Hill Dropped--Acid-Delinted Seed		
No	230	764.9
Yes	12	707.8
TOTAL	242	762.0
Variance Ratio F = 1.28; p = 0.26		
METHOD OF PLANTING		
Drilled		
No	13	696.0
Yes	229	765.8
TOTAL	242	762.0
Variance Ratio F = 2.06; p = 0.15		
Hill Dropped		
No	230	765.2
Yes	12	702.0
TOTAL	242	762.0
Variance Ratio F = 1.56; p = 0.21		
Replanted		
No	227	765.9
Yes	15	704.1
TOTAL	242	762.0
Variance Ratio F = 1.85; p = 0.18		
SEEDLING DISEASE CONTROL		
Used Seed Treatment		
No	2	708.5
Yes	240	762.5
TOTAL	242	762.0
Variance Ratio F = 0.20; p = 0.66		
Type Material Used--Seed		
Fungicide Only	12	654.3
Fungicide Plus Insecticide	223	767.8
TOTAL	235	762.0
Variance Ratio F = 5.12; p = 0.02		
Used Soil Treatment		
No	139	728.2
Yes	102	808.8
TOTAL	241	762.3
Variance Ratio F = 13.7; p < 0.01		
Fungicide Only--Soil		
No	130	750.6
Yes	29	775.7
TOTAL	159	755.2
Variance Ratio F = 0.58; p = 0.45		
Fungicide Plus Insecticide--Soil		
No	82	713.2
Yes	86	817.8
TOTAL	168	766.7
Variance Ratio F = 19.4; p < 0.01		

Table 2. (Continued)

Variable Name	Number Responding	Mean Yield Pounds Lint/Acre
Method Used--Soil		
Hopper-Box Dust	13	773.8
In-Furrow	93	810.0
TOTAL	106	805.6
Variance Ratio F = 0.68; p = 0.41		
DISEASES		
Verticillium Wilt--Was This A Problem?		
No Problem	208	763.7
Part Of Crop	33	753.8
TOTAL	241	762.3
Variance Ratio F = 0.11; p = 0.76		
Used Wilt-Resistant Variety		
No	111	767.1
Yes	119	757.6
TOTAL	230	762.2
Variance Ratio F = 0.18; p = 0.67		
FERTILIZATION		
Fertilized According to Soil Test		
No	83	713.4
Yes	159	787.4
TOTAL	242	762.0
Variance Ratio F = 10.6; p < 0.01		
Limed By Soil Test		
No	133	733.8
Yes	109	796.4
TOTAL	242	762.0
Variance Ratio F = 8.28; p < 0.01		
Pounds of Nitrogen Applied Per Acre- Upland		
75 Pounds or Less	54	708.0
76-85 Pounds	58	767.5
86-Over Pounds	130	782.0
TOTAL	242	762.0
Variance Ratio F = 3.70; p = 0.03		
Pounds of Nitrogen Applied Per Acre- Bottomland		
Under 60 Pounds	45	708.7
60 Pounds	54	771.1
61-Over Pounds	143	775.4
TOTAL	242	762.0
Variance Ratio F = 2.74; p = 0.07		
Pounds of Phosphate Per Acre Without Soil Test		
20-60 Pounds	111	737.8
61-Over Pounds	58	755.4
TOTAL	169	743.8
Variance Ratio F = 0.40; p = 0.53		
Pounds of Potash Per Acre Without Soil Test		
12-59 Pounds	22	732.4
60-165 Pounds	66	730.1
166-Over Pounds	81	758.1
TOTAL	169	743.8
Variance Ratio F = 0.53; p = 0.59		
Pounds of Boron Per Acre Without Soil Test		
Not Any	98	769.4
1	77	772.9
3	24	824.4
4	43	690.8
TOTAL	242	762.0
Variance Ratio F = 3.85; p = 0.01		

Table 2. (Continued)

Variable Name	Number Responding	Mean Yield Pounds Lint/Acre
WEED CONTROL		
Used Rotation With Corn or Soybeans to Control Weeds		
No	56	744.3
Yes	186	767.4
TOTAL	242	762.0
Variance Ratio F = 0.78; p = 0.38		
Used Rotary Hoeing		
No	230	759.0
Yes	11	830.5
TOTAL	241	762.3
Variance Ratio F = 1.84; p = 0.18		
Used Cultivation		
No	4	663.3
Yes	238	763.7
TOTAL	242	762.0
Variance Ratio F = 1.36; p = 0.24		
Applied Preplant Chemical to Control Weeds		
No	39	756.7
Yes	203	763.1
TOTAL	242	762.0
Variance Ratio F = 0.05; p = 0.83		
Applied Pre-emergence Chemical to Control Weeds		
No	33	783.0
Yes	209	758.7
TOTAL	242	762.0
Variance Ratio F = 0.57; p = 0.45		
Applied Post-Directed Chemical to Control Weeds		
No	109	760.5
Yes	133	763.3
TOTAL	242	762.0
Variance Ratio F = 0.02; p = 0.90		
Major Weed Problem		
Grass	31	758.6
Broadleaf	209	763.7
TOTAL	240	763.1
Variance Ratio F = 0.02; p = 0.88		
INSECT CONTROL		
Aphids		
Control Not Needed	180	773.1
Control Needed	60	723.7
TOTAL	240	760.8
Variance Ratio F = 3.82; p = 0.05		
Stink Bugs		
Control Not Needed	212	767.4
Control Needed	27	711.3
TOTAL	239	761.1
Variance Ratio F = 2.60; p = 0.11		
Cutworms		
Control Not Needed	236	762.6
Control Needed	4	652.5
TOTAL	240	760.8
Variance Ratio F = 1.64; p = 0.20		
Plant Bugs		
Control Not Needed	108	753.3
Control Needed	133	767.4
TOTAL	241	761.1
Variance Ratio F = 0.40; p = 0.53		

Table 2. (Continued)

Variable Name	Number Responding	Mean Yield Pounds Lint/Acre
Thrips		
Control Not Needed	117	749.6
Control Needed	123	771.4
TOTAL	240	760.6
Variance Ratio F = 0.98; p = 0.32		
Whitefly		
Control Not Needed	233	762.5
Control Needed	6	672.3
TOTAL	239	760.3
Variance Ratio F = 1.63; p = 0.20		
Boll Weevil		
Control Not Needed	149	799.3
Control Needed	90	695.4
TOTAL	239	760.2
Variance Ratio F = 22.6; p < 0.01		
Boll Worm		
Control Not Needed	116	781.8
Control Needed	125	741.9
TOTAL	241	761.1
Variance Ratio F = 3.32; p = 0.07		
Boll Worm Eggs		
Control Not Needed	169	776.3
Control Needed	71	723.7
TOTAL	240	760.8
Variance Ratio F = 4.81; p = 0.03		
Spider Mites		
Control Not Needed	231	767.3
Control Needed	9	593.9
TOTAL	240	760.8
Variance Ratio F = 9.22; p = 0.03		
Used Boll Weevil Diapause Control		
No	237	766.2
Yes	3	408.3
TOTAL	240	761.7
Variance Ratio F = 13.70; p < 0.01		
Insect Scouting Method Used		
Paid Scout	69	827.8
Personal Observation	161	726.2
Other	10	829.2
TOTAL	240	759.7
Variance Ratio F = 10.27; p < 0.01		
Frequency of Insect Scouting		
Under Once Per Week	59	710.4
Once Per Week	150	788.5
Over Once Per Week	26	722.7
TOTAL	235	761.6
Variance Ratio F = 5.40; p = 0.01		
DEFOLIATION		
Used Chemical Defoliation		
No	53	715.2
Yes	188	774.0
TOTAL	241	761.1
Variance Ratio F = 5.00; p = 0.03		

Table 2. (Continued)

Variable Name	Number Responding	Mean Yield Pounds Lint/Acre
Percent of Bolls Open When Defoliant Applied		
Under 50	27	703.0
50-Over	215	769.4
TOTAL	242	762.0
Variance Ratio F = 3.67; p = 0.06		
HARVESTING		
Own a Cotton Picker		
No	50	746.3
Yes	192	766.1
TOTAL	242	762.0
Variance Ratio F = 0.53; p = 0.47		
Do Custom Picking		
No	159	769.9
Yes	43	750.2
TOTAL	202	765.7
Variance Ratio F = 0.52; p = 0.47		

Variety

The variables included in this subsection are: (1) variety planted, and (2) number of varieties planted.

Variety planted. Deltapine 55, grown by 90 producers (37.0 percent) yielded 808.8 pounds of lint per acre which was the highest yield of the varieties evaluated. Stoneville 506, grown by 25 (10.3 percent) producers had the lowest yield at 675.6 pounds of lint per acre. When tested by the analysis of variance F test, there was a significant relationship between the mean yield per acre and the variety planted.

Number of varieties planted. The 83 producers (34.3 percent) planting 3 or more varieties had a yield of 791.0 pounds of lint per acre. Eighty-two producers (33.8 percent) planting 2 varieties had a yield of 741.7 pounds of lint per acre. These differences were not significant at the .05 level of significance when tested by the F test. Therefore, the mean yield per acre was not significantly related to the number of varieties grown.

Seedbed Preparation and Seed Treatment

The variables included in this subsection include: (1) major equipment used, (2) number of times land tilled, and (3) used certified seed.

Major equipment used. The highest mean yield reported, 898.0 pounds of lint per acre, was achieved by 7 producers (2.8 percent) who used some "other" piece of equipment and 32 producers (21.0 percent)

who used the chisel plow (835.7 pounds of lint) for seedbed preparation. The lowest yield (740.7 pounds of lint per acre) was achieved by 176 producers (69.8 percent) using a combination of equipment. When tested by the F test, there was a significant relationship between the mean yield per acre and the major equipment used. Data seems to indicate that producers using a single piece of equipment had higher mean yields per acre than producers using a combination of equipment.

Number of times land tilled. The 142 producers (59.2 percent) who tilled the land 1-4 times had a mean yield of 769.4 pounds of lint per acre. The 98 producers (40.8 percent) who tilled 5 or more times had a mean yield of 754.0 pounds of lint per acre. The differences were not significant when tested by the analysis of variance F test. Therefore, mean yield per acre was not significantly related to the number of times land was tilled.

Used certified seed. The highest mean yield (764.1 pounds of lint per acre) was achieved by the 23 producers (9.7 percent) who planted part of crop with certified seed. The lowest yield, 650.0 pounds of lint per acre, was from 4 producers (1.7 percent) who did not plant any certified seed. The F test did not show a significant relationship at the .05 level between the use of certified seed and mean yield per acre.

Planting Dates

The variables included in this subsection are: (1) planted April 20-May 10, (2) planted before April 20, and (3) planted after May 10.

Planted April 20-May 10. Six producers (2.5 percent) who did not plant in this period had a mean yield of 596.7 pounds of lint per acre. The 236 producers (97.5 percent) who planted in this time period received a mean yield of 766.2 pounds. When tested by the F test, the differences were significant. Mean yield was significantly related to the practice of planting April 20-May 10. Producers who planted during this period were more likely to have a higher mean yield per acre than those who did not.

Planted before April 20. One hundred ninety-two producers (87.7 percent) did not plant any cotton before April 20 and received a mean yield of 755.0 pounds of lint per acre. The 27 producers (12.3 percent) who planted before April 20 had a mean yield of 755.3 pounds of lint per acre. The differences were not significant when tested by the analysis of variance F test, consequently there was no significant relationship between the mean yield per acre and planting before April 20.

Planted after May 10. The one hundred sixty-eight producers (69.4 percent) who did not plant after May 10 had a mean yield of 766.6 pounds of lint per acre. The remaining 74 producers (31.6 percent) who did plant after May 10 had a mean yield of 751.6 pounds of lint per acre. There was no significant relationship between the mean yield and the practice of planting after May 10.

Seed Type Planted

The variables included in this subsection are: (1) drilled--machine-delinted seed, (2) drilled--acid-delinted seed, (3) hill dropped--machine-delinted seed, and (4) hill dropped--acid-delinted seed.

Drilled--machine-delinted seed. The 235 producers (97.1 percent) who did not drill machine-delinted seed had a mean yield of 759.9 pounds of lint per acre compared to the 7 producers (2.9 percent) who did drill machine-delinted seed and had a mean yield of 832.9 pounds of lint per acre. According to the F test, the differences were not significant at the .05 level. Thus, there was no significant relationship between the mean yield per acre and drilling machine-delinted seed.

Drilled--acid-delinted seed. Seventeen (7.0 percent) of the producers surveyed did not drill acid-delinted seed and had a mean yield of 737.2 pounds of lint per acre. The remaining 225 producers (93.0 percent) did drill acid-delinted seed and reported a mean yield of 763.9 pounds of lint per acre. The differences were not significant when analyzed by the F test. There was no significant relationship between the mean yield per acre and drilling acid-delinted seed.

Hill dropped--machine-delinted seed. The 215 producers (88.8 percent) who did not hill drop machine-delinted seed had a mean yield of 756.2 pounds of lint per acre. The 27 producers (11.2 percent) who did hill drop machine-delinted seed had a mean yield of 808.2 pounds of lint per acre. According to the analysis of variance F test, these

differences were not significant at the .05 level. Therefore, mean yield per acre was not significantly related to hill dropping machine-delinted seed.

Hill dropped--acid-delinted seed. Two hundred thirty producers (95.0 percent) did not hill drop acid-delinted seed. They had a mean yield of 764.9 pounds of lint per acre. The remaining 12 producers (5.0 percent) did hill drop acid-delinted seed. Their mean yield was 707.8 pounds of lint per acre. These differences are not significant and no significant relationship existed between the mean yield and hill dropping--acid-delinted seed.

Method of Planting

The variables found in this subsection include: (1) drilled, (2) hill dropped, and (3) replanted.

Drilled. Two hundred twenty-nine producers (94.6 percent) drilled their cotton acreage. Thirteen producers (5.4 percent) did not. Those drilling had a mean yield of 765.8 pounds of lint per acre while those not drilling had a mean yield of 696.0 pounds of lint per acre. There was no significant relationship between the mean yield per acre and the practice of drilling cotton seed.

Hill dropped. Twelve producers (4.9 percent) hill dropped their cotton acreage and had a mean yield of 702.0 pounds of lint per acre. Two hundred thirty producers did not hill drop their cotton seed and had a mean yield of 765.2 pounds of lint per acre. There was no

significant relationship at the .05 level of significance between the mean yield per acre and hill dropping cotton seed.

Replanted. Almost 94 percent (227 producers) did not replant any cotton acreage in 1987 and received a mean yield of 765.9 pounds of lint per acre. Fifteen producers (6.2 percent) did replant and had a mean yield of 704.1 pounds of lint per acre. No significant relationship existed between the mean yield per acre and replanting of cotton.

Seedling Disease Control

The variables included in this subsection are: (1) used seed treatment, (2) type material used--seed, (3) used soil treatment, (4) fungicide only--soil, (5) fungicide plus insecticide--soil, and (6) method used--soil.

Used seed treatment. Only 2 producers (0.8 percent) did not use a seed treatment of some type and their mean yield was 708.5 pounds of lint per acre. The remaining 240 producers, or 99.2 percent, used a seed treatment and had a mean yield of 762.5 pounds of lint per acre. According to analysis of variance F test there was no significant relationship between the mean yield per acre and producers use of seed treatment for disease control.

Type material used--seed. Only 12 producers (5.1 percent) used a fungicide only and reported a mean yield of 654.3 pounds of lint per acre. The remaining respondents, 223 producers, used a fungicide plus insecticide and had a mean yield of 767.8 pounds of lint per acre.

When tested by the $\underline{F}$ test, there was a significant relationship between the mean yield and the type of material used for seed treatment.

Producers who used a fungicide plus insecticide tended to have higher yields than those who did not.

Used soil treatment. One hundred thirty-nine producers, or 57.6 percent, did not use a soil treatment and had a mean yield of 728.2 pounds of lint per acre. One hundred two producers (42.4 percent) did use a soil treatment and had a mean yield of 808.8 pounds of lint per acre. According to the $\underline{F}$ test, the difference was significant at the .05 level of significance. Therefore, a significant relationship existed between the mean yield per acre and the use of a soil treatment. Producers who used a soil treatment for disease control were more likely to have higher yields.

Fungicide only--soil. One hundred thirty producers (81.7 percent) of the 159 responding to the question, did not use a fungicide only as a soil treatment and had a mean yield of 750.6 pounds of lint per acre. Twenty-nine producers (18.3 percent) used only a fungicide as a soil treatment and reported a mean yield of 775.7 pounds of lint per acre. The difference was not significant at the .05 level according to the analysis of variance $\underline{F}$ test. Therefore there was no significant relationship between the mean yield per acre and the producers use of a fungicide only for soil treatment.

Fungicide plus insecticide--soil. Of the 168 respondents, 82 producers (48.8 percent) did not use fungicide plus insecticide for soil

treatment. Their mean yield was 713.2 pounds of lint per acre. Eighty-six producers (51.2 percent) did use a fungicide plus insecticide for soil treatment and had a mean yield of 817.8 pounds of lint per acre. There was a significant relationship, according to the F test, between the mean yield per acre and the use of a fungicide plus insecticide for soil treatment. Producers who used fungicide plus insecticide for soil treatment were more likely to have higher yields than those who did not.

Method used--soil. Thirteen of the respondents (12.3 percent) used a hopper-box dust to apply the soil treatment and had a mean yield of 773.8 pounds of lint per acre. The remaining 93 respondents (87.7 percent) used an in-furrow application and had a mean yield of 810.0 pounds of lint per acre. According to the F test, there was no significant relationship between the mean yield per acre and the method used to apply a soil treatment.

Diseases

The variables included in this subsection are: (1) verticillium wilt--was this a problem?, and (2) used wilt-resistant variety.

Verticillium wilt--was this a problem?. Verticillium wilt was no problem for 208 or 86.3 percent of the producers. They had a mean yield of 763.7 pounds of lint per acre. It was reported to be a problem by the remaining 33 producers. Their mean yield was 753.8 pounds of lint per acre. According to the F test, there was no significant relationship between the mean yield per acre and the problem of verticillium wilt.

Used wilt-resistant variety. One hundred eleven producers (48.3 percent) of the 230 responding, did not use a wilt-resistant variety and had a mean yield of 767.1 pounds of lint per acre. The other 119 producers (51.7 percent) planted a wilt-resistant variety. Their mean yield was 757.6 pounds of lint per acre. According to the analysis of variance F test, no significant relationship existed between the mean yield and the use of a wilt-resistant variety.

Fertilization

The variables included in this subsection are: (1) fertilized according to soil test, (2) limed by soil test, (3) pounds of nitrogen applied per acre-upland, (4) pounds of nitrogen applied per acre-bottomland, (5) pounds of phosphate per acre without soil test, (6) pounds of potash per acre without soil test, and (7) pounds of boron per acre without soil test.

Fertilized according to soil test. Eighty-three producers (34.2 percent) did not fertilize according to soil test and had a mean yield of 713.4 pounds of lint per acre. One hundred fifty-nine producers (65.7 percent) did fertilize according to soil test and had a mean yield of 787.4 pounds of lint per acre. This difference was significant at the .05 level, when tested by the F test. Therefore, there was a significant relationship between the mean yield per acre and fertilizing according to soil test. Producers who fertilized according to soil test were more likely to have higher yields than those who did not.

Limed by soil test. Lime was not applied by a soil test by 133 producers (54.9 percent) who had a mean yield of 733.8 pounds of lint per acre. Lime was applied by soil test by 109 producers (45.1 percent) with a mean yield of 796.4 pounds of lint per acre. There was a significant relationship between the mean yield per acre and liming by soil test according to the F test. Producers who limed according to soil test tended to have higher yields than those who did not.

Pounds of nitrogen applied per acre-upland. Fifty-four producers (22.3 percent) applied 75 pounds of nitrogen or less and had a mean yield of 708.0 pounds of lint per acre. Fifty-eight producers (24.0 percent) applied 76-85 pounds of nitrogen per acre. Their mean yield was 767.5 pounds of lint per acre. One hundred thirty producers (53.7 percent) applied 86 or more pounds of nitrogen and received a mean yield of 782.0 pounds of lint per acre. When tested by the F test, there was a significant relationship between the mean yield per acre and the amount of nitrogen applied per acre-upland. Producers who applied higher rates of nitrogen per acre tended to have higher yields than those who applied lesser rates.

Pounds of nitrogen applied per acre-bottomland. Forty-five producers (18.6 percent) applied less than 60 pounds of nitrogen and had a mean yield of 708.7 pounds of lint per acre compared to the 54 producers (22.3 percent) who applied 60 pounds and received a mean yield of 771.1 pounds of lint per acre and the 143 producers (59.1 percent) who applied 61 or more pounds of nitrogen and received a mean yield of 775.4 pounds

of lint per acre. According to the F test, these differences were not significant, therefore, there was no significant relationship between the mean yield per acre and the amount of nitrogen applied per acre-bottomland.

Pounds of phosphate per acre without soil test. Between 20-60 pounds of phosphate was applied by the 111 producers (65.7 percent) of the 169 responding. They had a mean yield of 737.8 pounds of lint per acre. Fifty-eight producers (34.3 percent) applied 61 or more pounds of phosphate and had a mean yield of 755.4 pounds of lint per acre. There was no significant relationship, according to the analysis of variance F test, between the mean yield per acre and the amount of phosphate applied per acre without a soil test.

Pounds of potash per acre without soil test. Twenty-two producers (13.0 percent) of the 169 responding, applied 12-59 pounds of potash and had a mean yield of 732.4 pounds of lint per acre. Sixty-six producers (39.1 percent) applied 60-165 pounds of potash and received a mean yield of 730.1 pounds of lint per acre. The remaining 81 producers (47.9 percent) applied at least 166 pounds of potash and had a mean yield of 758.1 pounds of lint per acre. According to the analysis of variance F test, these differences are not significant at the .05 level, therefore, no significant relationship existed between the mean yield per acre and the amount of potash per acre without a soil test.

Pounds of boron per acre without soil test. No boron was applied by 98 producers (40.5 percent). They had a mean yield of 769.4 pounds of lint per acre. One pound was applied by 77 producers (31.8 percent) who had a mean yield of 772.9 pounds of lint per acre. Twenty-four producers, or 9.9 percent, applied 3 pounds of boron and had a mean yield of 824.4 pounds of lint per acre, while 43 producers (17.8 percent) applied 4 pounds and received a mean yield of 690.8 pounds of lint per acre. According to the analysis of variance F test, there was a significant relationship between the mean yield per acre and the amount of boron per acre without a soil test. Producers who applied 4 pounds of boron per acre without a soil test tended to have lower yields than all other groups.

Weed Control

The variables included in this subsection are: (1) used rotation with corn or soybeans to control weeds, (2) used rotary hoeing, (3) used cultivation, (4) applied preplant chemical to control weeds, (5) applied pre-emergence chemical to control weeds, (6) applied post-directed chemical to control weeds, and (7) major weed problem.

Used rotation with corn or soybeans to control weeds. Only 56 (23.1 percent) of the 242 producers responding did not use rotation to control weeds. They had a mean yield of 744.3 pounds of lint per acre. The remaining 186 producers did use rotation to another crop to control weeds and had a mean yield of 767.4 pounds of lint per acre. The differences were not significant at the .05 level when tested by

the F test. Therefore, the mean yield per acre was not significantly related to whether or not producers rotated cotton with corn or soybeans to control weeds.

Used rotary hoeing. Two hundred thirty producers (95.4 percent) did not use rotary hoeing to control weeds and had a mean yield of 759.0 pounds of lint per acre. Eleven producers (4.6 percent) did use rotary hoeing as a weed control measure and had a mean yield of 830.5 pounds of lint per acre. When tested by the F test, there was no significant relationship between the mean yield per acre and the use of rotary hoeing to control weeds.

Used cultivation. Only 4 producers (1.7 percent) did not use cultivation to control weeds and had a mean yield of 663.3 pounds of lint per acre compared to the 238 producers (98.3 percent) who did use cultivation to control weeds; who had a mean yield of 763.7 pounds of lint per acre. According to the analysis of variance F test, the differences were not significant at the .05 level. Thus, the mean yield per acre was not significantly related to the use of cultivation to control weeds. Producers who used cultivation to control weeds were no more likely to have increased mean yields per acre over those who did not.

Applied preplant chemical to control weeds. Thirty-nine producers (16.1 percent) did not apply preplant chemicals for weed control. They had a mean yield of 756.7 pounds of lint per acre. The 203 producers who did apply preplant chemicals had a mean yield of 763.1

pounds of lint per acre. According to the analysis of variance F test, there was no significant relationship between the mean yield per acre and the practice of applying preplant chemical to control weeds.

Applied pre-emergence chemical to control weeds. Thirty-three producers (13.6 percent) did not apply pre-emergence chemical and received a mean yield of 783.0 pounds of lint per acre. Two hundred nine producers applied pre-emergence chemical and had a mean yield of 758.7 pounds of lint per acre. There was no significant relationship, when tested by the F test, between the mean yield per acre and the practice of applying pre-emergence chemical to control weeds.

Applied post-directed chemical to control weeds. No post-directed chemical was applied by 109 producers (45.0 percent). They had a mean yield of 760.5 pounds of lint per acre. The remaining 133 producers applied post-directed chemical and received a mean yield of 763.3 pounds of lint per acre. According to the F test, there was no significant relationship between the mean yield per acre and the practice of applying post-directed chemical to control weeds.

Major weed problem. Grass was the major weed problem for 31 (12.9 percent) of the producers who reported having a mean yield of 758.6 pounds of lint per acre. Broadleaf weeds were the major problem for 209 (87.1 percent) of the producers. Their mean yield was 763.7 pounds of lint per acre. According to the F test, there was no significant relationship between the mean yield per acre and the type of major weed problem reported by the producers.

Insect Control

The variables found in this subsection are: (1) aphids, (2) stink bugs, (3) cutworms, (4) plant bugs, (5) thrips, (6) whitefly, (7) boll weevil, (8) boll worm, (9) boll worm eggs, (10) spider mites, (11) used boll weevil diapause control, (12) insect scouting method used, and (13) frequency of insect scouting.

Aphids. One hundred eighty producers (75.0 percent) did not need a control for aphids. The mean yield was 773.1 pounds of lint per acre. Sixty producers did need a control for aphids and had a mean yield of 723.7 pounds of lint per acre. When tested by the F test, there was a significant relationship between the mean yield and the need for control of aphids. Producers who did not need to control aphids tended to have higher mean yields per acre than those who did.

Stink bugs. Stink bug control was not needed for 212 (88.7 percent) of the producers responding. They reported a mean yield of 767.4 pounds of lint per acre while the 27 producers who did report a need for stink bug control had a mean yield of 711.3 pounds of lint per acre. According to the F test, there was no significant relationship between the mean yield per acre and the need for stink bug control.

Cutworms. Cutworm control was not needed by 236 (98.3 percent) of the producers responding. This group had a mean yield of 762.6 pounds of lint per acre. The 4 producers who did need a control had a mean yield of 652.5 pounds of lint per acre. According to the F test, no significant relationship existed between the mean yield per acre and the need for cutworm control.

Plant bugs. One hundred eight of the 241 producers (44.8 percent) did not need a control for plant bugs and had a mean yield of 753.3 pounds of lint per acre while the 133 producers (55.2 percent) who did need to control plant bugs received a mean yield of 767.4 pounds of lint per acre. When tested by the F test, there was no significant relationship between the mean yield per acre and the need for plant bug control.

Thrips. Thrips control was not needed by 117 producers (48.8 percent) who had a mean yield of 749.6 pounds of lint per acre while the 123 producers (51.2 percent) who did need to control thrips had a mean yield of 771.4 pounds of lint per acre. According to the analysis of variance F test, there was no significant relationship between the mean yield per acre and the need for control of thrips.

Whitefly. A mean yield of 762.5 pounds of lint was obtained by the 233 producers (97.5 percent) who did not need a control for whiteflies. The 6 producers who did report a need for whitefly control had a mean yield of 672.3 pounds of lint per acre. There was not a significant relationship, according to the F test, between the mean yield per acre and the need for whitefly control.

Boll weevil. One hundred forty-nine producers (62.3 percent) reported no need to control boll weevils and had a mean yield of 799.3 pounds of lint per acre. Ninety producers (37.7 percent) reported a need for control of boll weevils and had a mean yield of 695.4 pounds of lint per acre. According to the analysis of variance F test, there

was a significant relationship. Producers who did not need to treat for boll weevils tended to have a higher mean yield per acre than those who did need to treat.

Boll worm. Boll worm control was not necessary for 116 (48.1 percent) of the producers who had a mean yield of 781.8 pounds of lint per acre. Compare this to the 125 (51.9 percent) producers who did need to control boll worms and had a mean yield of 741.9 pounds of lint per acre. According to the F test, there was no significant relationship between the mean yield per acre and the need for boll worm control.

Boll worm eggs. One hundred sixty-nine (70.4 percent) of the producers did not need to control boll worm eggs and had a mean yield of 776.3 pounds of lint per acre. The other 71 respondents who did need to treat for boll worm eggs had a mean yield of 723.7 pounds of lint per acre. When tested by the analysis of variance F test, there was a significant relationship between the mean yield per acre and the need for boll worm egg control. Producers who did not need to control boll worm eggs were more likely to have higher yields than producers who did need to control boll worm eggs.

Spider mites. Control for spider mites was not needed by 231 producers (96.3 percent) who had a mean yield of 767.3 pounds of lint per acre compared to the 9 producers who did treat for spider mites and had a mean yield of 593.9 pounds of lint per acre. There was a significant relationship, when tested by the F test, between the mean yield per acre and the need for spider mite control. Producers who

did not need to treat for spider mites were more likely to have higher mean yields per acre than those who did.

Used boll weevil diapause control. Two hundred thirty-seven producers (98.8 percent) did not use boll weevil diapause control and had a mean yield of 766.2 pounds of lint per acre. Three producers did use boll weevil diapause control and had a mean yield of 408.3 pounds of lint per acre. According to the analysis of variance F test, there was a significant relationship between the mean yield per acre and the use of boll weevil diapause control. Producers who did not use boll weevil diapause control tended to have higher yields.

Insect scouting method used. Sixty-nine (28.8 percent) of the producers used a paid scout and had a mean yield of 827.8 pounds of lint per acre. Personal observation was used by 161 (67.1 percent) of the producers. They received a mean yield of 726.2 pounds of lint per acre. Ten producers used some other method of scouting and had a mean yield of 829.2 pounds of lint per acre. According to the F test, there was a significant relationship between the mean yield per acre and the insect scouting method used. Producers who employed scouts or used "other" methods of insect scouting tended to have larger yields than producers who used personal observation.

Frequency of insect scouting. A scouting frequency of less than once per week was used by 59 (25.1 percent) of the producers with a mean yield of 710.4 pounds of lint per acre. The 150 producers (63.9 percent) who scouted once per week had a mean yield of 788.5 pounds

of lint per acre while the 26 producers (11.0 percent) who scouted more than once per week had a mean yield of 722.7 pounds of lint per acre. There was a significant relationship between the mean yield per acre and the frequency of insect scouting when tested by the F test. Producers who scouted once per week tended to have higher yields than producers in the other groups.

Defoliation

The variables in this subsection are: (1) used chemical defoliation, and (2) percent of bolls open when defoliant applied.

Used chemical defoliation. Only 53 producers (22.0 percent) did not use chemical defoliation and reported a mean yield of 715.2 pounds of lint per acre. A mean yield of 774.0 pounds of lint per acre was obtained by the 188 producers (88.0 percent) who did use chemical defoliation. When tested by the F test, there was a significant relationship between the mean yield per acre and the use of chemical defoliation. Producers who used chemical defoliation tended to have higher mean yields per acre than those who did not use chemical defoliation.

Percent of bolls open when defoliant applied. Only 27 producers (11.2 percent) applied defoliant when less than 50 percent of the bolls were open. They had a mean yield of 703.0 pounds of lint per acre. The other 215 respondents applied defoliant when at least 50 percent of the bolls were open and received a mean yield of 769.4 pounds of lint per acre. There was no significant relationship between the mean

yield per acre and the percent of bolls open when defoliant applied according to the F test.

Harvesting

The variables in this subsection include: (1) own a cotton picker, and (2) do custom picking.

Own a cotton picker. Fifty producers (21.0 percent) did not own a cotton picker in 1987 and reported a mean yield of 746.3 pounds of lint per acre. The 192 producers who owned a cotton picker had a mean yield of 766.1 pounds of lint per acre. According to the analysis of variance F test, there was no significant relationship between the mean yield per acre and ownership of a cotton picker.

Do custom picking. One hundred fifty-nine (78.7 percent) of the 202 respondents did not custom pick and had a mean yield of 769.9 pounds of lint per acre. The 43 producers who did custom pick had a mean yield of 750.2 pounds of lint per acre. There was no significant relationship between the mean yield and custom picking according to the F test.

Table Summary

Findings revealed a significant relationship between mean yield per acre and use of 18 out of 54 selected production practices by cotton producers. The variety planted and the major equipment used in seedbed preparation were significantly related to the mean yield per acre. Planting in the recommended period, April 20-May 10 was significantly related to the mean yield per acre.

The type of material used for seed treatment, the use of a soil treatment, and the use of a fungicide plus insecticide for seedling disease control were significantly related to the mean yield per acre. Four of the fertilization practices were significantly related to the mean yield per acre. Those practices were: (1) fertilized according to soil test, (2) limed by soil test, (3) pounds of nitrogen applied per acre-upland, and (4) pounds of boron per acre without soil test. Producers fertilizing and liming according to soil test had significantly higher mean yields per acre than those not using a soil test.

There were no significant relationships between any of the weed control practices and the mean yield per acre. Only aphid control, boll weevil control, boll worm egg control, spider mite control, and boll weevil diapause control among the insect control practices were significantly related to mean yield per acre. Producers who used a paid scout were more likely to have higher mean yields than those producers who used personal observation. Also, producers whose fields were scouted once per week were more likely to have a higher mean yield than those who did not. There was a significant relationship between these practices and the mean yield per acre.

The use of chemical defoliation was significantly related to mean yield per acre. Producers who used chemical defoliation tended to have a higher mean yield than those who did not.

III. RELATIONSHIPS BETWEEN THE NUMBER OF ACRES HARVESTED AND SELECTED PRODUCTION PRACTICES USED BY TENNESSEE COTTON PRODUCERS

Table 3 presents data which indicates the relationships between the number of acres harvested and selected production practices used by Tennessee cotton producers. The purpose of the analysis was to determine what relationships exist between the total number of acres harvested and the use of certain production practices. Variables are grouped under the following subheadings: (1) variety, (2) seedbed preparation and seed treatment, (3) planting dates, (4) planting rate, (5) method of planting, (6) seedling disease control, (7) fertilization, (8) weed control, (9) insect control, (10) defoliation, (11) harvesting, and (12) yield.

Variety

The variables included in this subsection are: (1) variety planted, and (2) number of varieties planted.

Variety planted. Almost 87 percent of the producers who harvested less than 100 acres planted a recommended variety while slightly less than 90 percent of the producers harvesting between 100 and 200 acres planted a recommended variety. Of those producers who harvested more than 200 acres, almost 87 percent planted a recommended variety. According to the chi square test, there was not a significant relationship between the number of acres harvested and the variety planted.

Table 3. Relationships Between the Number of Acres Harvested and Selected Production Practices Used by Tennessee Cotton Producers

[illegible]

Table 3. (Continued)

Variable Name	Number of Acres Harvested					
	Under 100		100-200		201-Over	
	Number of Producers	Percent of Producers	Number of Producers	Percent of Producers	Number of Producers	Percent of Producers
Major Weed Problem						
Grass	10	16.4	6	15.8	15	10.6
Broadleaf	51	83.6	32	84.2	127	89.4
TOTAL	61	100.0	38	100.0	142	100.0
Chi square test $\chi^2 = 1.64$; d.f. = 2; p = 0.44						
INSECT CONTROL						
Aphids						
Control Not Needed	49	80.3	31	79.5	101	71.6
Control Needed	12	19.7	8	20.5	40	28.4
TOTAL	61	100.0	39	100.0	141	100.0
Chi square test $\chi^2 = 2.20$; d.f. = 2; p = 0.33						
Stink Bugs						
Control Not Needed	58	95.1	38	97.4	117	83.6
Control Needed	4	4.9	1	2.6	23	16.4
TOTAL	61	100.0	39	100.0	140	100.0
Chi square test $\chi^2 = 9.16$; d.f. = 2; p = 0.01						
Cutworms						
Control Not Needed	61	100.0	38	97.4	137	97.2
Control Needed	0	0.0	1	2.6	4	2.8
TOTAL	61	100.0	39	100.0	141	100.0
Chi square test $\chi^2 = 1.74$; d.f. = 2; p = 0.42						
Plant Bugs						
Control Not Needed	32	52.5	16	41.0	60	42.3
Control Needed	29	47.5	23	59.0	82	57.7
TOTAL	61	100.0	39	100.0	142	100.0
Chi square test $\chi^2 = 2.04$; d.f. = 2; p = 0.36						
Thrips						
Control Not Needed	36	59.0	18	46.2	64	45.4
Control Needed	25	41.0	21	53.8	77	54.6
TOTAL	61	100.0	39	100.0	141	100.0
Chi square test $\chi^2 = 3.31$; d.f. = 2; p = 0.19						
Whitefly						
Control Not Needed	60	98.4	39	100.0	135	96.4
Control Needed	1	1.6	0	0.0	5	3.6
TOTAL	61	100.0	39	100.0	140	100.0
Chi square test $\chi^2 = 1.84$; d.f. = 2; p = 0.40						
Boll Weevil						
Control Not Needed	43	70.5	27	69.2	79	56.4
Control Needed	18	29.5	12	30.8	61	43.6
TOTAL	61	100.0	39	100.0	140	100.0
Chi square test $\chi^2 = 4.58$; d.f. = 2; p = 0.10						
Boll Worm						
Control Not Needed	36	59.0	19	48.7	61	43.0
Control Needed	25	41.0	20	51.3	81	57.0
TOTAL	61	100.0	39	100.0	142	100.0
Chi square test $\chi^2 = 4.42$; d.f. = 2; p = 0.11						
Boll Worm Eggs						
Control Not Needed	46	75.4	30	76.9	93	66.0
Control Needed	15	24.6	9	23.1	48	34.0
TOTAL	61	100.0	39	100.0	141	100.0
Chi square test $\chi^2 = 2.84$; d.f. = 2; p = 0.24						

Number of varieties planted. Almost 74 percent of the producers harvesting less than 100 acres planted one variety as compared to 43.6 percent of those harvesting 100-200 acres and 11.2 percent of those harvesting over 200 acres. Two varieties were planted by 14.8 percent of those harvesting under 100 acres, 46.2 percent of those harvesting 100-200 acres, and 38.5 percent of those producers who harvested 201 or more acres. Over 50 percent of the producers harvesting more than 200 acres planted 3 or more varieties, compared to 11.5 percent of those harvesting under 100 acres, and 10.3 percent of those who harvested 100 to 200 acres. When tested by the chi square test, the number of acres harvested was significantly related to the number of varieties planted. Producers harvesting 201 or more acres of cotton were more likely to plant more varieties than producers harvesting less acres.

Seedbed Preparation and Seed

The variables included in this subsection are: (1) major equipment used, (2) number of times land tilled, and (3) used certified seed.

Major equipment used. A combination of equipment was used by the majority of producers in each category. The moldboard plow was used by 6.6 percent of those harvesting less than 100 acres, 5.1 percent of those harvesting 100-200 acres, and only 4.2 percent harvesting 201 or more acres. The disk was used by 8.2 percent harvesting less than 100 acres, 10.3 percent harvesting 100-200 acres, and 4.2 percent harvesting 201 or more acres. Over 8 percent of the producers harvesting less than 100 acres used a chisel plow compared to 25.6 percent of

those harvesting 100-200 acres, and 11.9 percent harvesting more than 200 acres. Other equipment was used by 6.5 percent of those harvesting under 100 acres and 2.1 percent of those harvesting over 200 acres. There was no significant relationship between the number of acres harvested and the major equipment used for seedbed preparation according to the chi square test.

Number of times land tilled. The majority of producers in each category used tillage 1 to 4 times. Almost 38 percent of those harvesting under 100 acres till 5 or more times compared to 30.8 percent harvesting 100-200 acres and 44.1 percent of those harvesting over 200 acres. When tested by the chi square test, the number of acres harvested was not significantly related to the number of times the land was tilled.

Used certified seed. Over 98 percent of those producers harvesting less than 100 acres planted certified seed. Compare this to 100 percent of those harvesting from 100 to 200 acres and also to the 97.9 percent of those harvesting over 200 acres. These differences are not significant when tested by the chi square test.

Planting Dates

The variables included in this subsection are: (1) planted April 20-May 10, (2) planted before April 20, and (3) planted after May 10.

Planted April 20-May 10. Almost all (99.3 percent) of the producers harvesting more than 200 acres planted between April 20 and May 10 while 97.4 percent of those harvesting 100-200 acres planted during this time. Of those producers harvesting less than 100 acres, 93.4

percent planted during this period. According to the chi square test, there was a significant relationship between the number of acres harvested and the number of acres planted between April 20 and May 10. Larger producers were more likely than smaller producers to plant in the recommended time period.

Planted before April 20. Slightly over 98 percent of the producers harvesting less than 100 acres did not plant any cotton before April 20 compared to 100 percent of those harvesting between 100 and 200 acres and 79.2 percent of those harvesting over 200 acres. When tested by the chi square test, the number of acres harvested was significantly related to the number of acres planted before April 20. Producers harvesting over 200 acres were more likely to begin planting earlier than other producers.

Planted after May 10. Of the producers harvesting less than 100 acres, 86.9 percent did not plant any cotton after May 10. Compare this with the 76.9 percent of those harvesting between 100 and 200 acres and 60.1 percent of those who harvested 201 or more acres who did not plant any acres to cotton after May 10. The number of acres harvested was significantly related to planting after May 10 according to the chi square test. The larger the number of acres harvested, the more likely to have cotton planted after May 10.

Seed Type Planted

The variables in this subsection include: (1) drilled--machine-delinted seed, (2) drilled--acid-delinted seed, (3) hill dropped--machine-delinted seed, and (4) hill dropped--acid delinted seed.

Drilled--machine-delinted seed. The majority of producers who harvested under 100 acres (96.7 percent) did not drill machine-delinted seed. Among producers harvesting from 100 to 200 acres, 94.9 percent did not while 97.9 percent of producers harvesting over 200 acres did drill machine-delinted seed. The number of acres harvested was not significantly related to drilling machine-delinted seed when tested by the chi square test.

Drilled--acid-delinted seed. Slightly over 90 percent of producers harvesting less than 100 acres, over 84 percent of those harvesting 100-200 acres, and just under 96 percent of those harvesting over 200 acres drilled acid-delinted seed. There was a significant relationship, according to the chi square test, between the number of acres harvested and drilled acid-delinted seed. Producers harvesting over 200 acres were more likely to drill acid-delinted cotton seed than were the smaller producers.

Hill dropped--machine-delinted seed. Of those producers harvesting less than 100 acres, 90.2 percent did not hill drop machine-delinted seed. Among producers who harvested 100-200 acres, 84.6 percent did not use this practice and 89.5 percent of those harvesting 201 or more acres did not use the practice. According to the chi square test, no significant relationship existed between the number of acres harvested and the practice of hill dropping machine-delinted seed.

Hill dropped--acid-delinted seed. A large majority (93.4 percent) of the producers harvesting under 100 acres did not hill drop acid-delinted

seed. Over 89 percent of producers harvesting 100-200 acres did not use the practice. Of producers harvesting over 200 acres, 96.5 percent did not use the practice. When tested by the chi square test, the number of acres harvested was not significantly related to hill dropping acid-delinted seed.

Method of Planting

Variables included in this subsection are: (1) drilled, (2) hill dropped, and (3) replanted.

Drilled. Among producers harvesting less than 100 acres, 91.8 percent used the practice of drilling cotton seed. Almost 90 percent of the producers harvesting 100-200 acres used the practice while 96.5 percent of the producers harvesting more than 200 acres used the practice. The number of acres harvested was not significantly related to the practice of drilling seed according to the chi square test.

Hill dropped. Over 93 percent of the producers harvesting under 100 acres did not hill drop. Almost 90 percent of the respondents harvesting from 100 to 200 acres and 96.5 percent of the producers that harvested over 200 acres did not use the practice. The number of acres harvested was not significantly related to the practice of hill dropping seed according to the chi square test.

Replanted. Of the respondents harvesting less than 100 acres, 95.1 percent did not replant any cotton acreage. Among producers harvesting 100-200 acres, 97.4 percent did not replant while 92.3 percent of those harvesting more than 200 acres did not replant. According

to the chi square test, the number of acres harvested was not significantly related to the practice of replanting.

Seedling Disease Control

Variables included in this subsection are: (1) used seed treatment, (2) type material used--seed, (3) used soil treatment (a) fungicide only, (b) fungicide plus insecticide, and (c) method used.

Used seed treatment. One hundred percent of producers harvesting more than 200 acres used seed treatment compared to 97.4 percent of those harvesting between 100 and 200 acres and 98.4 percent of producers harvesting under 100 acres. No significant relationship existed, when tested by the chi square test, between the number of acres harvested and the practice of using seed treatment.

Type material used--seed. Eighty-six percent of the producers harvesting less than 100 acres reported the use of a fungicide plus insecticide, while 97.3 percent of producers harvesting 100-200 acres reported the same. This compares to 97.9 percent harvesting over 200 acres who used a fungicide plus insecticide. A significant relationship did exist between the number of acres harvested and the type of material used in seed treatment when tested by the chi square test. Larger producers (over 100 acres) were more likely to use this practice than were the smaller producers.

Used soil treatment. Almost 52 percent of producers harvesting more than 200 acres used a soil treatment while only 35.9 percent of producers harvesting 100-200 acres and 23.3 percent of those harvesting

less than 100 acres used the practice. The number of acres harvested was significantly related to the use of a soil treatment according to the chi square test. Producers harvesting more than 200 acres were more likely than the smaller producers to use the practice of treating soil for disease control.

Fungicide only--soil. One hundred percent of producers harvesting less than 100 acres did not use a fungicide alone compared to 83.3 percent of those harvesting 100-200 acres and 74.0 percent of those harvesting over 200 acres. When tested by the chi square test, the number of acres harvested was significantly related to the use of a fungicide alone. Larger producers were more likely than smaller producers to use a fungicide alone for treatment.

Fungicide plus insecticide--soil. Sixty-two percent of the producers harvesting over 200 acres used a fungicide plus insecticide while 40.7 percent of those harvesting 100-200 acres and 31.7 percent of those harvesting less than 100 acres used both. According to the chi square test, there was a significant relationship between the number of acres harvested and the use of a fungicide plus insecticide. Larger producers were more likely to use a fungicide plus insecticide than smaller producers.

Method used--soil. A hopper-box dust application was used by 6.7 percent of producers harvesting less than 100 acres, 20 percent of those harvesting from 100 to 200 acres and 11.8 percent of those harvesting more than 200 acres. An in-furrow application was used by 95.3 percent of the producers who harvested less than 100 acres,

80.0 percent of those harvesting 100-200 acres, and 88.2 percent harvesting more than 200 acres. When tested by the chi square test, the number of acres harvested was not significantly related to the method used for soil treatment.

Fertilization

The variables included in this subsection are: (1) fertilized according to soil test, (2) limed by soil test, (3) pounds of nitrogen applied per acre-upland, (4) pounds of nitrogen applied per acre-bottomland, (5) pounds of phosphate per acre without soil test, (6) pounds of potash per acre without soil test, and (7) pounds of boron per acre without soil test.

Fertilized according to soil test. Seventy-two percent of the producers harvesting over 200 acres fertilized according to soil test. This compares to 64.1 percent of those who harvested 100-200 acres and 50.8 percent of those harvesting less than 100 acres. There was a significant relationship between the number of acres harvested and fertilizing according to soil test according to the chi square test. Those harvesting more acres were more likely to use the practice of fertilizing according to soil test than were the smaller producers.

Limed by soil test. A majority of producers (56.6 percent) harvesting over 200 acres applied lime by soil test. Compare this to the 35.9 percent of producers harvesting 100-200 acres and the 23.0 percent of producers harvesting less than 100 acres who limed by soil test. When tested by the chi square test, there was a significant

relationship between the number of acres harvested and the practice of liming by soil test. Larger producers were more likely to adopt the practice of liming by soil test than producers in the other groups.

Pounds of nitrogen applied per acre-upland. Producers harvesting less than 100 acres applied less than 75 pounds of nitrogen at a higher rate (39.3 percent) than did producers harvesting 100-200 acres (15.4 percent) and 17.5 percent of those harvesting more than 200 acres. More than 86 pounds of nitrogen was applied by 59.4 percent of those harvesting more than 200 acres and 56.4 percent of those harvesting 100-200 acres, but by only 37.7 percent of those who harvested under 100 acres. There was a significant relationship, when tested by the chi square test, between the number of acres harvested and the amount of nitrogen applied per acre-upland. Larger producers were more likely to use higher amounts of nitrogen than the smaller producers.

Pounds of nitrogen applied per acre-bottomland. Over 60 percent of the producers harvesting over 200 acres applied 61 or more pounds of nitrogen and 59.0 percent of those that harvested 100-200 acres applied the same amount while 55.7 percent of those harvesting less than 100 acres were in this category. Almost 33 percent of those that harvested under 100 acres applied less than 60 pounds of nitrogen compared to only 12.8 percent of those harvesting 100-200 acres and 14.7 percent of those that harvested more than 200 acres. According to the chi square test, a significant relationship did exist between the number of acres harvested and the amount of nitrogen applied per acre-bottomland.

Producers harvesting larger acreage were more likely to apply nitrogen at higher rates than smaller producers.

Pounds of phosphate per acre without soil test. Almost 72 percent of the producers harvesting under 100 acres applied 20-60 pounds of phosphate compared to 65.4 percent of those harvesting 100-200 acres and 63.8 percent of those harvesting over 200 acres. The remainder of the 170 producers responding applied 61 pounds or more. There was no significant relationship between the number of acres harvested and the amount of phosphate applied per acre without a soil test when tested by the chi square test.

Pounds of potash per acre without soil test. Ten percent of the producers harvesting less than 100 acres, 11.5 percent of those harvesting 100-200 acres, and 15.0 percent of those harvesting over 200 acres applied 12-59 pounds of potash. Over 52 percent of those harvesting under 100 acres, 34.6 percent of those harvesting 100-200 acres and 33.6 percent of those harvesting over 200 acres applied 60-165 pounds. Over 35 percent of those harvesting less than 100 acres, 53.9 percent of those harvesting 100-200 acres and 49.4 percent of those harvesting over 200 acres applied 166 or more pounds of potash. No significant relationship existed between the number of acres harvested and the number of pounds of potash applied per acre without soil test according to the chi square test.

Pounds of boron per acre without soil test. No boron was applied without a soil test by 52.5 percent of producers harvesting under 100

acres, 43.6 percent of those harvesting 100-200 acres and 35.0 percent of those harvesting over 200 acres. One pound was applied by 26.2 percent harvesting under 100 acres, 28.2 percent harvesting 100-200 acres and 35.0 percent of those harvesting over 200 acres. Three pounds were applied by only 4.9 percent of those harvesting under 100 acres, 15.4 percent of those harvesting 100-200 acres and 10.5 percent of those harvesting over 200 acres. Four pounds were applied by 16.4 percent of the producers harvesting under 100 acres, 12.8 percent of those harvesting 100-200 acres and 19.5 percent of those harvesting at least 201 acres. According to the chi square test, there was no significant relationship between the number of acres harvested and the amount of boron applied per acre without a soil test.

Weed Control

The variables in this subsection are: (1) used rotation with corn or soybeans to control weeds, (2) used rotary hoeing, (3) used cultivation, (4) applied preplant chemical to control weeds, (5) applied pre-emergence chemical to control weeds, (6) applied post-directed chemical to control weeds, and (7) major weed problem.

Used rotation with corn or soybeans to control weeds. Over 87 percent of the producers harvesting 100 to 200 acres used rotation as a weed control practice while 81.1 percent of those harvesting over 200 acres and 60.7 percent of those harvesting less than 100 acres used the practice. A significant relationship did exist between the number of acres harvested and the use of rotation as a weed control practice according to the chi square test. Producers harvesting 100-200

acres were more likely than smaller producers to use crop rotation for weed control.

Used rotary hoeing. One hundred percent of producers in the group harvesting 100-200 acres did not use rotary hoeing to control weeds. Over 95 percent of the producers harvesting over 200 acres and 93.4 percent of those harvesting under 100 acres did not use the practice. No significant relationship existed between the number of acres harvested and the practice of using rotary hoeing to control weeds when tested by the chi square test.

Used cultivation. All of the producers in the 100-200 acre group, 99.3 percent of those harvesting over 200 acres, and 95.1 percent of those harvesting less than 100 acres used cultivation to control weeds. There was no significant relationship between the number of acres harvested and the use of cultivation to control weeds according to the chi square test.

Applied preplant chemical to control weeds. Almost 89 percent of those harvesting under 100 acres used preplant chemicals to control weeds compared to 82.1 percent of those harvesting 100-200 acres and 82.5 percent of those harvesting over 200 acres. When tested by the chi square test, there was no significant relationship between the number of acres harvested and the practice of applying preplant chemical to control weeds.

Applied pre-emergence chemical to control weeds. Almost 89 percent of the producers harvesting under 100 acres, 82.1 percent of those

harvesting 100-200 acres, and 86.7 percent of those harvesting over 200 acres applied pre-emergence chemical to control weeds. There was not a significant relationship, according to the chi square test, between the number of acres harvested and the use of pre-emergence chemicals to control weeds.

Applied post-directed chemical to control weeds. Sixty-three percent of those harvesting over 200 acres used post-directed chemicals for weed control compared to 46.1 percent of those harvesting 100-200 acres and 42.6 percent of those harvesting under 100 acres. When tested by the chi square test, there was a significant relationship between the number of acres harvested and the use of post-directed chemicals to control weeds. Producers harvesting over 200 acres were more likely than smaller producers to use post-directed chemicals to control weeds.

Major weed problem. Over 89 percent of producers harvesting over 200 acres reported broadleaf weeds as their major weed problem. Broad-leaves were the major weed problem for 84.2 percent of the producers harvesting 100-200 acres and 83.6 percent of those harvesting under 100 acres. According to the chi square test, there was no significant relationship between the number of acres harvested and the major weed problem.

Insect Control

The variables included in this subsection are: (1) aphids, (2) stink bugs, (3) cutworms, (4) plant bugs, (5) thrips, (6) whitefly, (7) boll weevil, (8) boll worm, (9) boll worm eggs, (10) spider mites,

(11) insect scouting method used, and (12) frequency of insect scouting.

Aphids. Slightly over 80 percent of the producers harvesting under 100 acres, 79.5 percent of those harvesting 100-200 acres, and 71.6 percent of those harvesting over 200 acres said control for aphids was not needed. No significant relationship existed between the number of acres harvested and the need for aphid control when tested by the chi square test.

Stink bugs. Over 95 percent of the producers harvesting under 100 acres indicated control was not necessary while 97.4 percent of the producers harvesting 100-200 acres thought control not necessary. Only 83.6 percent of the producers harvesting over 200 acres said control was not necessary. According to the chi square test, there was a significant relationship between the number of acres harvested and need for control of stink bugs. Producers harvesting over 200 acres were more likely to indicate control was needed than smaller producers.

Cutworms. All producers harvesting less than 100 acres reported that control was not needed for cutworms compared to 97.4 percent of producers harvesting 100-200 acres and 97.2 percent of the producers that harvested more than 200 acres. When tested by the chi square test, there was no significant relationship between the number of acres harvested and the need for cutworm control.

Plant bugs. Control for plant bugs was not needed by 52.5 percent of the producers harvesting under 100 acres, 41.0 percent of those harvesting 100-200 acres, and 42.3 percent of those harvesting 201 acres or more. There was not a significant relationship, when tested by the chi square test, between the number of acres harvested and the need for plant bug control.

Thrips. Thrips control was not needed by 59.0 percent of those harvesting under 100 acres, 46.2 percent of those harvesting 100-200 acres, and 45.4 percent of those harvesting over 200 acres. No significant relationship existed according to the chi square test, between the number of acres harvested and the need for thrips control.

Whitefly. One hundred percent of the producers harvesting 100-200 acres did not need a control for whiteflies compared to 98.4 percent of those harvesting under 100 acres and 96.4 percent of those harvesting more than 200 acres. There was not a significant relationship between the number of acres harvested and the need for whitefly control when tested by the chi square test.

Boll weevil. Over 70 percent of the producers harvesting less than 100 acres felt that a control was not needed compared to the 69.2 percent of producers harvesting 100-200 acres and 56.4 percent of those harvesting over 200 acres who felt control was not necessary. No significant relationship existed between the number of acres harvested and the need for boll weevil control

Boll worm. Fifty-nine percent of the respondents harvesting under 100 acres did not need control for boll worms compared to 48.7 percent of those harvesting 100-200 acres and 43.0 percent of those harvesting 201 acres or more. When tested by the chi square test, there was not a significant relationship between the number of acres harvested and the need for boll worm control.

Boll worm eggs. Boll worm egg control was not needed for 75.4 percent of producers harvesting under 100 acres, 76.9 percent of those harvesting 100-200 acres, and 66.0 percent of those harvesting more than 200 acres. No significant relationship existed between the number of acres harvested and the need for boll worm egg control when tested by the chi square test.

Spider mites. Control for spider mites was not necessary for 98.4 percent of producers harvesting less than 100 acres, 92.3 percent of those harvesting 100-200 acres, and 96.5 percent of those harvesting over 200 acres. According to the chi square test, there was no significant relationship between the number of acres harvested and the need for spider mite control.

Insect scouting method used. A paid scout was used by 23.0 percent of respondents harvesting less than 100 acres, 39.5 percent of those harvesting 100-200 acres, and 28.2 percent of those harvesting over 200 acres. Personal observation was the method used by 73.7 percent of those harvesting under 100 acres, 57.9 percent of those harvesting 100-200 acres, and 66.9 percent of those harvesting over 200 acres.

Some other method was used by 3.3 percent of those harvesting less than 100 acres, 2.6 percent of those harvesting 100-200 acres and 4.9 percent of those harvesting over 200 acres. There was not a significant relationship between the number of acres harvested and the method used to scout for insects when tested by the chi square test.

Frequency of insect scouting. Scouting less than once per week was done by 47.5 percent of the respondents harvesting under 100 acres, 21.6 percent of those harvesting 100-200 acres, and 16.4 percent of those harvesting over 200 acres. A frequency of once per week was used by 45.7 percent of those harvesting less than 100 acres, 62.2 percent of those harvesting 100-200 acres, and 72.2 percent of those harvesting over 200 acres. Scouting more than once per week was done by 6.8 percent of producers harvesting less than 100 acres, 13.2 percent of those harvesting 100-200 acres, and 11.4 percent of those harvesting more than 200 acres. There was a significant relationship between the number of acres harvested and the frequency of insect scouting according to the chi square test. Larger producers were more likely to scout for insects at least once per week than were smaller producers.

Defoliation

The variables included in this subsection are: (1) used chemical defoliation, and (2) percent of bolls open when defoliant applied.

Used chemical defoliation. Chemical defoliation was used by 57.4 percent of producers that harvested less than 100 acres compared to 79.5 percent of those harvesting 100-200 acres and 86.6 percent of those harvesting over 200 acres. There was a significant relationship

between the number of acres harvested and the use of chemical defoliation when tested by the chi square test. Larger producers were more likely than smaller producers to use chemical defoliation.

Percent of bolls open when defoliant applied. Over 90 percent of producers harvesting under 100 acres, 87.2 percent of those harvesting 100-200 acres, and 88.1 percent of those harvesting 201 acres or more applied defoliant when 50 percent or more of the bolls were open. No significant relationship existed, according to the chi square test, between the number of acres harvested and the percent of bolls open when defoliant was applied.

Harvesting

The variables included in this subsection are: (1) own a cotton picker, and (2) do custom picking.

Own a cotton picker. Almost 94 percent of producers harvesting over 200 acres owned a cotton picker compared to 76.9 percent of those harvesting 100-200 acres and 45.9 percent of those harvesting under 100 acres who owned a cotton picker. There was a significant relationship between the number of acres harvested and ownership of a cotton picker when tested by the chi square test. Larger producers were more likely than smaller producers to own their own pickers.

Do custom picking. Only 14.3 percent of producers harvesting under 100 acres, 15.6 percent of those harvesting 100-200 acres, and 24.4 percent of those harvesting over 200 acres did custom picking.

There was no significant relationship between the number of acres harvested and custom picking when tested by the chi square test.

Yield

The variable in this subsection is: (1) pounds of lint per acre.

Pounds of lint per acre. A yield of less than 480 pounds per acre was reported by 8.2 percent of those harvesting under 100 acres and 2.8 percent of those harvesting over 200 acres. A yield between 480-959 pounds was reported by 80.3 percent of those harvesting less than 100 acres, 82.1 percent of those harvesting 100-200 acres and 83.9 percent of those harvesting over 200 acres. A yield of 960 pounds or greater was reported by 11.5 percent of those harvesting under 100 acres, 17.9 percent of those harvesting 100-200 acres, and 13.3 percent of those harvesting over 200 acres. There was not a significant relationship between the number of acres harvested and the pounds of lint per acre according to the chi square test. Larger producers were no more likely than smaller producers to have higher yields per acre.

Table Summary

Findings revealed a significant relationship between the number of acres harvested and use of 19 out of 52 selected production practices by cotton producers. The number of varieties planted was significantly related to the number of acres harvested. Seedbed preparation and seed treatment practices were not significantly related to the number of acres harvested. All of the selected practices related to planting

dates were significantly related to the number of acres harvested. Among the practices related to planting methods and seed type planted, only the practice of drilling acid-delinted seed was significantly related to the number of acres harvested. Larger producers were more likely to use these practices than were the smaller producers.

Of the selected practices concerning seedling disease control, the type material used for seed treatment, use of a soil treatment, use of fungicide, and use of a fungicide plus insecticide were significantly related to the number of acres harvested. Again, larger producers were more likely to use these practices than were the smaller producers.

Each of the selected fertilization and liming practices were significantly related to the number of acres harvested except for (1) pounds of phosphate per acre without soil test, (2) pounds of potash per acre without soil test, and (3) pounds of boron per acre without soil test. Also, the use of rotation with corn or soybeans to control weeds and the use of post-directed chemical to control weeds were significantly related to the number of acres harvested.

Among the selected insect control practices, only stink bug control and the frequency of insect scouting were significantly related to the number of acres harvested.

The use of chemical defoliation was significantly related to the number of acres harvested as was ownership of a cotton picker. Larger producers were more likely to use chemical defoliation and to own a cotton picker than were the smaller producers.

IV. RELATIONSHIPS BETWEEN THE NUMBER OF EXTENSION CONTACTS AND SELECTED PRODUCTION PRACTICES USED BY TENNESSEE COTTON PRODUCERS

Table 4 presents data regarding relationships between the total number of Extension contacts in a 12 month period and the production practices used by the producers. The purpose of the analysis was to determine the relationships between the total number of Extension contacts in the 12 month period and the use of selected recommended cotton production practices. The variables are classified under the following subheadings: (1) seed preparation and treatment, (2) planting dates, (3) planting rate, (4) method of planting, (5) seedling disease control, (6) other diseases, (7) fertilization, (8) weed control, (9) insect control, and (10) defoliation. The chi square test was used to determine significant relationships between variables.

Seed Preparation and Treatment

The variable included in this subsection is: (1) used certified seed.

Used certified seed. Among producers with 5 or less Extension contacts, 98.4 percent used certified seed on either all or part of their acreage compared to 98.3 percent of the producers with 6 or more Extension contacts. There was no significant relationship between the number of Extension contacts and the producers use of certified seed.

Table 4. Relationships Between the Number of Extension Contacts and Selected Production Practices Used by Tennessee Cotton Producers

Production Practice	Extension Contacts			
	5 or Less		6 and Over	
	Number of Producers	Percent of Producers	Number of Producers	Percent of Producers
SEED PREPARATION AND TREATMENT				
Used Certified Seed				
Not Any	1	1.6	3	1.7
Part	4	6.6	19	10.7
All	56	91.8	156	87.6
TOTAL	61	100.0	178	100.0
Chi square test $x^2 = 0.89$; d.f. = 2; p = 0.64				
PLANTING DATES				
Acres Planted April 20-May 10				
No	1	1.6	5	2.7
Yes	60	98.4	177	97.3
TOTAL	61	100.0	182	100.0
Chi square test $x^2 = 0.00$; d.f. = 1; p = 0.99				
Acres Planted Before April 20				
No	54	84.2	161	88.3
Yes	9	15.8	19	11.7
TOTAL	63	100.0	183	100.0
Chi square test $x^2 = 0.33$; d.f. = 1; p = 0.56				
Acres Planted After May 10				
No	47	77.0	122	67.0
Yes	14	23.0	60	33.0
TOTAL	61	100.0	182	100.0
Chi square test $x^2 = 1.72$; d.f. = 1; p = 0.19				
SEED TYPE PLANTED				
Drilled--Machine-Delinted Seed				
No	61	100.0	175	96.2
Yes	0	0.0	7	3.8
TOTAL	61	100.0	182	100.0
Chi square test $x^2 = 1.24$; d.f. = 1; p = 0.26				
Drilled--Acid-Delinted Seed				
No	5	8.2	13	7.1
Yes	56	91.8	169	92.9
TOTAL	61	100.0	182	100.0
Chi square test $x^2 = 0.00$; d.f. = 1; p = 1.00				
Hill Dropped--Machine-Delinted Seed				
No	57	93.4	159	87.4
Yes	4	6.6	23	12.6
TOTAL	61	100.0	182	100.0
Chi square test $x^2 = 1.15$; d.f. = 1; p = 0.28				
Hill Dropped--Acid-Delinted Seed				
No	56	91.8	174	95.6
Yes	5	8.2	8	4.4
TOTAL	61	100.0	182	100.0
Chi square test $x^2 = 0.66$; d.f. = 1; p = 0.41				
METHOD OF PLANTING				
Drilled				
No	6	9.8	8	4.4
Yes	55	90.2	174	95.6
TOTAL	61	100.0	182	100.0
Chi square test $x^2 = 1.59$; d.f. = 1; p = 0.21				

Table 4. (Continued)

Production Practices	Extension Contacts			
	5 or Less		6 and Over	
	Number of Producers	Percent of Producers	Number of Producers	Percent of Producers
Hill-Dropped				
No	55	90.2	175	96.2
Yes	6	9.8	7	3.8
TOTAL	61	100.0	182	100.0
	Chi square test $x^2 = 2.16$; d.f. = 1; p = 0.14			
Replanted				
No	60	98.4	168	92.3
Yes	1	1.6	14	7.7
TOTAL	61	100.0	182	100.0
	Chi square test $x^2 = 1.94$; d.f. = 1; p = 0.16			
SEEDLING DISEASE CONTROL				
Type Material Used--Seed				
Fungicide Only	3	5.1	9	5.1
Fungicide Plus Insecticide	56	94.9	168	94.9
TOTAL	59	100.0	177	100.0
	Chi square test $x^2 = 0.00$; d.f. = 1; p = 1.00			
Used Soil Treatment				
No	39	63.9	101	55.8
Yes	22	36.1	80	44.2
TOTAL	61	100.0	181	100.0
	Chi square test $x^2 = 0.93$; d.f. = 1; p = 0.33			
Fungicide Only--Soil				
No	37	77.1	93	83.8
Yes	11	22.9	18	16.2
TOTAL	48	100.0	111	100.0
	Chi square test $x^2 = 0.61$; d.f. = 1; p = 0.43			
Fungicide Plus Insecticide--Soil				
No	31	67.4	51	41.8
Yes	15	32.6	71	58.2
TOTAL	46	100.0	122	100.0
	Chi square test $x^2 = 7.76$; d.f. = 1; p = 0.01			
Method Used--Soil				
Hopper-Box Dust	5	21.7	8	9.6
In-furrow	18	78.3	75	90.4
TOTAL	23	100.0	83	100.0
	Chi square test $x^2 = 1.46$; d.f. = 1; p = 0.23			
DISEASES				
Verticillium Wilt--Was This a Problem?				
No Problem	52	85.2	157	86.7
Part of Crop	9	14.8	24	13.3
TOTAL	61	100.0	181	100.0
	Chi square test $x^2 = 0.01$; d.f. = 1; p = 0.93			
Used Wilt-Resistant Variety				
No	23	37.7	88	51.8
Yes	38	62.3	82	48.2
TOTAL	61	100.0	170	100.0
	Chi square test $x^2 = 3.01$; d.f. = 1; p = 0.08			

Table 4. (Continued)

Production Practices	Extension Contacts			
	5 or Less		6 and Over	
	Number of Producers	Percent of Producers	Number of Producers	Percent of Producers
FERTILIZATION				
Fertilized According to Soil Test				
No	34	55.7	50	27.5
Yes	27	44.3	132	72.5
TOTAL	61	100.0	182	100.0
Chi square test $x^2 = 14.91$; d.f. = 1; $p < 0.01$				
Limed by Soil Test				
No	37	60.7	97	53.3
Yes	24	39.3	85	46.7
TOTAL	61	100.0	182	100.0
Chi square test $x^2 = 0.72$; d.f. = 1; $p = 0.39$				
Pounds of Nitrogen Applied Per Acre-Upland				
75 Pounds or Less	16	26.2	39	21.4
76-85 Pounds	6	9.8	52	28.6
86-Over Pounds	39	63.9	91	50.0
TOTAL	61	100.0	182	100.0
Chi square test $x^2 = 8.84$; d.f. = 2; $p = 0.01$				
Pounds of Nitrogen Applied Per Acre-Bottomland				
Under 60 Pounds	11	18.0	35	19.2
60 Pounds	15	24.6	39	21.4
61-Over Pounds	35	57.4	108	59.4
TOTAL	61	100.0	182	100.0
Chi square test $x^2 = 0.27$; d.f. = 2; $p = 0.87$				
Pounds of Phosphate Per Acre Without Soil Test				
20-60 Pounds	31	60.8	81	68.1
61-Over Pounds	20	39.2	38	31.9
TOTAL	51	100.0	119	100.0
Chi square test $x^2 = 0.55$; d.f. = 1; $p = 0.46$				
Pounds of Potash Per Acre Without Soil Test				
12-59 Pounds	7	13.7	16	13.4
60-165 Pounds	18	35.3	48	40.3
166-Over Pounds	26	51.0	55	46.3
TOTAL	51	100.0	119	100.0
Chi square test $x^2 = 0.41$; d.f. = 2; $p = 0.81$				
Pounds of Boron Per Acre Without Soil Test				
Not Any	28	45.9	71	39.0
1	20	32.8	57	31.3
3	3	4.9	21	11.5
4	10	16.4	33	18.1
TOTAL	61	100.0	182	100.0
Chi square test $x^2 = 2.67$; d.f. = 3; $p = 0.45$				
WEED CONTROL				
Used Rotation With Corn or Soybeans to Control Weeds				
No	20	32.8	36	19.8
Yes	41	67.2	146	80.2
TOTAL	61	100.0	182	100.0
Chi square test $x^2 = 3.66$; d.f. = 1; $p = 0.06$				

Table 4. (Continued)

Production Practices	Extension Contacts			
	5 or Less		6 and Over	
	Number of Producers	Percent of Producers	Number of Producers	Percent of Producers
Used Rotary Hoeing				
No	58	95.1	174	95.6
Yes	3	4.9	8	4.4
TOTAL	61	100.0	182	100.0
Chi square test $\chi^2 = 0.00$; d.f. = 1; p = 1.00				
Used Cultivation				
No	1	1.6	3	1.6
Yes	60	98.4	179	98.4
TOTAL	61	100.0	182	100.0
Chi square test $\chi^2 = 0.00$; d.f. = 1; p = 1.00				
Applied Preplant Chemical to Control Weeds				
No	12	19.7	27	14.8
Yes	49	80.3	155	85.2
TOTAL	61	100.0	182	100.0
Chi square test $\chi^2 = 0.47$; d.f. = 1; p = 0.49				
Applied Pre-emergence Chemical to Control Weeds				
No	6	9.8	27	14.8
Yes	55	90.2	155	85.2
TOTAL	61	100.0	182	100.0
Chi square test $\chi^2 = 0.59$; d.f. = 1; p = 0.44				
Applied Post-directed Chemical to Control Weeds				
No	27	44.3	82	45.1
Yes	34	55.7	100	54.9
TOTAL	61	100.0	182	100.0
Chi square test $\chi^2 = 0.00$; d.f. = 1; p = 1.00				
Major Weed Problem				
Grass	7	11.5	24	13.3
Broadleaf	54	88.5	156	86.7
TOTAL	61	100.0	180	100.0
Chi square test $\chi^2 = 0.02$; d.f. = 1; p = 0.87				
INSECT CONTROL				
Aphids				
Control Not Needed	42	68.9	139	77.2
Control Needed	19	31.1	41	22.8
TOTAL	61	100.0	180	100.0
Chi square test $\chi^2 = 1.29$; d.f. = 1; p = 0.26				
Stink Bugs				
Control Not Needed	52	85.2	161	89.9
Control Needed	9	14.8	18	10.1
TOTAL	61	100.0	179	100.0
Chi square test $\chi^2 = 0.59$; d.f. = 1; p = 0.44				
Cutworms				
Control Not Needed	57	93.4	179	99.4
Control Needed	4	6.6	1	0.6
TOTAL	61	100.0	180	100.0
Chi square test $\chi^2 = 5.39$; d.f. = 1; p = 0.02				
Plant Bugs				
Control Not Needed	28	45.9	80	44.2
Control Needed	33	54.1	101	55.8
TOTAL	61	100.0	181	100.0
Chi square test $\chi^2 = 0.01$; d.f. = 1; p = 0.93				

Table 4. (Continued)

Production Practices	Extension Contacts			
	5 or Less		6 and Over	
	Number of Producers	Percent of Producers	Number of Producers	Percent of Producers
Thrips				
Control Not Needed	28	45.9	90	50.0
Control Needed	33	54.1	90	50.0
TOTAL	61	100.0	180	100.0
Chi square test $x^2 = 0.16$; d.f. = 1; p = 0.69				
Whitefly				
Control Not Needed	59	96.7	175	97.8
Control Needed	2	3.3	4	2.2
TOTAL	61	100.0	179	100.0
Chi square test $x^2 = 0.00$; d.f. = 1; p = 1.00				
Boll Weevil				
Control Not Needed	38	62.3	111	62.0
Control Needed	23	37.7	68	38.0
TOTAL	61	100.0	179	100.0
Chi square test $x^2 = 0.00$; d.f. = 1; p = 1.00				
Boll Worm				
Control Not Needed	30	49.2	86	47.5
Control Needed	31	50.8	95	52.5
TOTAL	61	100.0	181	100.0
Chi square test $x^2 = 0.01$; d.f. = 1; p = 0.94				
Boll Worm Eggs				
Control Not Needed	45	73.8	124	68.9
Control Needed	16	26.2	56	31.1
TOTAL	61	100.0	180	100.0
Chi square test $x^2 = 0.31$; d.f. = 1; p = 0.58				
Spider Mites				
Control Not Needed	58	95.1	174	96.7
Control Needed	3	4.9	6	3.3
TOTAL	61	100.0	180	100.0
Chi square test $x^2 = 0.03$; d.f. = 1; p = 0.86				
Insect Scouting Method Used				
Paid Scout	5	8.3	64	35.4
Personal Observation	53	88.3	109	60.2
Other	2	3.3	8	4.4
TOTAL	60	100.0	181	100.0
Chi square test $x^2 = 16.92$; d.f. = 2; p < 0.01				
Frequency of Insect Scouting				
Under Once Per Week	15	24.6	44	25.1
Once Per Week	33	57.4	116	66.3
Over Once Per Week	11	18.0	15	8.6
TOTAL	61	100.0	175	100.0
Chi square test $x^2 = 4.24$; d.f. = 2; p = 0.12				
DEFOLIATION				
Used Chemical Defoliation				
No	14	23.0	39	21.5
Yes	47	77.0	142	78.5
TOTAL	61	100.0	181	100.0
Chi square test $x^2 = 0.00$; d.f. = 1; p = 0.96				
Percent of Bolls Open When Defoliation Applied				
Under 50	13	21.3	15	8.28
50-Over	48	78.7	167	91.8
TOTAL	61	100.0	182	100.0
Chi square test $x^2 = 6.43$; d.f. = 1; p = 0.01				

Planting Dates

The variables included in this subsection are: (1) planted April 20-May 10, (2) planted before April 20, and (3) planted after May 10.

Planted April 20-May 10. Over 98.4 percent of the producers with 5 or less Extension contacts planted during the recommended time period compared to 97.3 percent of those with 6 and over Extension contacts. There was no significant relationship between the number of Extension contacts and planting April 20-May 10 according to the chi square test.

Planted before April 20. Only 15.8 percent of the producers with 5 or less Extension contacts and 11.7 percent of those with 6 and over contacts planted before April 20. No significant relationship existed between the number of Extension contacts and planting before April 20 when tested by the chi square test.

Planted after May 10. Twenty-three percent of producers with 5 or less Extension contacts and 33.0 percent of those with 6 and over Extension contacts planted after May 10. There was no significant relationship between the number of Extension contacts and planting after May 10 according to the chi square test.

Seed Type Planted

The variables included in this subsection are: (1) drilled--machine-delinted seed, (2) drilled--acid-delinted seed, (3) hill dropped--machine-delinted seed, and (4) hill dropped--acid-delinted seed.

Drilled--machine-delinted seed. Only 3.8 percent of the producers with 6 and over Extension contacts drilled machine-delinted seed; whereas, no producers with 5 or less contacts did. According to the chi square test, no significant relationship existed between the number of Extension contacts and use of the practice of drilling machine-delinted seed.

Drilled--acid-delinted seed. Drilling acid-delinted seed was practiced by 91.8 percent of producers with 5 or less Extension contacts and 92.9 percent of those with 6 and over contacts. There was no significant relationship, when tested by the chi square test, between the number of Extension contacts and use of the practice of drilling acid-delinted seed.

Hill dropped--machine-delinted seed. Hill dropping machine-delinted seed was not practiced by 93.4 percent of those with 5 or less contacts and 87.4 percent of those with 6 and over contacts. There was no significant relationship between the number of Extension contacts and use of the practice of hill dropping machine-delinted seed according to the chi square test.

Hill dropped--acid-delinted seed. Only 8.2 percent of the producers with 5 or less Extension contacts and 4.4 percent of those with 6 and over contacts practiced hill dropping acid-delinted seed. No significant relationship existed between the number of Extension contacts and use of the practice of hill dropping acid-delinted seed when tested by the chi square test.

Method of Planting

The variables included in this subsection are: (1) drilled, (2) hill dropped, and (3) replanted.

Drilled. Drilling cotton was the planting method used by 90.2 percent of the producers with 5 or less Extension contacts and 95.6 percent of those with 6 and over contacts. According to the chi square test, there was no significant relationship between the number of Extension contacts and use of the practice of drilling cotton seed.

Hill dropped. Only 9.8 percent of the producers with 5 or less Extension contacts hill dropped compared to 3.8 percent of those with 6 and over contacts. When tested by the chi square test, there was no significant relationship between the number of Extension contacts and use of the practice of hill dropping cotton seed.

Replanted. Replanting was done by 1.6 percent of those with 5 or less contacts and 7.7 percent of those with 6 and over Extension contacts. There was no significant relationship between the number of Extension contacts and use of the practice of replanting when tested by the chi square test.

Seedling Disease Control

The variables included in this subsection are: (1) type material used--seed, (2) used soil treatment, (3) fungicide only--soil, (4) fungicide plus insecticide--soil, and (5) method used--soil.

Type material used--seed. Only 5.1 percent of producers with 5 or less Extension contacts used fungicide only compared to 5.1 percent

of producers with 6 and over contacts. Almost 95 percent of producers with 5 or less contacts and 94.9 percent of producers with 6 and over contacts used a fungicide plus insecticide. No significant relationship existed between the number of Extension contacts and the type material used for seedling disease control according to the chi square test.

Used soil treatment. Soil treatment was used by 36.1 percent of the producers with 5 or less contacts and 44.2 percent of those with 6 and over Extension contacts. There was not a significant relationship, when tested by the chi square test, between the number of Extension contacts and the use of soil treatment for seedling disease control.

Fungicide only--soil. Almost 23 percent of producers with 5 or less Extension contacts used a fungicide only compared to the 16.2 percent of producers with 6 and over contacts who used a fungicide only. There was no significant relationship between the number of Extension contacts and the use of a fungicide alone for seedling disease control when tested by the chi square test.

Fungicide plus insecticide--soil. A fungicide plus insecticide was used by 32.6 percent of producers with 5 or less Extension contacts and 58.2 percent of those with 6 or more contacts. There was a significant relationship, when tested by the chi square test, between the number of Extension contacts and the use of a fungicide plus insecticide for seedling disease control. Producers with more Extension contacts were more likely to use a fungicide plus insecticide than producers with fewer Extension contacts.

Method used--soil. Among the 23 producers with 5 or less Extension contacts responding, 21.7 percent used a hopper-box dust and 78.3 percent used an in-furrow application. Among the 83 producers responding with 6 and over Extension contacts, 9.6 percent used a hopper-box dust and 90.4 percent used an in-furrow application. When tested by the chi square test, there was no significant relationship between the number of Extension contacts and the method used for seedling disease control.

Diseases

The variables found in this subsection are: (1) verticillium wilt--was this a problem?, and (2) used wilt resistant variety.

Verticillium wilt--was this a problem?. Verticillium wilt was not a problem for 85.2 percent of those producers with 5 or less contacts and 86.7 percent of those with 6 and over contacts. There was no significant relationship between the number of Extension contacts and the problem of verticillium wilt when tested by the chi square test.

Used wilt-resistant variety. Slightly over 62 percent of those with 5 or less contacts and 48.2 percent of the producers with 6 and over contacts used a wilt resistant variety. There was no significant relationship between the number of Extension contacts and the use of a wilt-resistant variety according to the chi square test.

Fertilization

The variables included in this subsection are: (1) fertilized according to soil test, (2) limed by soil test, (3) pounds of nitrogen applied per acre-upland, (4) pounds of nitrogen applied per acre-

bottomland, (5) pounds of phosphate per acre without soil test, (6) pounds of potash per acre without soil test, and (7) pounds of boron per acre without soil test.

Fertilized according to soil test. Of those producers with 5 or less contacts, 44.3 percent fertilized according to soil test compared to 72.5 percent of those with 6 and over contacts. According to the chi square test, there was a significant relationship between the number of Extension contacts and fertilizing according to soil test. Producers with more contacts were more likely to fertilize according to soil test than were producers with less contact.

Limed by soil test. Lime was applied according to soil test by 39.3 percent of the producers with 5 or less Extension contacts and 46.7 percent of the producers with 6 and over contacts. There was not a significant relationship between the number of Extension contacts and use of the practice of liming by soil test when tested by the chi square test.

Pounds of nitrogen applied per acre-upland. Seventy-five pounds or less of nitrogen was applied by 26.2 percent of producers making 5 or less contacts and 21.4 percent of those making 6 and over contacts. Just under 10 percent of those with 5 or less contacts and 28.6 percent of producers with 6 and over contacts applied 76.85 pounds while 63.9 percent of those with 5 or less contacts and 50.0 percent of those with 6 and over contacts applied at least 86 pounds of nitrogen. According to the chi square test, there was a significant relationship between the number of Extension contacts and the amount of nitrogen applied per

acre-upland. Producers with 6 or more Extension contacts were more likely than producers having less Extension contacts to apply at least 76 pounds of nitrogen per acre to the upland fields.

Pounds of nitrogen applied per acre-bottomland. Under 60 pounds of nitrogen per acre was applied by 18.0 percent of the producers with 5 or less contacts and 19.2 percent of those with 6 and over contacts. Sixty pounds of nitrogen was applied by 24.6 percent of the producers making 5 or less contacts and 21.4 percent of those having 6 and over contacts. Over 57 percent of those having 5 or less contacts and 59.4 percent of those with 6 and over contacts applied 61 or more pounds. There was no significant relationship between the number of Extension contacts and the amount of nitrogen applied per acre-bottomland according to the chi square test.

Pounds of phosphate per acre without soil test. Almost 61 percent of the respondents with 5 or less contacts applied 20-60 pounds while 68.1 percent of those with 6 and over contacts applied the same amount. Slightly over 39 percent of those with 5 or less contacts and 31.9 percent of those with 6 and over contacts applied 61 or more pounds of phosphate. There was no significant relationship between the number of Extension contacts and the amount of phosphate per acre without a soil test according to the chi square test.

Pounds of potash per acre without soil test. Only 13.7 percent of producers with 5 or less contacts and 13.4 percent of those with 6 and over contacts applied 12-59 pounds. From 60 to 165 pounds was applied

by 35.3 percent of those responding with 5 or less contacts and 40.3 percent of those with 6 and over contacts. Fifty-one percent of those responding with 5 or less contacts and 46.3 percent of those with 6 and over contacts reported applying 166 or more pounds. When tested by the chi square test, there was no significant relationship between the number of Extension contacts and the amount of potash applied per acre without a soil test.

Pounds of boron per acre without soil test. No boron was applied without a soil test by 45.9 percent of producers with 5 or less contacts and 39.0 percent of those with 6 and over contacts. One pound was applied by 32.8 percent of those with 5 or less contacts and 31.3 percent of those with 6 and over contacts. Three pounds were applied by 4.9 percent of those responding with 5 or less contacts and 11.5 percent of those with 6 and over contacts while 4 pounds were applied by 16.4 percent of those with 5 or less contacts and 18.1 percent of those making 6 and over contacts. When tested by the chi square test, there was no significant relationship between the number of Extension contacts and the number of pounds of boron applied per acre without a soil test.

Weed Control

The variables included in this subsection are: (1) used rotation with corn or soybeans to control weeds, (2) used rotary hoeing, (3) used cultivation, (4) applied preplant chemical to control weeds, (5) applied pre-emergence chemical to control weeds, (6) applied post-directed chemical to control weeds, and (7) major weed problem.

Used rotation with corn or soybeans to control weeds. Rotation to another crop was used by 67.2 percent of those with 5 or less contacts and 80.2 percent of those with 6 and over contacts. There was no significant relationship between the number of Extension contacts and the use of crop rotation as a weed control measure when tested by the chi square test.

Used rotary hoeing. Rotary hoeing for weed control was used by 4.9 percent of producers with 5 or less contacts with Extension and 4.4 percent of those with 6 and over contacts. No significant relationship existed, according to the chi square test, between the number of Extension contacts and the use of rotary hoeing for weed control.

Used cultivation. Cultivation for weed control was used by 98.4 percent of the producers with 5 or less contacts and 98.4 percent of those with 6 and over contacts. According to the chi square test, there was no significant relationship between the number of Extension contacts and the use of cultivation for weed control.

Applied preplant chemical to control weeds. Preplant chemicals were used to control weeds by 80.3 percent of producers with 5 or less contacts and 85.2 percent of those with 6 and over contacts. There was no significant relationship between the number of Extension contacts and the use of preplant chemicals for weed control according to the chi square test.

Applied pre-emergence chemical to control weeds. Pre-emergence chemicals were used by 90.2 percent of the producers with 5 or less

contacts and 85.2 percent of those with 6 and over contacts. There was no significant relationship between the number of Extension contacts and the use of pre-emergence chemicals for weed control when tested by the chi square test.

Applied post-directed chemical to control weeds. Weed control with post-directed chemicals was used by 55.7 percent of the producers making 5 or less contacts and 54.9 percent of those having 6 and over contacts. No significant relationship existed between the number of Extension contacts and the use of post-directed chemicals for weed control according to the chi square test.

Major weed problem. Grasses were the major weed problem for 11.5 percent of those with 5 or less contacts and 13.3 percent of those with 6 and over contacts. Broadleaf weeds were the major problem for 88.5 percent of those with 5 or less contacts and 86.7 percent of the producers with 6 and over contacts. According to the chi square test, there was no significant relationship between the number of Extension contacts and the major weed problem.

Insect Control

The variables included in this subsection are: (1) aphids, (2) stink bugs, (3) cutworms, (4) plant bugs, (5) thrips, (6) whitefly, (7) boll weevil, (8) boll worm, (9) boll worm eggs, (10) spider mites, (11) insect scouting method used, and (12) frequency of insect scouting.

Aphids. Aphid control was not needed by 68.9 percent of those having 5 or less contacts and 77.2 percent of those with 6 and over

contacts. There was no significant relationship, according to the chi square test, between the number of Extension contacts and the need for control of aphids.

Stink bugs. Stink bug control was not needed by 85.2 percent of the producers with 5 or less Extension contacts and 89.9 percent of those with 6 and over contacts. When tested by the chi square test, there was no significant relationship between the number of Extension contacts and the need for control of stink bugs.

Cutworms. Cutworm control was not needed by 93.4 percent of those producers with 5 or less contacts and 99.4 percent of those with 6 and over contacts. When tested by the chi square test, there was a significant relationship between the number of Extension contacts and the need for control of cutworms. Producers with more Extension contacts were more likely to not need a control for cutworms than were smaller producers.

Plant bugs. Control for plant bugs was not necessary for 45.9 percent of those making 5 or less contacts and 44.2 percent of those with 6 and over contacts. No significant relationship existed between the number of Extension contacts and the need for control of plant bugs when tested by the chi square test.

Thrips. Thrips control was not needed by 45.9 percent of the producers with 5 or less contacts and 50.0 percent of those with 6 and over contacts. According to the chi square test, there was no significant relationship between the number of Extension contacts and the need for control of thrips.

Whitefly. Whitefly control was not necessary for 96.7 percent of those having 5 or less contacts with Extension and 97.8 percent of those with 6 and over contacts. There was no significant relationship, when tested by the chi square test, between the number of Extension contacts and the need for whitefly control.

Boll weevil. Boll weevil control was not needed for 62.3 percent of those producers having 5 or less contacts and 62.0 percent of those with 6 and over contacts. According to the chi square test, there was no significant relationship between the number of Extension contacts and the need for boll weevil control.

Boll worm. Over 49 percent of the producers with 5 or less contacts did not need a control for boll worms compared to 47.5 percent of those with 6 and over contacts. No significant relationship existed, according to the chi square test, between the number of Extension contacts and the need for boll worm control.

Boll worm eggs. Almost 74 percent of the producers having 5 or less Extension contacts and 68.9 percent of those with 6 and over contacts did not need a control for boll worm eggs. When tested by the chi square test, there was no significant relationship between the number of Extension contacts and the need for control of boll worm eggs.

Spider mites. Spider mite control was not needed by 95.1 percent of those producers with 5 or less contacts and 96.7 percent of the producers with 6 and over contacts. No significant relationship existed, according to the chi square test, between the number of Extension contacts and the need for control of spider mites.

Insect scouting method used. A paid scout was used by 8.3 percent of those having 5 or less contacts and 35.4 percent of those with 6 and over contacts. Personal observations were used by 88.3 percent of those with 5 or less contacts compared to only 60.2 percent of those with 6 and over contacts. Some other method was employed by 3.3 percent of those with 5 or less contacts and 4.4 percent of those with 6 and over contacts. According to the chi square test, there was a significant relationship between the number of Extension contacts and the insect scouting method used. Producers with more contacts were more likely to use a paid scout than producers with less Extension contacts.

Frequency of insect scouting. Scouting less than once per week was done by 24.6 percent of those producers having 5 or less contacts and 25.1 percent of those with 6 and over contacts. A frequency of once per week was used by 57.4 percent of those with 5 or less contacts and 66.3 percent of those with 6 and over contacts. Eighteen percent of those with 5 or less contacts and 8.6 percent of those with 6 and over contacts scouted more than once per week. When tested by the chi square test, there was no significant relationship between the number of Extension contacts and the frequency of insect scouting.

Defoliation

The variables included in this subsection are: (1) used chemical defoliation, and (2) percent of bolls open when defoliant applied.

Used chemical defoliation. Chemical defoliation was used by 77.0 percent of those having 5 or less contacts and 78.5 percent of those having 6 and over contacts. When tested by the chi square test, there

was no significant relationship between the number of Extension contacts and the use of chemical defoliation.

Percent of bolls open when defoliant applied. Almost 79 percent of the producers with 5 or less Extension contacts and 91.8 percent of those with 6 and over contacts applied defoliant when at least 50 percent of the bolls were open. According to the chi square test, there was a significant relationship between the number of Extension contacts and the percent of bolls open when defoliation was applied. Producers with more contacts were more likely than producers with 5 or less contacts to apply defoliant when at least 50 percent of the bolls were open.

Table Summary

A significant relationship existed between the total number of contacts producers had with Extension and use of 6 of the 46 selected cotton production practices.

Of the selected production practices concerning seedling disease control, only the practice of applying a fungicide plus insecticide was significantly related to the number of contacts producers had with Extension. Producers with more Extension contacts were more likely than the producers with fewer contacts with Extension to use a fungicide plus insecticide for seedling disease control.

Among the selected production practices concerning fertilization and liming, only the practices of fertilizing according to soil test and the number of pounds of nitrogen applied per acre-upland were significantly related to the number of contacts producers had with Extension. Again, producers with more Extension contacts were more likely to use the practices than were the smaller producers.

Use of the weed control practices were not significantly related to the number of contacts with Extension.

Use of two of the insect control practices were significantly related to the number of contacts producers had with Extension. The need for cutworm control and the insect scouting method used were significantly related to the number of contacts with Extension. Producers with more Extension contacts were more likely to employ a paid scout than were smaller producers.

There was also a significant relationship between the percent of bolls open when chemical defoliant was applied and the number of Extension contacts. Producers with more contacts were more likely to apply defoliant when 50 percent or more of the bolls were open than were the smaller producers.

Although not significantly related, it was noted that almost all producers planted cotton during the recommended time period of April 20-May 10. Also of interest, although not significant, producers with more contacts with Extension tended to use some type of soil treatment for seedling disease control more often than producers with less contacts.

Producers with more contacts tended more often than those with fewer contacts to apply lime according to soil test and also to use rotation with corn or soybeans to control weeds.

CHAPTER IV

SUMMARY OF MAJOR FINDINGS

I. PURPOSE AND SPECIFIC OBJECTIVES

Purpose

The purpose of this study was to obtain information that might be useful in the development of Extension's plans and programs for Tennessee cotton producers. An additional purpose of this study was to characterize cotton production in Tennessee and to identify variables related to the use of selected cotton production practices.

Specific Objectives

1. To characterize Tennessee cotton producers as to their farm operation, their Extension contacts and their use of selected recommended cotton production practices.
2. To determine the relationship between yield per acre and the producers use of selected recommended production practices.
3. To determine the relationship between the number of acres harvested and selected production practices used by Tennessee cotton producers.
4. To determine the relationship between the number of contacts cotton producers had with Extension over a 12 month period and their use of selected recommended cotton production practices.

II. METHODS OF INVESTIGATION

Population and Sample Studies

The population of this study included all cotton producers in 11 West Tennessee counties and 2 Middle Tennessee counties. Data were obtained through personal interviews of 243 producers by Extension agents using interview schedules developed by Specialists at the University of Tennessee. The "Nth" number technique was used to randomly select individuals to be included in this study.

The recommended sample size for each county was as follows:

1. Counties producing 2,500 to 10,000 acres annually interviewed 15 producers.
2. Counties producing 10,000 to 25,000 acres annually interviewed 20 producers.
3. Counties producing over 25,000 acres annually interviewed 25 producers.

Survey Instrument

The 1987 Cotton Production Survey was developed by the University of Tennessee Agriculture Extension Specialist Staff in the Plant and Soil Science and Agriculture and Extension Education Departments. Questions dealt primarily with the use of production and marketing practices, the number and type of contact producers had with Extension agents, size of the cotton operation, and personal data.

Method of Analysis

Completed survey forms were mailed to the Agriculture and Extension Education Department at the University of Tennessee. Computation and

statistical analysis were made using the University of Tennessee Computing Center facilities and the SPSS-X statistical package.

Responses to the survey questions were summarized using means and frequency counts of the responses from the producers regarding the use of selected production practices and the total number of acres harvested and the mean yields per acre of cotton.

The chi square test and one-way analysis of variance were used to determine the relationship between dependent and independent variables. Statistical tables were used to determine the significance of the observed relationships. F -values and chi square values achieving the .05 level of probability were judged to be significant.

III. FINDINGS

The findings presented in this study are organized according to the study objectives and the tables presented in earlier sections.

Characteristics of Cotton Production in Tennessee

Findings revealed that most producers planted Deltapine 55 variety and that most producers planted 3 or more varieties. A combination of tillage equipment was the major equipment used in seedbed preparation. Over one-half of the producers reported making 1 to 4 tillage trips. Over 98 percent of the producers used certified seed on at least part of their acreage. Over 97 percent of those producers surveyed planted at least part of their cotton between April 20 and May 10. Less than 12 percent of the producers planted cotton before April 20 and only 30.5 percent of the producers report planting after May 10. Almost

93 percent of the producers reported drilling acid-delinted seed while only 2.9 percent drilled machine-delinted seed, 11.1 percent hill dropped machine-delinted seed, and 5.3 percent hill dropped acid-delinted seed. Cotton was drilled by 94.2 percent of the producers. Only 6.2 percent of the producers replanted any cotton.

Over 99 percent of the producers used a seed treatment for seedling disease control. Almost 95 percent used a fungicide plus insecticide. A soil treatment for seedling disease control was used by 42.0 percent of the producers, of which 51.2 percent reported using a fungicide plus insecticide. Among those producers using a soil treatment, 87.7 percent used an in-furrow application. Verticillium wilt was not a problem for 86.4 percent of the producers. Over one-half of the producers planted a wilt-resistant variety.

Over 65 percent of the producers fertilized by soil test. Lime was applied according to soil test by 44.9 percent of the producers. Over 53 percent of the producers applied 86 or more pounds of nitrogen per acre on upland soils. On bottomland soils, 58.8 percent of the producers applied 61 or more pounds of nitrogen per acre. Without a soil test, 65.9 percent of the producers applied between 20 and 60 pounds of phosphate per acre, 47.6 percent of the producers applied at least 166 pounds of potash per acre, 67.1 percent of the producers did not apply any lime, and 59.3 percent of the producers applied boron. Over 99 percent of the producers reported no problem with manganese toxicity.

To control weeds, 77.0 percent of the producers rotated cotton with soybeans or corn, 95.5 percent used rotary hoeing, 98.3 percent

used cultivation, 84.0 percent applied preplant chemical, 86.4 percent applied pre-emergence chemical, and 55.1 percent applied post-directed chemicals. Broadleaf weeds were the major weed problem faced by 87.1 percent of the producers.

A majority of producers reported insect control was not needed for aphids, stink bug, cutworm, whitefly, boll weevil, boll worm eggs, and spider mites. Over 98 percent of the producers did not use boll weevil diapause control. Over 67 percent of the producers reported that personal observation was the method used for insect scouting. Sixty-four percent of the producers reported scouting for insects once per week. Over 78 percent of the producers used chemical defoliation.

Defoliant was applied when 50 percent or more of the bolls were open by 88.5 percent of the producers. Seventy-nine percent of the producers owned a cotton picker. Only 21.3 percent of the producers did custom picking. Over 58 percent of the producers reported harvesting over 200 acres. Almost 83 percent of the producers reported harvesting between 480 and 959 pounds of lint per acre.

Almost 72 percent of the producers reported (in the last 12 months) attending at least one Extension cotton meeting, 27.6 percent attended 2 other Extension meetings, 40.4 percent had made 4 or more visits to the Extension office, 49.4 percent had made 4 or more telephone calls to the Extension office, and 44.9 percent had received 4 or more farm visits from Extension agents.

Relationships Between Tennessee Cotton Producers Use
of Selected Cotton Production Practices and Yield
Per Acre

Findings revealed a significant relationship between mean yield per acre and the use of 18 out of 54 selected production practices by cotton producers. The variety planted and the major equipment used in seedbed preparation were significantly related to the mean yield per acre. Planting in the recommended time period, April 20-May 10, was significantly related to the mean yield per acre with producers planting in this period having significantly higher yields per acre than other producers.

The type of material used for seed treatment, the use of a soil treatment, and the use of a fungicide plus insecticide for seedling disease control were significantly related to the mean yield per acre. Four of the fertilization practices were significantly related to the mean yield per acre. Those practices were: (1) fertilized according to soil test, (2) limed by soil test, (3) pounds of nitrogen applied per acre-upland, and (4) pounds of boron per acre without soil test. Producers fertilizing and liming according to soil test were more likely to have significantly higher mean yields per acre than those not using a soil test.

Producers who used a paid scout or some "other" insect scouting method were more likely to have higher mean yields than those producers who used personal observation to scout for insects. Also, producers whose fields were scouted once per week had a significantly higher yield than those who scouted more or less frequently.

The use of chemical defoliation was significantly related to mean yield per acre. Producers who used chemical defoliation had significantly higher yields than those who did not.

Relationships Between the Number of Acres Harvested
and Selected Production Practices Used by Tennessee
Cotton Producers

Findings revealed a significant relationship between the number of acres harvested and use of 19 out of 52 selected production practices by cotton producers. The number of varieties planted was significantly related to the number of acres harvested. Larger producers were more likely to plant two or more varieties of cotton than were smaller producers. All of the selected practices related to planting dates were significantly related to the number of acres harvested. Larger producers were more likely to plant in the recommended time period of April 20-May 10 and also to plant in the earlier and later time periods than were smaller producers. Among the practices related to planting methods and rates, only drilling acid-delinted seed was significantly related to the number of acres harvested. Larger producers were more likely to drill acid-delinted seed than were smaller producers.

The number of acres harvested was significantly related to the type of material used for seed treatment, the use of a soil treatment, use of fungicide, and the use of a fungicide plus insecticide for seedling disease control. Again, the larger producers were more likely to use these practices than were the smaller producers.

Each of the selected fertilization and liming practices were significantly related to the number of acres harvested except for: (1) pounds of phosphate per acre without soil test, (2) pounds of potash per acre without soil test, and (3) pounds of boron per acre without soil test, with larger producers more likely to use the recommended practices. Also the use of rotation with corn or soybeans to control weeds and the use of post-directed chemical to control weeds were significantly related to the number of acres harvested. Larger producers were significantly more likely to use these practices than smaller producers.

Among the selected insect control practices, only stink bug control and the frequency of insect scouting were significantly related to the number of acres harvested. Larger producers were more likely to scout once per week than were smaller producers.

The use of chemical defoliation was significantly related to the number of acres harvested as was ownership of a cotton picker. Larger producers were more likely to use chemical defoliation and to own a cotton picker than were the smaller producers.

Relationships Between the Number of Extension Contacts and Selected Production Practices Used by Tennessee Cotton Producers

Findings revealed a significant relationship between the total number of contacts producers had with Extension and use of 6 of the 46 selected cotton production practices.

For seedling disease control, only the practice of applying a fungicide plus insecticide was significantly related to the number of

contacts producers had with Extension. Producers with more Extension contacts were more likely than the producers with fewer contacts with Extension to use a fungicide plus insecticide for seedling disease control.

Among the selected production practices concerning fertilization and liming, only the practices of fertilizing according to soil test and the number of pounds of nitrogen applied per acre-upland were significantly related to the number of contacts producers had with Extension. Once again, producers with more Extension contacts were more likely to use the practice than were producers with less contacts.

Two of the insect control practices were significantly related to the number of contacts producers had with Extension. The need for cutworm control and the insect scouting method used were significantly related to the number of contacts with Extension. Producers with more Extension contacts were more likely to employ a paid scout than were producers with less contacts.

There was also a significant relationship between the percent of bolls open when chemical defoliant was applied and the number of Extension contacts. Producers with more contacts were more likely to apply defoliant when 50 percent or more of the bolls were open than were producers with less contacts.

Although not significantly related, it was noted that almost all producers planted cotton during the recommended time period of April 20-May 10. Also of interest, although not significant, producers with more contacts with Extension tended to use some type of soil treatment for seedling disease control more often than producers with less contacts.

Producers with more contacts with Extension tended more often than those with fewer contacts to apply lime according to soil test and also to use rotation with corn or soybeans to control weeds.

IV. IMPLICATIONS AND RECOMMENDATIONS

Based upon findings of this study, the implications and recommendations are stated as follows:

1. Over one-half of the producers did not lime according to soil test. Over one-third of the producers did not fertilize according to soil test. Producers who fertilized and limed according to soil test had significantly higher yields than those producers who did not follow a soil test. This would indicate that emphasis continue to be placed on educating producers about the need to soil test and to fertilize and lime according to soil test.

2. Over two-thirds of the producers used personal observation to scout for insects. Producers who used a paid scout to scout for insects had significantly higher yields than those producers who used personal observation. This would seem to indicate a need for Extension to educate producers as to the proper way to scout for insects or to use Extension trained scouts.

3. The larger producers were significantly more likely than the smaller producers to use rotation with corn or soybeans and to use post-directed chemical to control weeds. Extension agents should emphasize the importance of these practices to smaller producers. Smaller producers should be encouraged to use rotation, where possible, to control weeds.

4. Producers with more Extension contacts were significantly more likely to apply chemical defoliant when 50 percent or more of the bolls were open than were the smaller producers. A continuing emphasis should be made to make all producers aware of the importance of proper timing of application.

V. RECOMMENDATIONS FOR FURTHER STUDY

1. Program emphasis should be placed on reaching all producers and making them aware of study findings.

2. A similar study should be conducted at a later date and compared to this study, to determine if Tennessee cotton producers are increasing their use of recommended practices set forth by the University of Tennessee and to help the Extension Service modify its teaching methods and educational programs.

3. The survey method of collecting data is only as good as the person collecting the data and the instrument. Extension specialists should continue to improve the survey instruments and procedures. Variables need to be specific and easily understood by the interviewer and the respondent.

Order
No. 100-100
100-100-100
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BIBLIOGRAPHY

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APPENDIX

1987 Cotton Production Survey*
(See Instructions on Last Page)
 Card No. $\frac{1}{(1)}$
 Year $\frac{8}{(5)} \frac{7}{(6)}$

 County $\frac{\quad}{(2)} \frac{\quad}{(3)} \frac{\quad}{(4)}$

A. General Cotton Production Information

- (7-10) _____ 1. Acres cotton planted in 1987? (acres)
 (11-14) _____ 2. Acres cotton harvested in 1987? (acres)
 (15-18) _____ 3. Average per acre cotton yield in 1987? (pounds lint/acre)
 (19-22) _____ 4. Acres scouted by trained scout? (acres scouted)

B. Land Preparation

- (23) _____ 1. Major equipment used? (1 = Moldboard plow; 2 = disk; 3 = Chisel plow; 4 = do-all; 5 = combination; 6 = other)
 (24) _____ 2. Average number of times land tilled? (number of trips over fields before planting)

C. Varieties Planted

- (25) _____ 1. Number of different varieties planted? (varieties)
 (26-27) _____ 2. Major variety? (1 = Coker 208; 2 = Deltapine 50; 3 = DES 422; 5 = McNair 220; 6 = McNair 235; 7 = Tifcot 56; 10 = Stoneville 506; 11 = Stoneville 825; 12 = other)
 (28) _____ 3. Certified seed used? (1 = none; 2 = part; 3 = all)

D. Planting Date

- (29-31) _____ 1. Acres planted between April 20 and May 10? (acres)
 (32-34) _____ 2. Acres planted before April 20? (acres)
 (35-37) _____ 3. Acres planted after May 10? (acres)

E. Planting Rate

- (38-39) _____ 1. Drilled: pounds per acre (99 = DNA)
 a. Machine-delinted seed? (pounds/acre)
 (40-41) _____ b. Acid-delinted seed? (pounds/acre)
 (42-43) _____ 2. Hill Dropped: pounds per acre (99 = DNA)
 a. Machine-delinted seed? (pounds/acre)
 (44-45) _____ b. Acid-delinted seed? (pounds/acre)

F. Method of Planting (999 = DNA)

- (46-48) _____ 1. Acres drilled? (acres)
 (49-51) _____ 2. Acres hill dropped? (acres)
 (52-54) _____ 3. Acres replanted in 1987? (acres)

*Coding Instructions

1. Each card column (e.g. (1)) must be filled with a number between zero (0) and nine (9).
2. A card column can contain only one (1) number.
3. Entries in columns must be right justified (e.g. $\frac{0}{(7)} \frac{1}{(8)} \frac{0}{(9)} \frac{0}{(10)} = 100 \text{ acres}$)
4. Empty columns are interpreted as missing data (information not available).
5. A zero (0) = none.
6. A nine (9) in each column = DNA (does not apply); do not know; or no response.

 TAE 416F1a
 Revised 4/87

G. Seedling Disease Control

- (55) _____ 1. Seed treatment? (1 = none; 2 = part; 3 = all of crop)
- (56) _____ a. Material used? (1 = fungicide only; 2 = fungicide plus insecticide; 9 = DNA)
2. Soil treatment:
- (57) _____ a. Acres treated? (1 = none; 2 = less than half; 3 = over half)
- (58) _____ b. Method used? (1 = hopper-box dust; 2 = in-furrow spray; 3 = in-furrow granules; 9 = DNA)
- (59) _____ c. Fungicide only? (1 = none; 2 = less than half; 3 = over half of acres grown)
- (60) _____ d. Fungicide plus insecticide? (1 = none; 2 = less than half; 3 = over half of acres grown)

H. Other Diseases

1. Verticillium wilt

- (61) _____ a. Was this a problem? (1 = no problem; 2 = part; 3 = all of crop)
- (62) _____ b. How severe? (1 = not very severe; 2 = severe; 3 = very severe; 9 = DNA)
- (63) _____ c. Did you use a wilt resistant variety in 1987? (1 = no; 2 = part; 3 = all of crop)

Card No. 2
(1)County No. (2) (3) (4)Respondent No. (5) (6)

I. Fertilization (999 = DNA)

- (7-9) _____ 1. Acres fertilized by soil test? (acres)
- (10-12) _____ 2. Acres limed by soil test? (acres)
3. Pounds of actual nitrogen (N) applied per acre?
- (13-15) _____ a. Upland? (pounds/acre)
- (16-18) _____ b. Bottomland? (pounds/acre)
4. On land not soil tested:
- (19-21) _____ a. Average pounds P_2O_5 applied/acre? (pounds/acre)
- (22-24) _____ b. Average pounds of K_2O applied/acre?
- (25) _____ c. Average tons lime applied/acre? (tons/acre)
- (26) _____ d. Average pounds of boron applied/acre? (pounds/acre)
- (27) _____ 5. Was maganese toxicity a problem in 1983? (1 = no problem; 2 = part; 3 = all of crop)

J. Weed Control

1. Cultural methods:

- (28) _____ a. Rotation with corn or soybeans? (1 = no; 2 = part; 3 = all)
- (29) _____ b. Rotary hoeing? (1 = no; 2 = part; 3 = all of crop)
- (30) _____ c. Cultivation? (1 = no; 2 = part; 3 = all)
- (31) _____ 2. Major weed problem? (1 = grass; 2 = broadleaf)

3

3. Chemical methods:

- (32) _____ a. Applied preplant? (1 = none; 2 = part; 3 = all)
- (33) _____ b. Applied pre-emergence? (1 = none; 2 = part; 3 = all of crop)
- (34) _____ c. Applied post-directed? (1 = none; 2 = part; 3 = all of crop)

K. Insect Control

1. How severe was each of the following insects in 1987?
Note code: (1 = control not needed; 2 = control needed but not applied; 3 = control needed and applied)
- (35) _____ a. Aphids?
- (36) _____ b. Stink bugs?
- (37) _____ c. Cutworms?
- (38) _____ d. Plant bugs?
- (39) _____ e. Thrips?
- (40) _____ f. Whitefly?
- (41) _____ g. Boll Weevil?
- (42) _____ h. Boll Worm?
- (43) _____ i. Boll Worm/egg?
- (44) _____ j. Spider Mites?
- (45) _____ 2. Did you follow a Boll Weevil Diapause control program in the Fall of 1986? (1 = no; 2 = part; 3 = all of crop)
- (46) _____ 3. Method used in 1987 to determine when to treat for insects? (1 = Paid Scout; 2 = personal observation; 3 = other)
- (47) _____ 4. How frequently did you scout for insects? (1 = less than once/week; 2 = once week; 3 = more than once/week; 9 = DNA)

L. Defoliation

- (48) _____ 1. Did you use a chemical defoliant? (1 = none; 2 = part; 3 = all)
- (49-50) _____ 2. When applied? (percent of open bolls when defoliation applied)

M. Harvesting

- (51) _____ 1. Number of pickers owned? (pickers)
- (52) _____ 2. Do you own a 4-row picker? (1 = no; 2 = yes)
- (53-54) _____ 3. Average age of pickers used in 1987? (years old)
- (55) _____ 4. Do you custom pick? (1 = no; 2 = yes; 9 = DNA)
- _____ 5. Rate newest picker used in 1987 on each of the following items: (1 = poor; 2 = fair; 3 = good; 9 = DNA)
- (56) _____ a. Moisture control?
- (57) _____ b. Plugging of picking unit?
- (58) _____ c. Plugging in air stream?
- (59) _____ d. Trash collection around basket?
- (60) _____ e. Stained cotton?
- (61) _____ f. Ease of maintenance?

GENERAL INSTRUCTIONS

Date Due: December, 1987

Disposition: Associate Supervisor

Survey Population: All cotton producers in counties growing at least 2,500 acres of cotton annually.

Counties to be Surveyed: District I - Crockett, Dyer, Fayette, Gibson, Hardeman, Haywood, Lake, Lauderdale, Madison, Shelby and Tipton.
District II - Lincoln.
District III - Franklin.
Other counties also may want to do the survey.

Sample Size:

- a. Counties growing 2,500 to 10,000 acres, interview 15 producers.
- b. Counties growing 10,000 to 25,000 acres, interview 20 producers.
- c. Counties growing over 25,000 acres, interview 25 producers.

Sampling Procedure: Use the Nth number technique.

The Agricultural Extension Service offers its programs
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sex or handicap and is an Equal Opportunity Employer.
E12-2015-00-001-87

COOPERATIVE EXTENSION WORK IN AGRICULTURE AND HOME ECONOMICS

The University of Tennessee Institute of Agriculture, U.S. Department of
Agriculture, and county governments cooperating in furtherance
of Acts of May 8 and June 30, 1914.
Agricultural Extension Service
M. Lloyd Downen, Dean

VITA

James Richard Buntin, the son of Mr. and Mrs. Thomas G. Buntin, was born in Madison County, Tennessee, on June 28, 1960. He grew up in Madison County where he attended elementary school and was graduated from Jackson Central-Merry High School in 1978.

He attended the University of Tennessee at Martin and completed the requirements for a Bachelor of Science Degree in Agriculture Business in 1982.

He was employed as an Assistant Extension Agent in Lauderdale County, Tennessee, in March 1984.

He is married to the former Jayme Ann Nowell of Milan, Tennessee, and they have one daughter, Jennifer Leigh, age three years.