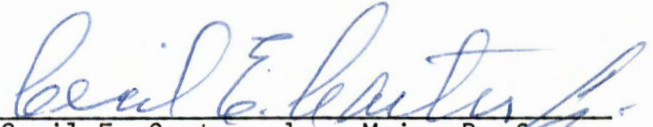


To the Graduate Council:

I am submitting herewith a thesis written by William Gerald Parker entitled "Relationship Between Acres of Tomatoes Grown, Yields Per Acre, Contacts Producers Had with Extension Agents and Selected Characteristics of the Tomato Production Operation of Lauderdale County, Tennessee, Tomato Producers." I have examined the final copy of this thesis for form and content and recommend that it be accepted in partial fulfillment of the requirements for the degree of Master of Science, with a major in Agricultural Extension.

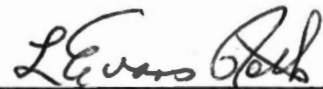

Cecil E. Carter, Jr., Major Professor

We have read this thesis and
recommend its acceptance:





Accepted for the Council:


Vice Chancellor
Graduate Studies and Research

Thesis
83
.P275
cop. 2

RELATIONSHIP BETWEEN ACRES OF TOMATOES GROWN, YIELDS PER ACRE,
CONTACTS PRODUCERS HAD WITH EXTENSION AGENTS AND SELECTED
CHARACTERISTICS OF THE TOMATO PRODUCTION OPERATION OF
LAUDERDALE COUNTY, TENNESSEE, TOMATO PRODUCERS

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

William Gerald Parker

March 1983

3066101

ACKNOWLEDGMENTS

The author acknowledges the assistance given him by his graduate committee, Dr. Cecil Carter, Jr., Dr. Robert Dotson, and Dr. Alvin Rutledge, in the preparation and review of this thesis.

Gratitude is expressed to Dr. W. W. Armistead, Vice President for Agriculture, Institute of Agriculture, The University of Tennessee; Dr. M. Lloyd Downen, Dean, Agricultural Extension Service, The University of Tennessee; Mr. Haywood Luck, District 1 Supervisor; Mr. Charles T. Peal, Extension Leader, Lauderdale County; and the Lauderdale County Agriculture Extension Committee for the encouragement and for granting this study leave. Appreciation is also extended to the Lauderdale County Extension office staff who assisted with the author's work assignments.

Special appreciation is expressed to my wife Elaine, son Brian, and daughter April for their help, love, and understanding during this study.

ABSTRACT

The purpose of the study was to characterize Lauderdale County tomato producers, and to determine the relationship between the number of contacts producers had with the Agricultural Extension agents, acres of tomatoes planted, yields per acre, and their use of recommended tomato production practices. Thirty tomato producers were randomly selected and personal interviews were conducted by County Extension agents. Interview schedules were developed by University of Tennessee Horticulture Specialists and the Agricultural Extension Education Department and agents conducted the survey during the fall of 1980. Information recorded included their use of recommended tomato production practices and the number of contacts producers had with the Extension office over a twelve-month period.

The data were coded and punched on computer cards, and computations were made by The University of Tennessee Computing Center. One-way analysis of variance F -test was used to determine the significance and strength of the relationship between the dependent and independent variables. The .05 probability level was accepted as significant.

Major findings included the following:

1. The producers planted an average of 6.9 acres of tomatoes in 1980 and their average yield was 5.2 tons harvested per acre.
2. Thirty percent of the producers had not attended any Extension meeting; however, over 83 percent of the producers reported Extension as being their primary source of tomato information.

3. Sixty-six percent of the producers did not fertilize by soil test recommendations and 60 percent of the producers did not lime by soil test recommendations.

4. Producers who fertilized and limed by soil test (33.3 percent and 40 percent, respectively) made significantly more contacts with Extension through meetings, office visits, telephone calls, and farm visits than did those producers who did not fertilize and lime by soil test recommendations.

5. The number of Extension contacts (i.e., meetings, visits to the Extension office, telephone calls to the Extension office, and farm visits received from Extension agents) was not significantly related to the variety of tomatoes planted with the exception of tomato production and marketing meetings attended.

6. Producers who applied fungicides to tomatoes before planting them in the field attended significantly more tomato production and marketing meetings and received significantly more farm visits from Extension agents.

7. Producers who applied fungicides more often made significantly more telephone calls to the Extension office.

8. Producers who fertilized and limed by soil test recommendations planted significantly more acres of tomatoes than did those producers who did not use these recommended practices.

9. Producers who applied fungicides to tomatoes before planting them had significantly more yield per acre than did those producers who did not use the practice.

10. Producers who used the greatest number of insecticides had significantly larger yields per acre than the producers who used only one or two insecticides.

Implications and recommendations were also made.

TABLE OF CONTENTS

CHAPTER	PAGE
I. THE PROBLEM AND ITS SETTING	1
Introduction	1
Problem and Need for the Study	3
Purpose of Study	3
Related Studies	4
Limitations of the Study	7
Methods and Procedures	7
II. STUDY FINDINGS	10
Characteristics of Tomato Producers and Their Farm Operation	10
Relationship Between Characteristics of Farm Operation and the Number of Contacts Tomato Producers Had with Extension Agents	33
Relationship Between Tomato Acres Planted, Characteristics of Production, and Production Practices Used	64
Relationship Between Production Characteristics, Production Practices Used, and Tons Sold Per Acre	75
III. SUMMARY OF MAJOR FINDINGS	91
Purpose and Specific Objectives	91
Methods and Procedures	91
Major Findings	93
Implications and Recommendations	108
Recommendations	109
BIBLIOGRAPHY	110
APPENDIX	113
VITA	122

LIST OF TABLES

TABLE	PAGE
I. Characteristics of Tomato Producers and Their Farm Operation	11
II. Relationship Between Selected Characteristics of Tomato Production and the Number of Contacts Tomato Producers Had with Extension Agents Over a 12-Month Time Period	34
III. Relationship Between Tomato Acres Planted and Production Practices Used	65
IV. Relationship Between Production Characteristics, Production Practices Used, and Pounds Sold Per Acre . .	76

CHAPTER I

THE PROBLEM AND ITS SETTING

I. INTRODUCTION

Lauderdale County, located in West Tennessee, is bordered to the west by the Mississippi River, Dyer County to the north, Crockett and Haywood counties to the east, and Tipton County to the south. The county's primary agricultural crop is soybeans.

However, 66 farmers harvested an average of 4.36 acres of vegetables in 1978 according to the 1978 Census of Agriculture (8)* The primary vegetable grown was tomatoes.

A 1980 statewide Extension Service survey, comprised of 13 tomato producing counties in Tennessee, showed that the average acreage for the 179 respondents was seven acres per individual. Approximately 350 acres of tomatoes were planted in Lauderdale County in 1980. The 30 producers surveyed in the county grew an average of 6.9 acres each.

While tomato production represents only a small portion of crop acreage grown, dollar return per acre is very significant for producers. U.S.D.A. statistics for 1978 show a return of 438,735,000 dollars for the 129,250 acres of fresh market tomatoes grown nationally (7:191). Tennessee's 1979 statistics show a cash return of 6,960,000 dollars was realized from the sale of its 3000 acres of tomatoes (6:5)

*Numbers in parentheses refer to alphabetically listed items in the Bibliography; those after the colon refer to page numbers.

or 2,320 dollars per acre. This cash return represented 1.9 percent of the total receipts from sale of crops and livestock in Tennessee. Accurate data regarding gross sales of tomatoes in Lauderdale County were not available for the 1980 crop year. However, sales were estimated to exceed 800,000 dollars.

Tomatoes are a crop that works well for both larger farmers, using them for crop diversification, and smaller farmers who make their living growing vegetable crops. However, tomato acreage has decreased in Lauderdale over the past several years. This acreage decrease may have been influenced by decreasing numbers of farms and increasing intensity of farm operations. Tomatoes also are a high investment and high labor requiring crop. Since farmers have moved toward monoculture cropping situations, a smaller number of farmers are willing to grow tomatoes.

The Agriculture Extension Service is concerned about producers in all phases of agriculture and the County Extension staff continues to try to improve its program to encourage producers to adopt recommended production and marketing practices.

The major concern of this study, therefore, was to find out to what extent tomato producers were using recommended tomato production practices. Efforts were made to characterize the producers as to acres planted, yields per acre, and numbers of contacts producers had with Extension and the relationship between these variables.

II. PROBLEM AND NEED FOR THE STUDY

Tomato production can increase the income of small acreage farmers and help to increase the diversification of larger acreage farmers. This, however, depends primarily on whether or not returns are significantly above costs of production.

Extension agents are aware that not all tomato producers use all of the recommended production practices, therefore there is a continuing need to teach and otherwise encourage the adoption of recommended tomato production and marketing practices. Research and experience indicate that net returns from tomatoes can be increased significantly through the application of recommended practices at specified time and in proper sequence. This study was aimed at determining the extent to which producers in Lauderdale County were using critical recommended practices and to identify producer characteristics related to practice use. It was felt that this information would help Extension agents in Lauderdale County to identify program areas for increased emphasis.

III. PURPOSE OF STUDY

The purpose of the study was to characterize tomato producers as to their type and size of operation, use of recommended tomato production practices, number of Extension contacts, acres planted, yields per acre, and the relationship between these variables.

The specific objectives were:

1. To characterize the tomato producers as to the number and percent that used selected recommended production practices.

2. To determine the relationship between producers use of selected practices and contacts they had with Extension in a twelve-month period.
3. To determine the relationship between number of acres planted and use of selected tomato production practices.
4. To determine the relationship between the per acre yield and use of selected tomato production practices.

IV. RELATED STUDIES

Little research was found on tomato production in Tennessee concerning the effects Extension contacts had had on producers' use of recommended practices, relationships between the type and size of tomato farm operations and the use of recommended practices by tomato producers and the number of contacts producers had with Extension agents. However, several studies of producers of other crops and of livestock and Grade A dairy producers have been completed in Tennessee.

Summaries of these other study findings are reported under the following headings: (1) relationships between characteristics of farming operations and Extension contacts, (2) relationship between number of Extension contacts and use of recommended practices, (3) relationship between characteristics of farming operations and use of recommended practices.

Relationship Between Characteristics of the Farming Operation and Extension Contacts

Pat Freeman found in his 1978 study of Tennessee Grade A dairy producers that the larger farm operators, in terms of cows milked,

attended more Extension meetings and received more Extension contacts than did smaller operators (1).

Mike Gordon found in his 1977 study that the characteristics of Tennessee feeder pig producers' 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 size of operation." Producers who planned to expand the size of their operation attended a larger number of meetings and received more visits from Extension agents than did other producers (2).

DeWayne Perry reported in his 1980 study of Tennessee swine producers that "farrow-to-finish" producers used significantly more of the 14 recommended pig production practices as compared to "feeder pig" producers. Thirteen of the 14 recommended practices were used by significantly more of the "farrow-to-finish" producers than by "feeder pig" producers (5).

In a 1978 study of Tennessee corn producers, Solomon Yabaya's data revealed that corn producers who made more frequent contacts with Extension had significantly more acreage and yield for both silage and grain than did those producers who had fewer contacts (14).

Marcus McLemore found in his 1975 statewide study of Tennessee swine producers that the number of sows farrowing twice per year and the number of pigs raised to weaning were significantly related to the total number of contacts the producers had with Extension agents (4).

Relationship Between Number of Extension Contacts and the Use of Recommended Practices

Gordon's study showed that Haywood County swine producers who were using recommended practices had made a larger number of contacts with Extension than producers who were not using the practices (2).

Jenkins found that the use of recommended soybean production practices was not significantly related to Extension contacts. However, he concluded that nearly all of the producers were already using the practices studied (3).

McLemore's study revealed that the total number of contacts producers had with Extension was significantly related to their use of 23 of the 25 surveys conducted (4).

Yabaya found that corn producers who frequently contacted the Extension agents were using the recommended corn production practices. However, he concluded that the relationship between the use of some of the recommended practices and Extension contacts were not significant at the required .05 probability level. This, he concluded, may have been because a high percentage of the producers were using these practices (14).

Relationship Between Characteristics of Farming Operations and Use of Recommended Practices

Freeman's study showed that Grade A dairymen who had large dairy herds and large farms tended to use significantly more recommended practices than those dairymen with smaller herds and farms (1).

Gordon found that the age of farmers was not significantly related to their adoption of recommended production practices.

However, farmers with college training used a higher percentage of recommended practices than those producers with only a high school education (2).

Jenkins compiled data that revealed soybean producers who farmed larger acreages made a significantly greater number of contacts with Extension than the smaller acreage producers. The larger acreage producers also were using more recommended practices (3).

Perry found that "farrow-to-finish" swine farmers made a significantly larger number of contacts with Extension during a twelve-month period when compared to "feeder pig" producers (5).

Wilson and Gallup, conducting research related to education nation wide, found a significant relationship between the size of farm and the number of recommended practices used by farm producers. Farmers with larger farms used more recommended practices than those with smaller farms (13).

V. LIMITATIONS OF THE STUDY

Comparable studies related to tomato production practices and contacts with the Extension Service were not found. This study will therefore be limited to data available from the 1980 University of Tennessee Agricultural Extension Service Tomato Production Survey conducted in Lauderdale County, Tennessee.

VI. METHODS AND PROCEDURES

This section describes the methods and procedures used to obtain and analyze survey data used in this study.

Population and Sample

The population in this study was all tomato producers in Lauderdale County, Tennessee, who produced at least one-half acre of field tomatoes for sale in 1980. The Nth number technique was used to randomly select individuals to be included in this study. Data were obtained from 30 or about 65 percent of all the tomato producers in this county.

Survey Instrument

The basic interview schedule used to record data from each producer was developed by Extension Specialists in the Plant and Soil Sciences Section at The University of Tennessee. This research added some questions not included in the basic instrument. The instrument was designed for use in personal interviews. Questions dealt primarily with characteristics of the producers and their farm operation, their use of production and marketing practices and the number of contacts of various kinds the producers had with Extension agents. Also, data were obtained regarding the size of their tomato operation as well as pounds of tomatoes sold per acre of tomatoes grown.

Interviews

Interviews were conducted by this researcher during the Fall of 1980 and Spring of 1981.

Analysis of Data

Completed survey forms were mailed to the Agricultural Extension Education Section at The University of Tennessee where data cards were

punched and processed for computer analysis. Data were analyzed using computing equipment at The University of Tennessee, Knoxville. Descriptive statistics were used to summarize the survey data. Statistical tests used to determine the strength of relationships between variables as well as the significance levels included the one-way analysis of variance. The .05 probability level was used to make decisions regarding the significance of observed relationships between variables.

CHAPTER II

STUDY FINDINGS

Findings of this study were organized according to major objectives of the study. Results of data analysis are presented in tables and major findings are presented in four sections of this chapter.

Section I presents study findings regarding the characteristics of (30) Lauderdale County tomato producers and characteristics of their farm operations in 1980.

Section II presents study findings regarding the relationships between the characteristics of farm operations and the number of contacts of various types tomato producers had with Extension agents during the previous 12 months.

Section III presents study findings regarding the relationships between tomato acres planted, characteristics of production, and production practices used by producers in 1980.

Section IV presents study findings regarding the relationships between the tons of tomatoes sold per acre, production characteristics and production practices used by producers in 1980.

I. CHARACTERISTICS OF TOMATO PRODUCERS AND THEIR FARM OPERATION

Table I presents the number and percents of tomato producers by variables which tend to characterize the tomato producers and their

TABLE I
CHARACTERISTICS OF TOMATO PRODUCERS AND THEIR FARM OPERATION

Characteristics of the Tomato Producers and Their Farm Operation	Number of Producers (N=30)	Percent of Producers
<u>Production Characteristics</u>		
Acres in farm		
0-60	11	36.5
61-150	9	29.8
151-750	8	26.4
751-1200	2	6.6
Mean=255 acres in farm		
Farmers major source of farm income		
Vegetables	18	60.0
Row crops	12	40.0
Number of acres planted		
1-3	12	40.0
4-7	9	30.0
8-40	9	30.0
Mean=6.9 acres planted		
Acres of tomatoes owned		
0-3	15	49.9
4-7	9	29.9
8-60	6	19.9
Mean=7.3 acres tomatoes owned		
Acres of tomatoes on rented land		
0	29	96.7
1-4	1	3.3
Mean=0.13 acres tomato land rented		
Acres of tomatoes shared		
0	26	86.7
1	1	3.3
2	1	3.3
3	1	3.3
4-30	1	3.3
Mean=1.2 acres tomato land share rented		

TABLE I (continued)

Characteristics of the Tomato Producers and Their Farm Operation	Number of Producers (N=30)	Percent of Producers
Variety grown		
Floradade	1	3.3
Supersonic	3	16.7
Jet star	2	6.7
Other	22	73.3
Plants gotten from where		
Purchased	3	10.0
Homegrown	27	90.0
How plants grown		
Container	27	90.0
Bareroot	5	10.0
Major labor source		
Family	12	40.0
Hired	18	60.0
<u>Field Fertilization</u>		
Pounds of fertilizer applied per acre		
200-450	8	26.6
451-800	9	30.0
801-1000	11	36.7
1001-2000	2	6.6
Mean=787 pounds fertilizer applied per acre		
Fertilizer applied by soil test		
No	20	66.7
Yes	10	33.3
How fertilizer was applied		
Banded	11	36.7
Broadcast	19	63.3
Pounds of nitrogen applied at planting		
0-60	8	26.4
61-117	8	27.0
118-300	14	46.5
Mean=114 pounds nitrogen applied at planting		

TABLE I (continued)

Characteristics of the Tomato Producers and Their Farm Operation	Number of Producers (N=30)	Percent of Producers
Pounds of phosphate applied at planting		
0-60	8	26.6
61-105	8	26.5
106-130	8	26.6
131-300	6	19.9
Mean=109 pounds phosphate applied at planting		
Pounds of potash applied at planting		
0-84	7	23.1
85-117	7	23.3
118-130	9	30.0
131-300	7	23.2
Mean=115 pounds potash applied at planting		
Times nitrogen applied sidedressed		
0	2	6.7
1	12	40.0
2	14	40.0
3	4	13.3
Mean=1.6 times nitrogen applied sidedressed		
Pounds of nitrogen applied sidedressed		
0-30	11	36.7
30-50	7	23.2
51-60	7	23.3
61-165	5	16.5
Mean=48.2 pounds nitrogen applied sidedressed		
Plant side when nitrogen applied		
First fruit	28	93.3
None applied	2	6.7
Lime applied by soil test		
No	18	60.0
Yes	12	40.0

TABLE I (continued)

Characteristics of the Tomato Producers and Their Farm Operation	Number of Producers (N=30)	Percent of Producers
<u>Weed, Disease, and Insect Control</u>		
Major weed problem		
Cockle bur	2	6.7
Purselane	2	6.7
Spiny Amarantha	2	6.7
Morninglory	24	80.0
Major grass problem		
Johnsongrass	1	3.3
Crabgrass	12	40.0
Goosegrass	17	56.7
How weeds were controlled		
Cultivation	24	80.0
Herbicides	4	13.3
Cultivation and herbicides	2	6.7
Times cultivated		
0-4	13	43.3
5-6	14	46.7
7-9	3	10.0
Mean=4.9 times tomatoes were cultivated		
Primary herbicide used		
Treflan	8	26.7
Sencor	2	6.7
None used	20	66.7
When herbicides were applied		
Before planting	6	20.0
After planting	3	10.0
None used	21	70.0
Percent of crop loss to weeds		
0%	27	90.0
5%	2	6.7
10%	1	3.3

TABLE I (continued)

Characteristics of the Tomato Producers and Their Farm Operation	Number of Producers (N=30)	Percent of Producers
Major disease problem		
Early blight	18	60.0
Blossom end rot	8	26.7
Verticillium wilt	1	3.3
Other	2	6.7
Not any	1	3.3
When fungicide first applied		
Before planting	7	23.3
Soon after planting	21	70.0
Not used	2	6.7
Times fungicide applied		
0-7	15	50.0
8-9	15	50.0
Mean=7.0 times fungicide applied		
Primary fungicide used		
Maneb	16	53.3
Bravo	11	36.7
Methyl bromide	3	10.0
Primary spray method used		
Drop nozzle	17	56.7
Air-blast	6	20.0
Knap-sack	1	3.3
Other	4	13.3
None used	2	6.7
Type pump used		
Piston	1	3.3
Roller	16	53.3
Centrifical	3	10.0
Other	6	20.0
None used	4	13.3
Type nozzles used		
Cone	18	60.0
Flat fan	2	6.7
Fan	3	10.0
Other	3	10.0
None used	4	13.3

TABLE I (continued)

Characteristics of the Tomato Producers and Their Farm Operation	Number of Producers (N=30)	Percent of Producers
Fungicides mixed with insecticides		
No	1	3.3
Yes	29	96.7
Percent crop loss to disease		
0-1	11	36.7
2-8	7	23.3
9-18	5	16.6
19-25	7	23.3
Mean=8.3 percent tomato crop lost to disease		
Most serious insect problem		
Aphids	5	16.7
Cutworms	2	6.7
Fruit worms	23	76.7
Number insecticides used		
1	5	16.7
2	22	73.3
3	2	6.7
5	1	3.3
Mean=2.0 number of insecticides used		
Most frequently used insecticide		
Sevin	5	16.7
Lannate	25	83.3
Times tomatoes sprayed for insects		
0-6	10	33.2
7-8	16	53.4
9-over	4	13.3
Mean=6.9 times tomatoes sprayed for insects		
Percent crop loss to insects		
0-1	12	40.0
2-3	10	33.3
4-10	8	26.7
Mean=2.5 percent of tomato crop lost to insects		

TABLE I (continued)

Characteristics of the Tomato Producers and Their Farm Operation	Number of Producers (N=30)	Percent of Producers
<u>Harvesting and Marketing</u>		
Yield per acre in tons		
0-4	9	30.0
5-6	14	46.6
7-9	7	23.3
Mean=5.2 tons per acre harvested		
Percent harvested green		
0-30	28	93.3
31-60	1	3.3
61-100	1	3.3
Mean=4.4 percent of tomatoes harvested in the green stage		
Percent harvested at breaker stage		
0-60	4	13.3
61-90	5	16.6
91-100	21	70.0
Mean=88.5 percent of tomatoes harvested in the breaker stage		
Percent harvested pink		
0	23	76.7
1-30	4	13.3
31-50	3	10.0
Mean=7.0 percent of tomatoes harvested in the pink stage		
Date of first sale		
6-16—6-22	11	36.6
6-23—6-27	9	30.0
6-28—6-30	10	33.4
Mean=6:24 (June 24) mean date of first sale		
Market tomatoes grown for		
Early	29	96.7
Late	0	0.0
Both	1	3.3
How tomatoes graded		
Shed	30	100.0

TABLE I (continued)

Characteristics of the Tomato Producers and Their Farm Operation	Number of Producers (N=30)	Percent of Producers
Tons tomatoes sold		
0-15	9	32.3
16-30	8	28.7
31-45	7	25.0
46-99	6	14.3
Mean=26 tons of tomatoes sold		
Major market outlet		
Wholesaler-retailer	23	76.7
Store	2	6.7
Farmers' market	5	16.7
Container tomatoes marketed in		
Half-bushel basket	21	70.0
30-pound cardboard box	9	30.0
Major source of marketing information		
Farmers' market	7	23.3
Other farmers	6	20.0
Buyer	16	53.3
Other	1	3.3
Highest price per pound		
29¢-43¢	10	34.3
44¢-50¢	12	41.3
51¢-57¢	8	24.0
Mean=46¢ highest price received		
Percent sold at highest price		
0-5	21	70.0
6-33	9	30.0
Mean=6.5 percent tomatoes sold at highest price		
Lowest price per pound		
0-13¢	10	34.4
14¢-20¢	9	30.9
21¢-25¢	11	34.5
Mean=16.7¢ lowest price received		

TABLE I (continued)

Characteristics of the Tomato Producers and Their Farm Operation	Number of Producers (N=30)	Percent of Producers
<u>Extension Contacts in Last 12 Months</u>		
Primary source of tomato information		
Extension	25	83.3
Other	5	16.7
Extension meetings attended		
0	9	30.0
1	6	20.0
2	4	13.3
3	7	23.3
4	2	6.7
5	2	6.7
Mean=1.81 number of Extension meetings of all types attended during past 12 months		
Extension meetings on tomato production and marketing		
0	8	26.7
1	21	70.0
2	1	3.3
Mean=0.8 number of Extension meetings on tomato production		
Visits made to Extension office		
0	10	33.3
1	3	10.0
2	4	13.3
3	6	20.0
4	4	13.3
5	2	6.7
8	1	3.3
Mean=2.1 number of visits to Extension office		
Telephone calls to Extension office		
0	3	10.0
1	5	16.7
2	5	16.7
3	2	6.7
4	1	3.3
5	8	26.7

TABLE I (continued)

Characteristics of the Tomato Producers and Their Farm Operation	Number of Producers (N=30)	Percent of Producers
Telephone calls to Extension office (continued)		
6	3	10.0
8	2	6.0
Mean=3.6 number of telephone calls to the Extension office		
Farm visits received from Extension agents		
0	5	16.7
1	7	23.3
2	5	16.7
3	3	10.0
4	2	6.7
5	4	13.3
6	3	10.0
10	1	3.3
Mean=2.7 number of farm visits received from Extension agents		

farm operation. The variables are grouped under five major subheadings. They are: (1) production characteristics, (2) field fertilization, (3) weed, disease, insect control, (4) harvesting and marketing, and (5) Extension contacts in 1980. The number and percent of producers are given for each variable. The mean is given where appropriate.

Production Information

Acres in farm. Table I shows that eleven or 36.5 percent of the producers farmed 60 acres or less of land. Nine producers or almost 30 percent farmed between 61 and 150 acres of land. Eight producers or 26.4 percent farmed between 151 and 750 acres of land, and two producers or 6.6 percent farmed between 751 and 1200 acres of land. The mean acres farmed was 255.

Farmers' major source of farm income. Sixty percent or 18 of the 30 producers surveyed derived their major farm income from vegetables. Twelve producers (40 percent) reported row crops as their major source of farm income.

Number of acres planted. Twelve producers (40 percent) planted between 1 and 3 acres of tomatoes. Nine producers (29.9 percent) planted between 4 and 7 acres of tomatoes, and the remaining nine producers (29.9 percent) planted between 8 and 40 acres of tomatoes. Mean acres planted was 6.9.

Acres of tomatoes grown on rented land. Twenty-nine (96.7 percent) producers had no tomatoes on rented land while one producer (3.3 percent) planted between 1 and 4 acres on rented land.

Acres of tomatoes sharecropped. Twenty-six (86.7 percent) of the producers did not sharecrop any of the tomato acres planted. One producer sharecropped two acres, one sharecropped three acres and one sharecropped between 4 and 30 acres of tomatoes. The mean number of acres sharecropped was 1.2.

Variety grown. One producer grew the Floradade variety, five producers grew the Supersonic variety and two producers grew the Jet Star variety. Twenty-two (73.3 percent) of the producers grew varieties other than those mentioned. Eight of the producers grew recommended varieties of tomatoes (12).

Source of plants. Three producers (10 percent) purchased their plants and 27 (90 percent) grew their own plants.

Plants grown in containers or bareroot. Twenty-seven producers (90 percent) grew their own plants in containers while three producers (10 percent) used bareroot plants. Home growing of plants in containers is strongly advocated by The University of Tennessee (12).

Major labor source. Twelve producers (40 percent) reported their family was the major source of labor while 18 (60 percent) used hired help.

Field Fertilization

Pounds of fertilizer applied per acre. Eight producers (26.6 percent) applied between 200 and 450 pounds of fertilizer per acre, nine (30 percent) applied between 451 and 800 pounds, eleven (36.7 percent) applied between 801 and 1000 pounds and 2 (6.6 percent) producers applied between 1001 and 2000 pounds of fertilizer per acre. The mean pounds of fertilizer applied per acre was 787.

Fertilizer applied by soil test. Twenty producers (66.7 percent) did not apply fertilizer by soil test, whereas the other 10 producers (33.3 percent) did apply fertilizer by soil test. The majority of producers did not follow the recommended practice of fertilizing by soil test (12).

How fertilizer was applied. Eleven producers (36.7 percent) applied fertilizer by banding, while the other 19 producers (63.3 percent) broadcast the fertilizer on their tomato land.

Pounds of nitrogen applied per acre at planting. Eight producers (26.4 percent) applied under 60 pounds of nitrogen per acre at planting, another eight applied between 61 and 117 pounds of nitrogen per acre at planting and the remaining 14 producers (46.5 percent) applied between 118 and 300 pounds of nitrogen per acre at planting. The mean pounds of nitrogen applied per acre at planting was 114.

Pounds of phosphate applied per acre at planting. Eight producers (26.6 percent) applied under 60 pounds of phosphate per acre at planting, eight applied from 61 to 105 pounds, and eight more applied between 106 and 130 pounds of phosphate per acre at planting. The remaining six producers (19.9 percent) applied between 131 and 300 pounds of phosphate per acre at planting. The mean pounds of phosphate applied at planting was 105.

Pounds of potash applied at planting. Seven producers (23.1 percent) applied under 85 pounds of potash at planting, seven (23.3 percent) applied between 85 and 117 pounds, and nine (30 percent) applied between 118 and 130 pounds of potash per acre at

planting. The remaining seven producers (23.2 percent) applied from 131 to 300 pounds of potash per acre at planting. The mean pounds of potash applied per acre at planting was 115.

Times nitrogen applied sidedress. Two producers (6.7 percent) did not apply nitrogen by sidedress, twelve (40 percent) sidedressed nitrogen one time, fourteen (40 percent) applied nitrogen sidedressed two times and the other four producers (13.3 percent) sidedressed nitrogen three times. The mean number of sidedressed nitrogen applications was 1.6.

Pounds of nitrogen applied sidedressed. Eleven producers (36.7 percent) applied under 31 pounds of nitrogen per acre sidedressed, seven (23.2 percent) applied between 30 and 50 pounds, seven others (23.3 percent) applied from 51 to 60 pounds and the other five producers (16.5 percent) applied from 61 to 165 pounds of nitrogen per acre sidedressed. The mean pounds of nitrogen sidedressed per acre was 48.2.

Plant size when nitrogen applied. Twenty-eight producers (93.3 percent) applied nitrogen sidedressed when the plants first fruited while the other two producers (6.7 percent) did not sidedress nitrogen. Most of the producers followed the recommended practice regarding when to apply nitrogen sidedressed (12).

Lime applied by soil test. Eighteen producers (60 percent) did not lime by soil test and the remaining twelve producers (40 percent) did lime by soil test. The majority of the producers did not follow the recommended practice of applying lime by soil test (12).

Weed, Disease, and Insect Control

Major weed problem. Cocklebur was the major weed problem for two producers (6.7 percent), two (6.7 percent) had purslane, two producers (6.7 percent) had spiny amaranth, while the remaining 24 producers (80 percent) said morninglory was their major weed problem.

Major grass problem. One producer (3.3 percent) said that johnsongrass was his major grass problem, twelve (40 percent) gave crabgrass as their major grass problem and the other seventeen producers (56.7 percent) said goosegrass was their major grass problem.

Weed control. Twenty-four producers (80 percent) relied on cultivation to control weeds, four (13.3 percent) used herbicides, and the other two producers (6.7 percent) used cultivation and herbicides to control weeds.

Times cultivated. Thirteen producers (43.3 percent) cultivated under 5 times, fourteen (46.7 percent) cultivated from 5 to 6 times and the other three producers (10 percent) cultivated from 7 to 9 times. The mean times cultivated was 4.9.

Primary herbicide used. Eight producers (26.7 percent) used Treflan as the primary herbicide, two (6.7 percent) used Sencor and the other 20 producers (66.7 percent) did not use a herbicide. All ten of the producers who used a herbicide used one that is recommended by The University of Tennessee (9).

When herbicides applied. Six producers (20 percent) applied herbicide before planting, three (10 percent) after planting and 21 (70 percent) did not apply herbicide before or after planting.

Percent crop loss to weeds. Twenty-seven producers (90 percent) reported no crop loss due to weeds, two (6.7 percent) reported 5 percent loss and one producer lost 10 percent of his crop to weeds. The mean percent crop loss to weeds was 0.67.

Major disease problem. Eighteen producers (60 percent) considered Early Blight to be their major disease problem, eight (26.7 percent) Blossom End Rot, one (3.3 percent) Verticillium Wilt, and two producers (6.7 percent) reported other disease problems. One producer did not have any disease problems.

When fungicide first applied. Seven producers (23.3 percent) first applied fungicide before planting. Twenty-one producers (70 percent) applied their first fungicide soon after planting and two (6.7 percent) did not apply a fungicide either before planting or soon after planting.

Times fungicide applied. Fifteen producers (50 percent) applied fungicide under 8 times and the other 15 producers (50 percent) applied fungicide 8 or 9 times. The mean number of times producers applied fungicide was 7.

Primary fungicide used. Sixteen producers (53.3 percent) said Maneb was the major fungicide used, 11 producers (36.7 percent) used Bravo, and the other three producers (10 percent) said Methyl Bromide was the primary fungicide used. All of the producers used a recommended fungicide (10).

Primary spray method used. Seventeen producers (53.3 percent) used drop nozzle sprayers, six (20 percent) used air-blast sprayers,

one (3.3 percent) used a knapsack sprayer, four (13.3 percent) used some other spray method. The other two producers (6.7 percent) did not report a primary spray method.

Type pump used. One producer (3.3 percent) used the piston type of pump, 16 producers (53.3 percent) used a roller pump, three (10 percent) used a centrifical pump, six (20 percent) used other types of pumps. The remaining four producers (13.3 percent) did not use a pump.

Type spray nozzle used. Eighteen producers (60 percent) used a cone type of spray nozzle, two (6.7 percent) used flat fan nozzles, three (10 percent) used fan nozzles and three others (10 percent) used other types of spray nozzles. The remaining four producers (13.3 percent) did not use spray nozzles.

Fungicide mixed with insecticide. One producer (3.3 percent) did not mix fungicides and insecticides. The other twenty-nine producers (96.7 percent) did mix fungicides and insecticides.

Percent crop loss to disease. Eleven producers (36.7 percent) reported losing under 2 percent of their tomato crop to disease, seven (23.3 percent) lost from 2 to 8 percent, five (16.6 percent) lost from 9 to 18 percent, and the other seven producers (23.3 percent) reported losing from 19 to 25 percent of their crop to disease. The mean percentage of tomato crop lost to disease in 1980 was 8.3.

Most serious insect problem. Five producers (16.7 percent) considered aphids their most serious insect problem, two (6.7 percent) cutworms, the remaining 23 producers (76.7 percent) considered fruit worms as their most serious insect problem in 1980.

Number of insecticides used. Five producers (16.7 percent) used one insecticide, 22 (73.3 percent) used two, two (6.7 percent) used three insecticides, and one producer (3.3 percent) reported using five insecticides. The mean number of insecticides used by producers in 1980 was two.

Most frequently used insecticides. Five producers (16.7 percent) said Sevin was the insecticide used most frequently. The other twenty-five producers (83.3 percent) said Lannate was used most frequently. A recommended insecticide was used by all producers (11).

Times sprayed for insects. Ten producers (33.2 percent) sprayed under 7 times for insects, 16 (53.4 percent) sprayed 7 to 8 times, while the other four producers (13.3 percent) sprayed 9 or more times. The mean times tomatoes were sprayed for insects was 6.9 in 1980.

Percent crop loss to insects. Twelve producers (40 percent) said under 2 percent of their tomato crop was lost to insects in 1980, ten (33.3 percent) lost from 2 to 3 percent, while the other eight producers (26.7 percent) reported losing from 4 to 10 percent of their tomato crop to insects in 1980. The mean percent of crop loss to insects was 2.5.

Harvesting and Marketing

Yield per acre in tons. Nine producers (30 percent) reported that their tomato crop yield was 4 tons per acre or less in 1980, 14 producers (46.6 percent) had a yield of 5 to 6 tons, while the other seven producers (23.3 percent) reported from 7 to 9 tons per acre. The mean yield in tons per acre was 5.2 in 1980.

Percent harvested green. Twenty-eight producers (93.3 percent) harvested 30 percent or less of their tomatoes while they were in the green stage, one producer harvested from 31 to 60 percent of his tomatoes green, while the remaining producer harvested over 60 percent of his tomatoes green. The mean percentage of tomatoes harvested green was 4.4 in 1980.

Percent harvested at breaker stage. Four producers (13.3 percent) harvested 60 percent or less of their tomatoes at the breaker stage, five (16.6 percent) 61 to 90 percent, and 21 producers (70 percent) harvested over 90 percent of their tomatoes at the breaker stage. The mean percentage of tomatoes harvested at the breaker stage was 88.5.

Percent harvested pink. Twenty-three producers (76.7 percent) did not harvest any tomatoes in the pink stage, four (13.3 percent) harvested 30 percent or less and the remaining three producers (10 percent) harvested from 31 to 50 percent of their tomatoes in the pink stage. The mean percentage of tomatoes harvested in the pink stage was 7.

Date of first sale. Eleven producers (36.6 percent) sold their first tomatoes between June 12th and June 22nd, nine (30 percent) between June 23rd and June 27th, and the remaining ten producers (33.4 percent) sold their first tomatoes between June 28th and June 30th. The mean date for the first sale of tomatoes was June 24th.

Tomatoes grown for early or late market. Twenty-nine producers (96.7 percent) grew tomatoes for the early market. No producer grew tomatoes specifically for a late market, but one producer (3.3 percent) grew tomatoes for both early and late markets.

How tomatoes graded. All 30 producers (100 percent) graded their tomatoes in farm sheds.

Tons of tomatoes sold. Nine producers (32.3 percent) sold 4 or less tons of tomatoes in 1980. Eight (28.7 percent) sold from 16 to 30 tons, seven (25 percent) sold from 31 to 45 tons, while the remaining six producers (14.3 percent) sold from 46 to 99 tons of tomatoes. The mean tons of tomatoes sold in 1980 was 26.

Major market outlet. Twenty-three producers (76.7 percent) used wholesale-retailers as their major market outlet. Two producers (6.7 percent) sold primarily to stores. The other five producers (16.7 percent) sold primarily to farmers' markets.

Container used to market tomatoes. Twenty-one producers (70 percent) marketed tomatoes in half-bushel baskets. The other nine producers (30 percent) marketed their tomatoes in 30-pound cardboard boxes.

Major source of marketing information. Seven producers (23.3 percent) said that their major source of marketing information was farmers' markets, six (20 percent) from other farmers, 16 producers (53.3 percent) from buyers and the remaining one producer got his marketing information from sources other than those mentioned.

Highest price received per pound. The highest price received for tomatoes sold in 1980 was between 29 and 43 cents per pound by 10 producers, 12 producers (41.3 percent) received from 44 to 50 cents, while the remaining eight producers (24 percent) received from 51 to 57 cents per pound. The mean highest price received per pound for tomatoes in 1980 was 46 cents.

Percent sold at highest price. Twenty-one producers (70 percent) sold 5 percent or less of his tomatoes at the highest price, while the other nine producers (30 percent) sold from 6 to 33 percent of their 1980 tomato crop at the highest price. The mean percentage sold at the highest price was 6.5.

Lowest price per pound. Ten producers (34.3 percent) said that the lowest price received for tomatoes in 1980 was 13 cents per pound or less. Nine producers (30.9 percent) received from 14 to 20 cents, and the lowest price received by the other eleven producers (34.5 percent) was from 21 to 25 cents per pound. The mean lowest price producers received for tomatoes in 1980 was 16.7 cents per pound.

Extension Contacts in Last Twelve Months

Primary source of tomato production information. Twenty-five producers (83.3 percent) reported the Extension Service as their major source of tomato information, while the other five producers (16.7 percent) reported some other source.

Extension meetings of all types. Nine producers (30 percent) attended no Extension meetings, six (20 percent) attended one meeting, four (13.3 percent) attended two meetings, seven (23.3 percent) attended four Extension meetings during the past 12 months. The other two producers (6.7 percent) attended five Extension meetings. The mean number of Extension meetings attended was 1.81.

Extension meetings on tomato production and marketing. Eight producers (26.7 percent) did not attend any Extension meetings on

tomato production and marketing, 21 producers (70 percent) attended one, and one producer (3.3 percent) attended two Extension meetings on tomato production and marketing over the past 12 months. The mean number of Extension meetings attended on tomato production and marketing was 0.8.

Visits made to Extension office. Ten producers (33.3 percent) made no visits to the Extension office, three producers (10 percent) made one visit, four (13.3 percent) made two visits, six (20 percent) made three visits, four (13.3 percent) made four visits, and two (6.7 percent) made five visits to the Extension office during the past 12 months. One producer made eight visits to the Extension office. The mean number of visits made to the Extension office was 2.1.

Telephone calls made to Extension office. Three producers (10 percent) did not make any phone calls to the Extension office. Five (16.7 percent) made one call, five others (16.7 percent) made two calls, two (6.7 percent) made three calls, one (3.3 percent) made four calls, eight producers (26.7 percent) made five calls, three (10 percent) made six calls, and two producers (6 percent) made eight calls to the Extension office. The mean number of phone calls made to the Extension office during the past 12 months was 3.6.

Farm visits received from Extension agents. Five producers (16.7 percent) did not receive any visits from Extension agents, seven (23.3 percent) received one visit, five (16.7 percent) received two visits, three (10 percent) received three visits, two (6.7 percent) received four visits, four (13.3 percent) received five visits and

three producers (10 percent) received six visits from Extension agents. One producer (3.3 percent) received ten visits from Extension agents. The mean number of farm visits tomato producers received from Extension agents over a 12-month period was 2.7.

II. RELATIONSHIP BETWEEN CHARACTERISTICS OF FARM OPERATION AND THE NUMBER OF CONTACTS TOMATO PRODUCERS HAD WITH EXTENSION AGENTS

This section presents data (Table II) regarding the relationship between the characteristics of farm operations and the number of contacts the farmer had with Extension agents. The purpose of the analysis was to determine what influence Extension contacts may have had upon the characteristics of the tomato operation.

Major Source of Farm Income and Extension Meetings Attended

Eighteen of the thirty tomato producers (60 percent) reported vegetable production as their major source of farm income (see Table II). These 18 producers attended an average of 1.72 Extension meetings. The other 12 producers' (40 percent) major source of farm income was row crops and they attended an average of 1.83 Extension meetings. When tested by the one-way analysis of variance F test it was found that the difference in the number of Extension contacts by sources of farm income was not significant at the .05 probability level. Therefore, the farmers' major source of farm income was not significantly influenced by the number of Extension meetings attended.

TABLE II

RELATIONSHIP BETWEEN SELECTED CHARACTERISTICS OF TOMATO PRODUCTION AND THE NUMBER OF CONTACTS TOMATO PRODUCERS HAD WITH EXTENSION AGENTS OVER A 12-MONTH TIME PERIOD

Characteristics of Tomato Production	Number of Producers	Mean Number of Extension Contacts				
		Extension Meetings	Tomato Meetings	Office Visits	Telephone Calls	Farm Visits
<u>Major source of farm income</u>						
Vegetable	18	1.72	0.78	2.22	3.83	3.17
Row crop	12	1.83	0.75	1.92	3.33	2.08
		F=.034	F=0.02	F=0.16	F=0.25	F=1.47
		p=.86	p=0.89	p=0.69	p=0.62	p=0.24
<u>Variety grown</u>						
Floradade	1	2.0	2.0	0.00	5.00	6.00
Supersonic	5	2.2	0.8	2.35	3.60	2.20
Jet Star	2	0.0	0.0	0.00	1.50	1.00
Other	22	1.8	0.77	2.03	3.77	2.87
		F=1.0	F=5.0	F=0.83	F=0.53	F=1.05
		p=0.43	p=0.007	p=0.49	p=0.67	p=0.38
<u>Plant sources</u>						
Purchased	3	1.3	0.67	0.67	0.00	0.00
Home grown	27	1.8	0.78	2.26	4.03	3.04
		F=0.24	F=0.13	F=1.71	F=7.95	F=4.81
		p=0.63	p=0.72	p=0.20	p=0.0087	p=0.04
<u>How plants grown</u>						
Container	27	1.81	0.78	1.96	3.48	2.70
Bareroot	3	1.33	0.67	3.33	5.00	3.00
		F=0.24	F=0.13	F=1.25	F=0.90	F=0.04
		p=0.63	p=0.72	p=0.27	p=0.35	p=0.84

TABLE II (continued)

Characteristics of Tomato Production	Number of Producers	Extension Meetings	Mean Number of Extension Contacts			
			Tomato Meetings	Office Visits	Telephone Calls	Farm Visits
<u>Fertilizer applied by soil test</u>						
No	20	1.3	0.65	1.50	2.90	1.80
Yes	10	2.7	1.00	3.30	5.10	4.60
		F=6.07	F=3.49	F=6.22	F=5.42	F=12.44
		p=0.02	p=0.07	p=0.02	p=0.03	p=0.002
<u>Fertilizer banded or broadcast</u>						
Banded	11	1.09	0.64	2.00	3.82	2.91
Broadcast	19	1.16	0.84	2.16	3.53	2.63
		F=3.4	F=1.17	F=0.04	F=0.08	F=0.089
		p=0.08	p=0.29	p=0.84	p=0.77	p=0.77
<u>Plant size when nitrogen applied</u>						
First fruit	28	1.9	0.82	2.25	3.85	2.89
None applied	2	0.0	0.00	0.00	0.50	0.50
		F=2.8	F=5.78	F=2.42	F=3.31	F=1.88
		p=0.10	p=0.02	p=0.13	p=0.08	p=0.18
<u>Lime applied by soil test</u>						
No	18	1.17	0.67	1.5	2.83	1.78
Yes	12	2.67	0.92	3.0	4.83	4.17
		F=8.0	F=1.82	F=4.43	F=4.73	F=8.93
		p=0.009	p=0.19	p=0.45	p=0.04	p=0.006

TABLE II (continued)

Characteristics of Tomato Production	Mean Number of Extension Contacts					
	Number of Producers	Extension Meetings	Tomato Meetings	Office Visits	Telephone Calls	Farm Visits
<u>Primary weed control method</u>						
Cultivation	24	1.88	0.75	2.29	3.96	3.04
Herbicides	4	0.76	0.75	0.50	2.50	1.00
Herbicides and cultivation	2	2.50	1.00	3.00	2.00	2.50
		F=1.09 p=0.35	F=0.22 p=0.80	F=1.62 p=0.21	F=0.94 p=0.40	F=1.25 p=0.30
<u>When fungicide first applied</u>						
Before planting	7	2.29	1.00	2.71	4.14	4.29
Soon after planting	21	1.76	0.76	2.09	3.76	2.48
Not used	2	0.00	0.00	0.00	0.00	0.00
		F=1.7 p=0.20	F=3.6 p=0.04	F=1.44 p=0.25	F=1.66 p=0.21	F=3.28 p=0.05
<u>Times fungicide applied</u>						
0	1	0.00	0.00	0.00	1.00	0.00
4	2	1.5	0.50	0.50	0.00	0.00
5	1	3.0	1.00	3.00	5.00	3.00
6	6	1.8	0.83	1.83	2.17	2.00
7	5	1.4	0.60	1.40	2.60	2.00
8	9	2.3	1.11	3.56	6.00	4.44
9	6	1.3	0.50	1.40	3.83	2.83
		F=0.57 p=0.75	F=1.9 p=0.12	F=1.57 p=0.20	F=4.20 p=0.005	F=1.82 p=0.14

TABLE II (continued)

Characteristics of Tomato Production	Percent of crop loss to disease		Times sprayed for insects		Mean Number of Extension Contacts	
	0	11	1	11	0	11
Number of Producers	11	11	1	11	Mean Number of Extension Contacts	0
Extension Meetings	2.18	2.18	4.00	4.00	Tomato Meetings	0.82
	1.00	1.00	0.00	0.00		1.00
	1.00	1.00	0.00	0.00		0.50
	1.30	0.67	1.00	1.00		0.67
	3.00	1.00	3.00	3.00		1.00
	0.70	0.67	0.00	0.00		0.67
	0.00	1.00	0.00	1.00		1.00
	0.00	0.00	0.00	0.00		0.00
	2.80	0.86	2.00	1.00		0.86
	F=0.81	F=0.41	F=0.74	F=1.5		F=0.41
	p=0.61	p=0.92	p=0.63	p=0.23		p=0.92
Office Visits	2.00	2.00	5.00	5.00	Office Visits	2.00
	2.00	2.00	0.00	0.00		2.00
	2.00	2.00	0.00	0.00		2.00
	4.00	4.00	1.17	1.17		4.00
	3.00	3.00	3.00	3.00		3.00
	1.00	1.00	1.40	1.40		1.00
	2.75	1.67	2.91	2.91		2.75
	F=0.54	F=0.54	F=1.21	F=1.21		F=0.54
	p=0.83	p=0.83	p=0.34	p=0.34		p=0.83
Telephone Calls	3.18	3.18	8.00	8.00	Telephone Calls	3.18
	5.00	5.00	0.00	0.00		5.00
	5.00	5.00	0.00	0.00		5.00
	5.00	5.00	1.50	1.50		5.00
	3.00	3.00	2.60	2.60		3.00
	3.33	3.33	5.45	5.45		3.33
	3.00	3.00	3.25	3.25		3.00
	2.00	2.00	F=3.94	F=3.94		2.00
	2.00	2.00	p=0.006	p=0.006		2.00
Farm Visits	3.18	3.18	5.00	5.00	Farm Visits	3.18
	2.00	2.00	0.00	0.00		2.00
	3.00	3.00	0.00	0.00		3.00
	3.33	3.33	1.17	1.17		3.33
	3.00	3.00	2.00	2.00		3.00
	1.00	1.00	4.09	4.09		1.00
	2.75	1.67	F=1.64	F=1.64		2.75
	3.00	3.00	p=0.18	p=0.18		3.00

TABLE II (continued)

Characteristics of Tomato Production	Mean Number of Extension Contacts					
	Number of Producers	Extension Meetings	Tomato Meetings	Office Visits	Telephone Calls	Farm Visits
<u>Percent crop loss to insects</u>						
0	9	2.00	0.67	1.67	3.22	1.89
1	3	2.00	0.67	1.00	2.00	1.33
2	7	0.71	0.43	2.43	4.29	3.43
3	3	1.33	1.00	1.00	3.00	1.67
5	6	2.67	1.00	3.17	4.00	3.33
10	2	2.00	1.50	3.00	5.50	6.00
		F=1.13	F=2.44	F=0.87	F=0.58	F=1.61
		p=0.37	p=0.06	p=0.52	p=0.71	p=0.20

Major Source of Farm Income and Production and Marketing Meetings Attended

The 18 producers whose major source of farm income was vegetables attended an average of 0.78 Extension tomato meetings. The other 12 producers, whose major source of farm income was row crops, attended an average of 0.75 tomato meetings. When tested by the F test it was found that the difference in the number of Extension tomato meetings attended by the major sources of farm income was not significant at the .05 level. Therefore, the number of tomato production and marketing meetings attended was not significantly related to the farmer's major source of farm income.

Major Source of Farm Income and Office Visits to Extension Office

The producers (18) whose major source of farm income was vegetables made an average of 2.22 visits to the Extension office compared to 1.92 visits by those whose major source of farm income was row crops. When tested by the F test, these differences in office visits were not significant at the .05 level. Therefore, the number of visits made to the Extension office was not significantly related to the producer's major source of farm income.

Major Source of Farm Income and Telephone Calls to Extension Office

The 18 producers (60 percent) whose major source of farm income was vegetables made an average of 3.83 phone calls to the Extension office compared to 3.33 phone calls by those whose major source of farm income was row crops. When tested by the F test the difference

in telephone calls was not significant at the .05 level. Therefore, the number of telephone calls made to the Extension office was not significantly related to the major source of farm income.

Major Source of Farm Income and Farm Visits
Received from Extension Agents

Eighteen of the producers (60 percent) reported receiving an average of 3.17 farm visits from Extension agents in a twelve-month period. Those producers whose major source of farm income was vegetables received an average of 3.17 farm visits from Extension agents compared to 2.08 farm visits received by those whose major source of farm income was row crops. When tested by the F test, these differences in the number of farm visits received by major sources of farm income were not significant. Therefore, the number of visits received from Extension agents was not significantly related to the major source of farm income.

Variety of Tomato Grown and Extension
Meetings Attended

The 22 producers (73.3 percent) who grew a variety other than Jet Star, Supersonic, or Floradade reported attending an average of 1.8 Extension meetings compared to 0.0, 2.0, and 2.2 Extension meetings attended by those who were growing Jet Star, Floradade, and Supersonic, respectively. When tested by the F test, the differences in the number of Extension meetings attended were not significant. Therefore, the number of Extension meetings attended by producers was not significantly related to the variety of tomatoes grown.

Variety of Tomato Grown and Meetings on Tomato Production and Marketing Attended

One producer, who grew the Floradade variety, reported attending two production and marketing meetings. Five other producers (16.6 percent) grew the Supersonic variety and attended an average of 0.8 meetings on production and marketing of tomatoes. The two producers (6.6 percent) who grew the Jet Star variety reported attending an average of 0.0 meetings on production and marketing of tomatoes. The 22 producers who grew a variety other than Jet Star, Supersonic, or Floradade attended an average of 0.77 tomato meetings compared to 0.0, 0.8, and 2.0 tomato meetings attended by those who were growing Jet Star, Supersonic, and Floradada, respectively. The differences were significant. Therefore, the number of tomato meetings attended by producers was significantly related to the variety of tomatoes grown. The producer who grew the Floradada variety attended significantly more tomato production and marketing meetings than producers who grew other varieties.

Variety of Tomato Grown and Office Visits Made

The number of visits made to the Extension office varied from zero to 2.35, depending upon the particular variety of tomatoes grown by the producers. Those who grew Jet Star did not make any visits to the Extension office compared to an average of 2.35 visits made by those who were growing the Supersonic variety. These differences in the number of visits producers made to the Extension office did not differ significantly by the variety of tomatoes grown.

Variety of Tomato Grown and Telephone Calls Made to the County Extension Office

The average number of telephone calls producers made to the Extension office over a 12-month period varied from 1.5 from those who were raising the Jet Star variety of tomatoes to 5.0 calls by those raising Floradade. The differences in the number of telephone calls made by the producers did not differ significantly by the variety of tomatoes grown.

Variety of Tomato Grown and Farm Visits Received from County Extension Agents

The producer who grew the Floradade variety received six farm visits from Extension agents. Five producers grew the Supersonic variety and received an average of 2.2 farm visits. Two other producers grew the Jet Star variety and received an average of one farm visit. The twenty-two other producers grew a variety other than those mentioned and received an average of 2.87 farm visits from Extension agents. These differences in the number of farm visits producers received from Extension agents by the variety of tomatoes grown were not significant at the .05 level. Therefore, the number of farm visits received from County Extension agents was not significantly related to the variety of tomatoes grown.

Plant Sources and Extension Meetings Attended

Three producers used purchased plants and attended an average of 1.3 Extension meetings. The other twenty-seven producers used home grown plants and attended an average of 1.8 Extension meetings. When

tested by the F test, these differences were not significant. Therefore, the number of Extension meetings attended was not significantly related as to whether plants were purchased or home grown.

Sources of Plants and Number of Tomato Production and Marketing Meetings Attended

The three producers who purchased their plants attended an average of 0.67 meetings on tomato production and marketing compared to an average of 0.78 meetings attended by the twenty-seven producers who grew their own plants. These differences were not significant. Therefore, the number of production and marketing meetings attended was not significantly related to whether plants were purchased or home grown.

Source of Plants and Farmer Visits to the Extension Office

Three producers purchased their plants and made an average of 0.67 visits to the Extension office while 27 producers grew their own plants and visited the Extension office an average of 2.26 times. When tested by the F test the differences were not significant. Therefore, the number of visits to the Extension office was not significantly related to whether plants were purchased or home grown.

Source of Plants and Telephone Calls Made to the Extension Office

The three producers who purchased their plants made no phone calls to the Extension office compared to an average of 4.03 calls by the other 27 producers who grew their own plants. These differences in the number of telephone calls producers made to the Extension

office by whether the producer purchased or grew his own tomato plants were significant. Therefore, the number of phone calls made to the Extension office was significantly related to whether farmers purchased or grew their own plants. Producers who grew their own plants made significantly more phone calls to the Extension office than those who purchased plants.

Sources of Plants and Farm Visits Received from Extension Agents

The three producers who purchased their plants reported receiving no farm visits from Extension agents compared to 3.04 farm visits received by the 27 producers who grew their own tomato plants. When tested by the F test, the differences were significant. Therefore, the number of farm visits received from County Extension agents was significantly related as to whether plants were purchased or home grown. Producers who grew their own plants received significantly more visits from Extension agents.

How Plants Grown and Extension Meetings Attended

The 27 producers who used plants grown in containers attended an average of 1.81 Extension meetings compared to 1.33 meetings attended by the three producers who used vareroot plants. The F test showed no significant difference. Therefore, the number of Extension meetings attended was not significantly related to whether plants were container or bareroot grown.

How Plants Were Grown and Production and Marketing Meetings Attended

The 27 producers who used container grown plants attended an average of 0.78 tomato meetings compared to 0.67 meetings attended by the three producers who used bareroot plants. These differences were not significant when tested by the F test. Therefore, the number of tomato production and marketing meetings attended was not significantly related to how plants were grown.

How Plants Were Grown and Office Visits Made

The 27 producers who used container grown plants made an average of 1.96 visits to the Extension office compared to 3.33 visits made by the other producers who grew bareroot plants. The differences were not significant. Therefore, the number of visits to the Extension office was not significantly related to how plants were grown.

How Plants Were Grown and Telephone Calls to the Extension Office

The 27 producers who used container grown plants made an average of 3.48 phone calls to the Extension office compared to 5.0 telephone calls made by the other three producers who used bareroot plants. When tested by the F test, the differences were not significant. Therefore, the number of telephone calls to the Extension office was not significantly related to how plants were grown.

How Plants Were Grown and Farm Visits Received from Extension Agents

The 27 producers who used container grown plants received an average of 2.7 farm visits from Extension agents compared to 3.0 farm

visits received by the other three producers who used bareroot plants. When tested by the one-way analysis of variance F test, there was no significant difference. Hence, the number of farm visits received was not significantly related to how plants were grown.

Fertilizer Applied by Soil Test and Extension Meetings Attended

The 20 producers who did not fertilize by soil test attended an average of 1.3 Extension meetings compared to 2.7 attended by the 10 other producers who did apply fertilizer by soil test. When tested by the F test, the differences were significant. Therefore, the number of Extension meetings attended significantly related to whether or not the producers applied fertilizer by soil test. Producers who fertilized by soil test recommendations attended significantly more Extension meetings.

Fertilizer Applied by Soil Test and Production and Marketing Meetings Attended

The 20 producers who did not apply fertilizer by soil test attended an average of 0.65 tomato meetings compared to 1.0 meetings by those who did apply fertilizer by soil test. When tested by the F test, the difference was not significant. Therefore, the number of production and marketing meetings was not significantly related to whether or not fertilizer was applied by soil test.

Fertilizer Applied by Soil Test and Visits to Extension Office

The 20 producers who did not soil test made an average of 1.5 visits to the Extension office compared to 3.3 visits by other

producers who fertilized by soil test. These differences were significant at the .05 level. Therefore, the number of visits to the Extension office significantly related to whether or not farmers applied fertilizer by soil test. Farmers who fertilized by soil test made significantly more visits to the Extension office.

Fertilizer Applied by Soil Test and Telephone Calls Made to the Extension Office

The 20 producers who did not apply fertilizer by soil test phoned the Extension office an average of 2.9 times compared to 5.1 calls by the other 10 producers who did fertilize by soil test. The differences were significant. Therefore, the number of phone calls made to the Extension office was significantly related to whether or not fertilizer was applied by soil test. Producers who fertilized by soil test made significantly more phone calls to the Extension office.

Fertilizer Applied by Soil Test and Farm Visits Received from Extension Agents

The 20 producers who did not apply fertilizer by soil test received an average of 1.8 farm visits from Extension agents compared to 4.6 farm visits received by the other 10 producers who did fertilize by soil test. When tested by the F test, the difference was significant. Therefore, the number of farm visits received from Extension agents was significantly related to whether or not producers fertilized by soil test. Producers who fertilized by soil test received significantly more visits from Extension agents.

Fertilizer Banded or Broadcast and Extension Meetings Attended

The 11 producers who fertilized by banding attended an average of 1.09 Extension meetings compared to 1.16 meetings attended by the other 19 producers who applied fertilizer broadcast. When tested by the F test, the difference was not significant. Therefore, the number of Extension meetings attended was not significantly related to whether producers fertilized banded or broadcast.

Fertilizer Banded or Broadcast and Production and Marketing Meetings Attended

The 11 producers who fertilized by banding attended an average of 0.64 production and marketing meetings compared to 0.84 meetings by the other 19 producers who broadcast their fertilizer. When tested by the F test, the difference was not significant. Consequently, the number of production and marketing meetings attended was not significantly related to whether fertilizer was applied banded or broadcast.

Fertilizer Banded or Broadcast and Visits to Extension Office

The 11 producers who fertilized banded made an average of 2.0 visits to the Extension office compared to 2.16 visits by the other 19 producers who broadcast fertilizer. When F tested, the difference was not significant. Thus, the number of visits to the Extension office was not significantly related as to whether producers banded or broadcast fertilizer.

Fertilizer Banded or Broadcast and Telephone Calls Made to the Extension Office

The 11 producers who banded made an average of 3.82 phone calls to the Extension office compared to 3.53 calls by the remaining 19 producers who broadcast fertilizer. The difference was not significant. Therefore, the number of phone calls made to the Extension office was not significantly related to whether producers banded or broadcast fertilizer.

Fertilizer Banded or Broadcast and Farm Visits Received from Extension Agents

The 11 producers who banded fertilizer received an average of 2.91 visits from Extension agents compared to 2.61 farm visits received by the 19 other producers who broadcast fertilizer. The difference was not significant. Hence, the number of farm visits received from Extension agents was not significantly related to whether fertilizer was applied banded or broadcast.

Plant Size When Nitrogen Applied and Extension Meetings Attended

The 28 producers who applied nitrogen at first fruit attended an average of 1.9 Extension meetings compared to 0.0 meetings attended by the remaining two producers who did not apply nitrogen sidedressed. When tested by the F test, the differences were not significant. Thus, the number of Extension meetings attended was not significantly related as to whether or not producers applied nitrogen sidedressed.

Plant Size When Nitrogen Applied and Production and Marketing Meetings Attended

The 28 producers who applied nitrogen at first fruit attended 0.82 meetings on tomato production and marketing compared to 0.0 meetings by the two producers who did not apply nitrogen. These differences were significant at the .05 level. Therefore, the number of tomato production and marketing meetings attended was significantly related as to whether producers applied nitrogen at first fruit or did not apply any nitrogen. Producers who applied nitrogen at first fruit attended significantly more production and marketing meetings.

Plant Size When Nitrogen Applied and Farmer Visits to the Extension Office

The 28 producers who applied nitrogen at first fruit made an average of 2.25 visits to the Extension office compared to 0.0 visits by the remaining producers who did not apply any nitrogen. When tested by the F test, the difference was not significant. Thus, the number of visits made to the Extension office was not significantly related as to whether nitrogen was applied at first fruit or not applied.

Plant Size When Nitrogen Applied and Telephone Calls Made to the Extension Office

The 28 producers who applied nitrogen at first fruit made an average of 3.85 phone calls to the Extension office compared to 0.50 calls made by the other producers who did not apply nitrogen side-dressed. The differences were not significant. Hence, the number of

phone calls made to the Extension office was not significantly related as to whether producers applied nitrogen sidedressed or did not apply nitrogen.

Plant Size When Nitrogen Applied and Farm Visits Received from Extension Agents

The 28 producers who applied nitrogen at first fruit received an average of 2.89 visits from Extension agents compared to 0.5 farm visits received by the two producers who did not apply nitrogen sidedressed. The differences were not significant. Therefore, whether or not producers applied nitrogen at first fruit was not significantly related to the number of farm visits received from Extension agents.

Lime Applied by Soil Test and Extension Meetings Attended

The 18 producers who did not lime by soil test attended an average of 1.17 Extension meetings compared to 2.67 attended by the other 12 producers who did apply lime by soil test. When tested by the F test, the difference was significant. Thus, whether or not producers applied lime by soil test was significantly related to how many Extension meetings were attended. Producers who limed by soil test attended significantly more Extension meetings.

Lime Applied by Soil Test and Production and Marketing Meetings Attended

The 18 producers who did not apply lime by soil test attended an average of 0.67 production and marketing meetings compared to 0.92 meetings attended by the remaining 12 producers who did not lime by soil test. The difference was not significant at the .05 level.

Consequently, whether or not producers applied lime by soil test was not significantly related to the number of production and marketing meetings attended.

Lime Applied by Soil Test and Farmer Visits
to the Extension Office

The 18 producers who did not lime by soil test made an average of 1.5 visits to the Extension office compared to 3.0 office visits by the other producers who did lime by soil test. The difference was significant at the .05 level. Thus, whether or not producers applied lime by soil test was significantly related to the number of visits producers made to the Extension office. Producers who limed by soil test made significantly more visits to the Extension office than the producers who did not lime by soil test.

Lime Applied by Soil Test and Telephone
Calls Made to the Extension Office

The 18 producers who did not apply lime by soil test phoned the Extension office an average of 2.83 times compared to 4.83 calls by the remaining producers who did not apply lime by soil test. The difference was significant. Therefore, whether or not lime was applied by soil test was significantly related to the number of phone calls made to the Extension office. Producers who limed by soil test made significantly more phone calls to the Extension office.

Lime Applied by Soil Test and Farm Visits
Received from Extension Agents

The 18 producers who did not apply lime by soil test received an average of 1.78 farm visits from Extension agents compared to 4.17

visits received by the other producers who limed by soil test. When tested by the F test, the differences were significant. Thus, whether or not producers limed by soil test was significantly related to the number of visits received from Extension agents. Producers who limed by soil test received significantly more farm visits from Extension agents.

Primary Weed Control Method and Extension Meetings Attended

The 24 producers who used cultivation as their primary source of weed control averaged attending 1.88 Extension meetings compared to 0.76 meetings attended by the producers who used herbicides as their major method of weed control. Producers who used both herbicides and cultivation averaged attending 2.5 Extension meetings. The differences were not significant. Hence, whether a producer used cultivation, herbicides or both as their primary weed control method was not significantly related to the number of Extension meetings attended.

Primary Weed Control Method and Production and Marketing Meetings Attended

The 24 producers who used cultivation as their major weed control method averaged attending 0.75 production and marketing meetings compared to 0.75 meetings attended by the four producers who used herbicides as their primary method of weed control. Producers who used both cultivation and herbicides averaged attending one tomato meeting. When tested by the F test, the differences were not

significant. Therefore, the method of weed control used was not significantly related to the number of production and marketing meetings attended.

Primary Weed Control Method and Farmer Visits to the Extension Office

The 24 producers who used cultivation as their major source of weed control averaged making 2.29 visits to the Extension office compared to 0.50 visits by producers who used herbicides. Producers who used both herbicides and cultivation made an average of 3.0 visits to the Extension office. These differences were not significant. Thus, the primary weed control used by producers were not significantly related to the number of visits made to the Extension office by producers.

Primary Weed Control Method and Telephone Calls Made to Extension Office

The 24 producers who used cultivation as their major source of weed control made an average of 3.96 calls to the Extension office compared to 2.5 calls made by the four producers who used herbicides. Producers who used both methods of weed control averaged making two calls. These differences were not significant. Hence, the method of weed control was not significantly related to the number of phone calls made to the Extension office.

Primary Weed Control Method and Farm Visits Received from Extension Agents

The 24 producers who used cultivation as their primary method of weed control received an average of 3.04 visits from Extension agents

compared to 1.0 farm visits received by producers who used herbicides. Producers who used herbicides and cultivation received an average of 2.50 farm visits. These differences were not significant. Therefore, which method used for weed control was not significantly related to the number of farm visits producers received from Extension agents.

When Fungicide First Applied and Number
of Extension Meetings Attended

The seven producers who applied a fungicide before planting averaged attending 2.29 Extension meetings compared to 1.76 meetings attended by producers who applied a fungicide soon after planting. Producers who did not apply a fungicide did not attend any Extension meetings. When tested by the F test, these differences were not significant. Thus, when a fungicide was first applied was not significantly related to the number of Extension meetings attended.

When Fungicide First Applied and Production
and Marketing Meetings Attended

The seven producers who applied fungicide before planting averaged attending 1.00 meetings on tomato production and marketing compared to 0.76 meetings by producers who applied a fungicide soon after planting. Producers who did not use a fungicide did not attend any meetings on production and marketing. The difference was significant. Therefore, when a fungicide was first applied was significantly related to the number of production and marketing meetings attended by producers. Producers who applied fungicide

before planting attended significantly more production and marketing meetings.

When Fungicide First Applied and Farmer
Visits to Extension Office

The seven producers who applied fungicide before planting averaged making 2.71 visits to the Extension office compared to 2.09 visits by producers who applied fungicide soon after planting. Producers who did not use a fungicide did not make any visits to the Extension office. When tested by the F test, these differences were not significant. Thus, when fungicides were first applied was not significantly related to the number of farmer visits to the Extension office.

When Fungicide First Applied and Telephone
Calls Made to Extension Office

The seven producers who applied a fungicide before planting averaged 4.14 phone calls to the Extension office compared to 3.76 calls by producers who applied fungicide soon after planting. Producers who did not apply fungicide did not make any calls to the Extension office. Differences were not significant. Thus, when fungicides were applied was not significantly related to the number of phone calls made to the Extension office.

When Fungicide First Applied and Farm Visits
Received from Extension Agents

The seven producers who applied a fungicide before planting received an average of 4.29 farm visits from Extension agents compared to 2.48 farm visits received by producers who applied a fungicide soon

after planting. Producers who did not use a fungicide did not receive any farm visits from Extension agents. These differences were significant. Consequently, when a fungicide was first applied was significantly related to the number of farm visits received from Extension agents. Producers who applied fungicides before planting received more farm visits from Extension agents.

Times Fungicide Applied and Extension Meetings Attended

One producer did not use a fungicide nor attend any Extension meetings. Producers who used a fungicide from four to nine times averaged attending 1.3 to a high of 3.0 Extension meetings. These differences were not significant. Thus, the number of Extension meetings attended were not significantly related to the number of times a fungicide was applied.

Times Fungicide Applied and Tomato Production and Marketing Meetings Attended

One producer did not apply a fungicide and reported attending no meetings on tomato production and marketing. Two other producers applied fungicide from four to nine times and attended an average of from 0.5 to 1.0 meetings on production and marketing of tomatoes. However, these observed differences were not significant at the .05 level. Hence, the number of meetings attended by producers on production and marketing of tomatoes was not significantly related to the number of times a fungicide was applied.

Times Fungicide Applied and Farmer Visits to the County Extension Office

One producer did not apply a fungicide nor visit the Extension office. Producers who applied a fungicide from four to nine times made an average of from 0.50 to 3.0 visits to the Extension office. The differences were not significant. Thus, the number of visits farmers made to the County Extension office was not significantly related to the number of times a fungicide was applied.

Times Fungicide Applied and Telephone Calls Made to the County Extension Office

The one producer who did not apply a fungicide made 1.00 call to the Extension office. Producers who used a fungicide four to nine times made from 0.0 to 5.0 telephone calls to the Extension office. When tested by the F test, these observed differences were significant. Therefore, the number of telephone calls made to the County Extension office by producers was significantly related to the number of times a fungicide was applied. Producers who used fungicide more often also made more phone calls to the Extension office.

Times Fungicide Applied and Farm Visits Received from County Extension Agents

The producers who did not apply a fungicide did not receive any visits from Extension agents. Producers who used a fungicide from four to nine times received an average of 0.0 to 4.0 visits from County Extension agents. These differences were not significant. Consequently, the number of farm visits received from County Extension agents was not significantly related to the number of times a fungicide was applied.

Percent of Crop Loss to Disease and
Extension Meetings Attended

The eleven producers who had no crop loss to disease averaged attending 2.18 Extension meetings. Producers who had between 2 and 25 percent loss attended an average of 0.0 to 3.0 Extension meetings. These observed differences were not significant. Thus, the number of Extension meetings attended by producers was not significantly related to the percent of the crop lost to disease.

Percent of Crop Loss to Disease and Tomato
Production and Marketing Meetings Attended

Producers who did not have any crop loss due to disease averaged attending 0.82 Extension tomato production and marketing meetings. Producers who had from 2 to 25 percent crop loss to disease attended 0.0 to 3.0 Extension tomato production and marketing meetings. These observed differences were not significant. Hence, the number of tomato production and marketing meetings attended by producers was not significantly related to the percent of crop loss to disease.

Percent of Crop Loss to Disease and
Farmers Visits to Extension Office

Producers who reported no crop loss to disease averaged making 2.00 visits to the Extension office. Producers who reported from 2 to 25 percent loss made from 0.0 to 4.0 visits to the Extension office over a 12-month period. These observed differences were not significant at the .05 probability level. Therefore, the number of visits to the County Extension office was not significantly related to the percent of crop loss to disease.

Percent of Crop Loss to Disease and Telephone
Calls to the County Extension Office

Producers reported no loss to disease and averaged phoning the Extension office 3.18 times. Producers who reported between 2 and 25 percent crop loss to disease made from 2.0 to 5.0 telephone calls to the Extension office. These observed differences were not significant at the .05 level. Hence, the percent of crop loss to disease was not significantly related to the number of times a producer telephoned the Extension office.

Percent of Crop Loss to Disease and Farm
Visits Received from Extension Agents

Eleven producers who reported having no crop loss to disease received an average of 3.18 farm visits from County Extension agents. Producers who reported between 2 and 25 percent crop loss to disease received from 1.0 to 3.33 farm visits from the Extension agent. These observed differences were not significant. Thus, the number of farm visits received from County Extension agents was not significantly related to the percent of crop loss to disease.

Times Sprayed Tomatoes for Insects and
Extension Meetings Attended

One producer who did not spray for insects attended 4.0 Extension meetings. Producers who sprayed two to nine times reported attending 0.0 to 4.0 Extension meetings. These observed differences were not significant. Therefore, the number of Extension meetings attended was not significantly related to the number of times insects were sprayed for by producers.

Times Sprayed Tomatoes for Insects and Tomato
Production and Marketing Meetings Attended

One producer did not spray for insects and attended 1.00 production and marketing meeting. Producers who sprayed between two and nine times attended between 0.0 and 1.0 Extension tomato production and marketing meetings. These observed differences were not significant. Thus, the number of meetings on tomato production and marketing attended was not significantly related to the number of times a producer sprayed for insects.

Times Sprayed Tomatoes for Insects and Farmer
Visits to the Extension Office

One producer did not spray for insects but made five visits to the Extension office. Producers who sprayed for insects two or more times made between 0.0 and 5.0 visits to the Extension office. These observed differences were not significant. Hence, the number of visits producers made to the County Extension office was not significantly related to the number of times insects were sprayed.

Times Sprayed Tomatoes for Insects and Telephone
Calls Made to Extension Office

One producer did not spray for insects made eight telephone calls to the Extension office. Producers who sprayed for insects two or more times made from 0.0 to 8.0 telephone calls to the Extension office. These differences were significant. Thus, the number of phone calls made to the Extension office by producers was significantly related to the number of times insects were sprayed. Farmers who sprayed insects more often also made more phone calls to the Extension office.

Times Sprayed Tomatoes for Insects and Farm
Visits Received from Extension Agents

One producer did not spray for insects and received five farm visits from County Extension agents. Producers who sprayed for insects two or more times reported receiving from 0.0 to 5.0 farm visits from Extension agents over a 12-month period. These differences were not significant. Therefore, the number of farm visits received from Extension agents was not significantly related to the number of times insects were sprayed.

Percent Crop Loss to Insects and
Extension Meetings Attended

Nine producers reported no crop loss to insects; they attended an average of 2.00 Extension meetings. Producers who reported up to 10 percent loss due to insects reported attending an average of between 0.71 and 2.56 Extension meetings. These observed differences were not found to be significant. Therefore, the number of Extension meetings attended was not significantly related to the percent of crop lost to insects.

Percent Crop Loss to Insects and Tomato
Production and Marketing Meetings Attended

Nine producers had no crop loss due to insects and averaged attending 0.67 Extension production and marketing meetings. Producers who had up to 10 percent crop loss reported attending an average of between 0.67 and 1.5 Extension tomato production and marketing meetings over a 12-month period. These differences were not significant. Thus,

the number of tomato production and marketing meetings attended was not significantly related to the percent of crop lost to insects.

Percent of Crop Loss to Insects and
Farmer Visits to Extension Office

Nine producers had no crop loss due to insects and made an average of 1.67 visits to the County Extension office. Producers who reported up to 10 percent crop loss averaged making from 1.0 to 3.17 visits to the Extension office over a 12-month period. These observed differences were not significant at the .05 level. Hence, the number of visits a producer made to the County Extension office was not significantly related to the percent of crop loss to insects.

Percent Crop Loss to Insects and Telephone Calls
Made to Extension Office

The nine producers who reported no crop loss to insects averaged making 3.22 phone calls to the Extension office. Producers who reported up to 10 percent crop loss to insects averaged making from 2.0 to 5.5 telephone calls to the Extension office over a 12-month time period. These observed differences were not significant. Therefore, the number of phone calls a producer made to the Extension office was not significantly related to the percent of crop lost to insects.

Percent Crop Loss to Insects and Farm Visits
Received from County Extension Agents

The nine producers who did not have any crop loss reported receiving an average of 1.89 farm visits from Extension agents. Producers who reported having up to 10 percent crop loss due to

insect damage averaged receiving from 1.67 to 6.0 farm visits from Extension agents. These observed differences were not significant. Therefore, the number of farm visits received from Extension agents was not significantly related to the percent of crop lost to insects.

III. RELATIONSHIP BETWEEN TOMATO ACRES PLANTED, CHARACTERISTICS OF PRODUCTION, AND PRODUCTION PRACTICES USED

This section presents information regarding the relationship between the acres of tomatoes planted, and the characteristics of production practices used by producers. The purpose of this analysis was to determine if there was a relationship between tomato acres planted and the use of selected production practices and production characteristics.

Variety Grown and Acres Planted

Table III shows that one producer (3.3 percent) planted predominantly the Floradade variety of tomato and planted 5 acres. Five producers (16.6 percent) planted predominantly the Supersonic variety and planted an average of 5.4 acres of tomatoes. Two other producers (6.6 percent) planted predominantly the Jet Star variety and averaged planting 3.5 acres of tomatoes. The majority, 22 producers (73.3 percent) planted a variety other than those listed and averaged planting 7.6 acres of tomatoes. These observed differences were not significant at the .05 probability level. Therefore, the number of acres planted was not significantly related to the variety of tomatoes grown.

TABLE III
RELATIONSHIP BETWEEN TOMATO ACRES PLANTED
AND PRODUCTION PRACTICES USED

Name of Variable	Number of Producers (N=30)	Mean Acres Planted		
<u>Variety grown</u>				
Floradade	1	5.0		
Supersonic	5	5.4		
Jet Star	2	3.5		
Other	22	7.6		
	F=0.22	p=0.88	df=3	
<u>Were plants purchased or home grown</u>				
Purchased	3	1.3		
Home grown	27	7.5		
	F=1.5	p=0.23	df=1	
<u>Were plants contained or bareroot</u>				
Container	27	7.1		
Bareroot	3	5.0		
	F=0.17	p=0.69	df=1	
<u>Major source of labor</u>				
Family	12	6.17		
Hired	18	7.39		
	F=0.15	p=0.70	df=1	
<u>Fertilizer applied by soil test</u>				
No	20	4.1		
Yes	10	12.5		
	F=8.7	p=0.006	df=1	
<u>Fertilizer banded or broadcast</u>				
Banded	11	4.8		
Broadcast	19	8.1		
	F=1.1	p=0.30	df=1	
<u>Lime applied by soil test</u>				
No	18	3.6		
Yes	12	11.8		
	F=8.7	p=0.006	df=1	
<u>How were weeds controlled</u>				
Cultivation	24	7.5		
Herbicides	4	4.3		
Herbicides and cultivation	2	4.5		
	F=0.35	p=0.71	df=2	

TABLE III (continued)

Name of Variable	Number of Producers (N=30)	Mean Acres Planted		
<u>Primary herbicide used</u>				
Treflan	8	7.5		
Sencor	2	6.5		
None used	20	6.7		
	F=0.03	p=0.97		df=2
<u>When herbicides applied</u>				
Before planting	6	7.3		
After planting	3	7.0		
None used	21	6.8		
	F=0.01	p=0.99		df=2
<u>Major disease problem</u>				
Early blight	18	5.3		
Blossom end rot	8	11.0		
Verticillium wilt	1	10.0		
Not any	3	4.3		
	F=1.01	p=0.40		df=3
<u>When first applied fungicide</u>				
Before planting	7	7.4		
Soon after planting	21	7.2		
Not used	2	1.5		
	F=0.44	p=0.65		df=2
<u>Primary fungicide used</u>				
Maneb	16	8.4		
Bravo	11	6.0		
Methyl bromide	3	2.0		
	F=0.85	p=0.44		df=2
<u>Mixed fungicide with insecticides</u>				
No	1	1.0		
Yes	29	7.0		
	F=0.51	p=0.48		df=1
<u>Most serious insect problem</u>				
Aphids	5	13.6		
Cutworms	2	2.5		
Fruit worms	23	5.8		
	F=2.3	p=0.12		df=2
<u>Most frequently used insecticide</u>				
Sevin	5	3.2		
Lannate	25	7.6		
	F=1.2	p=0.28		df=1

TABLE III (continued)

Name of Variable	Number of Producers (N=30)	Mean Acres Planted		
<u>Times sprayed for insects</u>				
0	1	8.0		
2	1	2.0		
4	1	1.0		
5	1	40.0		
6	6	3.0		
7	5	5.8		
8	11	5.8		
9	4	11.3		
	F=6.5	p=0.0003	df=1	
<u>Yield per acre in tons</u>				
2	3	1.7		
3	2	4.0		
4	4	3.5		
5	10	9.9		
6	4	4.0		
7	2	4.0		
8	4	13.0		
9	1	5.0		
	F=0.89	p=0.53	df=7	
<u>Type market</u>				
Early	29	7.1		
Late	0			
Both	1	1.0		
	F=0.51	p=0.48	df=1	
<u>Major market outlet</u>				
Wholesaler-retailer	23	6.5		
Stores	2	3.5		
Farmers' market	5	10.2		
	F=0.58	p=0.57	df=2	
<u>Major source of marketing information</u>				
Farmers' market	7	3.9		
Other farmers	6	7.3		
Buyer	16	8.4		
Other	1	2.0		
	F=0.6	p=0.63	df=3	
<u>Primary source of tomato information</u>				
Extension	25	8.0		
Other	5	1.4		
	F=2.8	p=0.10	df=1	

Source of Plants and Acres Planted

Three producers (10 percent) purchased their tomato plants and planted an average of 1.3 acres of tomatoes. The other producers grew their own plants and planted an average of 7.5 acres of tomatoes. The F test showed the differences were not significant at the .05 level. Thus, the number of acres planted was not significantly related to where producers obtained their tomato plants.

Container or Bareroot Plants Used and Acres Planted

The 27 producers (90 percent) who used container grown plants averaged planting 7.1 acres of tomatoes. Bareroot plants were used by 3 producers (10 percent) who planted an average of 5.0 acres. The differences were not significant. Hence, the number of acres planted was not significantly related to whether producers used container or bareroot plants.

Major Source of Labor and Acres Planted

The 12 producers (40 percent) who used family as their major source of labor averaged planting 6.17 acres of tomatoes. Hired help was the major source of labor for 18 (60 percent) producers who planted an average of 7.39 acres of tomatoes. The differences were not significant. Therefore, the number of acres planted was not significantly related to the major source of labor producers used.

Fertilizer Applied by Soil Test and Acres Planted

The 20 producers who did not apply fertilizer by soil test planted an average of 4.1 acres of tomatoes. The remaining 10

producers (33.3 percent) did apply fertilizer by soil test and averaged planting 12.5 acres of tomatoes. When tested by the F test, the differences were found to be significant at the .05 probability level. Therefore, the number of acres planted was significantly related to whether or not producers fertilized by soil test. Producers who fertilized by soil test planted significantly more acres than those who did not soil test.

Fertilizer Banded or Broadcast and Acres Planted

Eleven producers (36.6 percent) banded fertilizer and planted an average of 4.8 acres of tomatoes. The other 19 producers (63.3 percent) broadcast fertilizer and planted an average of 8.1 acres. The differences were not significant. Therefore, the acres of tomatoes planted was not significantly related to how producers applied fertilizer.

Lime Applied by Soil Test and Acres Planted

Eighteen producers (60 percent) reported not liming by soil test. They grew an average of 3.6 acres of tomatoes. The other 12 producers (40 percent) applied lime by soil test and grew an average of 11.8 acres of tomatoes. The differences were significant. Therefore, the number of acres planted was significantly related to whether or not lime was applied by soil test. Producers who limed by soil test planted significantly more acres of tomatoes than those who did not soil test for lime.

How Weeds Were Controlled and Acres Planted

Twenty-four producers (80 percent) used cultivation to control weeds. They planted an average of 7.5 acres of tomatoes. Four other producers (13.3 percent) controlled weeds with herbicides and grew an average of 4.3 acres. The remaining two producers (6.6 percent) used a combination of herbicides and cultivation for weed control and averaged planting 4.5 acres of tomatoes. The differences were not significant. Thus, the number of acres planted was not significantly related to the method of weed control.

Primary Herbicide Used and Acres Planted

Eight producers (26.6 percent) used Treflan as their primary herbicide and averaged planting 7.5 acres of tomatoes. Two other producers used Sencor and planted an average of 6.5 acres. Twenty producers (66.6 percent) had no primary herbicide and planted an average of 6.7 acres of tomatoes. The differences were not significant. Thus, the number of acres planted was not significantly related to which herbicide, if any, was used.

When Herbicides Were Applied and Acres Planted

The six producers (20 percent) who used herbicide before planting grew an average of 7.3 acres of tomatoes. Three producers (10 percent) who applied herbicides after planting tomatoes averaged planting 7 acres of tomatoes. Twenty-one producers (70 percent) who used no herbicides averaged planting 6.8 acres of tomatoes. These observed differences were not significant. Therefore, the number of acres planted was not significantly related to when herbicides were applied.

Major Disease Problems and Acres Planted

The 18 producers (60 percent) who reported Early Blight to be their major disease problem averaged planting 5.3 acres of tomatoes. Eight producers (26.6 percent) who said their major disease problem was Blossom End Rot averaged growing 11 acres of tomatoes. One producer who reported Verticillium wilt as the major disease planted 10 acres of tomatoes. The other three producers (10 percent) who reported no major disease problem averaged planting 4.3 acres of tomatoes. The differences were not significant. Hence, the number of acres planted was not significantly related to the producer's major disease problem.

When Fungicide First Applied and Acres Planted

The seven producers (23.3 percent) who first applied fungicide before planting averaged growing 7.4 acres of tomatoes. Twenty-one producers (70 percent) who first applied fungicide soon after planting averaged planting 7.2 acres of tomatoes. Two producers who did not use a fungicide planted an average of 1.5 acres of tomatoes. The differences were not significant. Thus, the acres producers planted was not significantly related to when fungicides were first applied.

Primary Fungicide Used and Acres Planted

The 16 producers (53.3 percent) who used Maneb as the primary fungicide grew an average of 8.4 acres of tomatoes. Eleven producers (36.6 percent) used Bravo as their primary fungicide and planted an average of 6 acres of tomatoes. The other three producers (10 percent) used Methyl Bromide as their primary fungicide and grew an average of

2 acres of tomatoes. The differences were not significant. Hence, the acres planted was not significantly related to the primary fungicide used.

Fungicide Mixed with Insecticides and Acres Planted

The producer (3.3 percent) who did not mix insecticides and fungicides planted 1 acre of tomatoes. The other 29 producers (96.6 percent) who did mix fungicides and insecticides averaged planting 7 acres of tomatoes. The differences were not significant. Therefore, the number of acres planted was not significantly related to whether fungicides and insecticides were mixed.

Most Serious Insect Problem and Acres Planted

Aphids were five producers (16.6 percent) most serious insect problem. They planted an average of 13.6 acres of tomatoes. The two producers who reported cutworms as their most serious insect problem planted an average of 2.5 acres of tomatoes. Fruitworms were reported by 23 producers (76.6 percent) to be the most serious insect problem. They averaged planting 5.8 acres of tomatoes. The differences were not significant at the .05 probability level. Thus, the number of acres planted was not significantly related to which insect was reported as the most serious problem.

Most Frequently Used Insecticide and Acres Planted

The five producers (16.6 percent) who used Sevin most frequently planted an average of 3.2 acres of tomatoes. Lannate was used most

frequently by 25 producers (83.3 percent) who planted an average of 7.6 acres of tomatoes. The differences were not significant. Therefore, the acres planted was not significantly related to which insecticide was used most frequently.

Times Sprayed for Insects and Acres Planted

One producer who did not spray for insects planted 8 acres of tomatoes. Another producer sprayed 2 times and planted 2 acres. The producer who sprayed for insects 4 times planted 1 acre of tomatoes. The producer who planted 40 acres of tomatoes sprayed 5 times for insects. Six producers (20 percent) who sprayed 6 times for insects grew 3 acres of tomatoes. Five producers (16.6 percent) sprayed 7 times for insects and grew an average of 5.8 acres. Eleven producers (36.6 percent) sprayed 8 times and planted an average of 5.8 acres of tomatoes. The other four producers (13.3 percent) sprayed 9 times and averaged planting 11.3 acres. The differences were significant. Thus, the number of acres planted was significantly related to the number of times the producers sprayed for insects. Producers who planted more acres sprayed significantly more times.

Yield Per Acre in Tons and Acres Planted

The range in tons of tomatoes sold per acre was from 2 to 9 while the average acres planted by these producers ranged from 1.7 to 13.0. The differences were not significant. Hence, the acreage planted was not significantly related to the yield in tons per acre.

Type Market and Acres Planted

The 29 producers (96.6 percent) who grew tomatoes for the early market planted an average of 7.1 acres of tomatoes. No producer grew tomatoes specifically for the late market. However, one producer grew tomatoes for both the early and late market. He planted 1 acre of tomatoes. The differences were not significant. Thus, the tomatoes acreage planted was not significantly related to the market tomatoes were grown for.

Major Market Outlet and Acres Planted

The 23 producers (76.6 percent) who reported their major market outlet to be both wholesale and retail planted an average of 6.5 acres of tomatoes. Producers who reported retail stores as their major market outlet planted an average of 3.5 acres. Producers who reported that farmers' markets were their major market outlet planted an average of 10.2 acres. The differences were not significant. Consequently, the acres planted was not significantly related to the farmer's major market outlet.

Major Source of Marketing Information and Acres Planted

The seven producers (23.3 percent) who said their major source of marketing information was farmers' markets averaged planting 3.9 acres of tomatoes. Six producers (20 percent) who used other farmers as their major source of marketing information planted an average of 7.3 acres. Sixteen producers (53.3 percent) who reported their major source of marketing information to be buyers planted an average of

8.4 acres. One producer who used a source other than those mentioned planted 2 acres of tomatoes. The differences were not significant. Therefore, the number of acres planted was not significantly related to the producer's major source of marketing information.

Primary Source of Tomato Information and Acres Planted

The 25 producers (83.3 percent) who reported using the Extension service as their primary source of tomato information planted an average of 8 acres of tomatoes. The other five producers (16.6 percent) who used a source other than Extension planted an average of 1.4 acres. These observed differences were not significant. Therefore, the number of acres planted was not significantly related to the producer's primary source of tomato information.

IV. RELATIONSHIP BETWEEN PRODUCTION CHARACTERISTICS, PRODUCTION PRACTICES USED, AND TONS SOLD PER ACRE

Section IV presents findings regarding the relationship between the tons of tomatoes sold per acre and the production practices used. Twenty-five production practices and/or production characteristics were analyzed and results summarized in this section.

Variety Grown and Tons Sold Per Acre

Table IV shows that the one producer (3.3 percent) who grew the Floradade variety sold 3 tons per acre. Five other producers (16.6 percent) grew the Supersonic variety and their average yield was 4.8 tons per acre. The two producers (6.6 percent) who grew the Jet Star variety averaged 4.5 tons per acre. The majority of

TABLE IV

RELATIONSHIP BETWEEN PRODUCTION CHARACTERISTICS, PRODUCTION PRACTICES USED, AND POUNDS SOLD PER ACRE

Name of Variable	Number of Producers (N=30)	Mean Yield in Tons Per Acre		
<u>Variety grown</u>				
Floradade	1	3.0		
Supersonic	5	4.8		
Jet Star	2	4.5		
Other	22	5.5		
	F=0.8	p=0.51		df=3.00
<u>Plants purchased or home grown</u>				
Purchased	3	5.3		
Home grown	27	5.2		
	F=0.009	p=0.92		df=1.00
<u>Plants container or bareroot</u>				
Container	27	5.6		
Bareroot	3	5.0		
	F=0.050	p=0.82		df=1.00
<u>Fertilizer banded or broadcast</u>				
Banded	11	5.4		
Broadcast	19	5.2		
	F=0.08	p=0.78		df=1.00
<u>Times nitrogen applied sidedressed</u>				
0	2	2.0		
1	12	5.6		
2	12	5.3		
3	4	5.5		
	F=2.5	p=0.08		df=3.00
<u>Plant size when nitrogen applied sidedressed</u>				
First fruit	28	5.5		
None applied	2	2.0		
	F=7.9	p=0.009		df=1.00
<u>Lime applied by soil test</u>				
No	18	4.8		
Yes	12	5.8		
	F=2.1	p=0.15		df=1.00
<u>Method used to control weeds</u>				
Cultivation	24	5.1		
Herbicides	4	5.3		
Cultivation and herbicides	2	6.5		
	F=0.48	p=0.62		df=2.00

TABLE IV (continued)

Name of Variable	Number of Producers (N=30)	Mean Yield in Tons Per Acre		
<u>Times cultivated</u>				
2	1	3.0		
3	5	6.2		
4	7	5.7		
5	8	4.9		
6	6	5.5		
8	2	3.0		
9	1	5.0		
	F=1.1	p=0.39		df=6.00
<u>Primary herbicide used</u>				
Treflan	8	4.8		
Sencor	2	6.5		
None used	20	5.3		
	F=0.7	p=0.49		df=2.00
<u>When herbicide applied</u>				
Before planting	6	4.5		
After planting	3	6.7		
None used	21	5.2		
	F=1.4	p=0.27		df=2.00
<u>Major disease problems</u>				
Early blight	18	5.0		
Blossom end rot	8	6.4		
Verticillium wilt	1	5.0		
Not any	3	4.0		
	F=2.0	p=0.14		df=3.00
<u>When fungicide first applied</u>				
Before planting	7	5.9		
Soon after planting	21	5.3		
Not used	2	2.0		
	F=4.2	p=0.03		df=2.00
<u>Times fungicide applied</u>				
0	1	2.0		
4	2	4.0		
5	1	8.0		
6	6	5.7		
7	5	6.2		
8	9	5.1		
9	6	4.7		
	F=1.5	p=0.21		df=6.00

TABLE IV (continued)

Name of Variable	Number of Producers (N=30)	Mean Yield in Tons Per Acre		
<u>Primary fungicide used</u>				
Maneb	16	5.5		
Bravo	11	5.4		
Methyl bromide	3	3.3		
	F=1.84		p=0.18	df=2.00
<u>Fungicide mixed with insecticide</u>				
No	1	2.00		
Yes	29	5.34		
	F=3.3		p=0.08	df=1.00
<u>Percent crop loss to disease</u>				
0	11	4.09		
2	1	5.0		
3	2	5.0		
5	3	4.0		
8	1	8.0		
10	3	7.0		
15	1	8.0		
18	1	6.0		
20	4	5.25		
25	3	7.0		
	F=2.5		p=0.04	df=9.00
<u>Most serious insect problem</u>				
Aphids	5	5.4		
Cutworms	2	3.0		
Fruitworms	23	5.39		
	F=1.60		p=0.22	df=2.00
<u>Number insecticides used</u>				
1	5	4.0		
2	22	5.2		
3	2	7.5		
5	1	8.0		
	F=2.9		p=0.05	df=3.00
<u>Most frequently used insecticide</u>				
Sevin	5	3.6		
Lannate	25	5.6		
	F=5.25		p=0.29	df=1.00

TABLE IV (continued)

Name of Variable	Number of Producers (N=30)	Mean Yield in Tons Per Acre		
<u>Times sprayed for insects</u>				
0	1	6.0		
2	1	2.0		
4	1	2.0		
5	1	8.0		
6	6	5.8		
7	5	6.2		
8	11	5.1		
9	4	4.3		
	F=2.06	p=0.09	df=7.00	
<u>Percent crop loss to insects</u>				
0	9	4.9		
1	3	6.7		
2	7	4.6		
3	3	6.0		
5	6	6.0		
10	2	3.5		
	F=1.3	p=0.29	df=5.00	
<u>Market tomatoes grown for</u>				
Early	29	5.3		
Late	0	0.0		
Both	1	2.0		
	F=3.3	p=0.08	df=1.00	
<u>Major source of marketing information</u>				
Farmers' market	7	5.4		
Other farmers	6	4.7		
Buyer	16	5.6		
Other	1	2.0		
	F=1.4	p=0.26	df=3.00	
<u>Primary source of tomato information</u>				
Extension	25	5.3		
Other	5	4.8		
	F=0.32	p=0.58	df=1.00	

producers (73.3 percent) grew a variety other than those mentioned and their average yield was 5.5 tons per acre. These differences were not significant at the .05 level. Therefore, the variety planted was not significantly related to the tons of tomatoes sold per acre.

Plants Purchased or Home Grown and Tons Sold Per Acre

The three producers (10 percent) who purchased plants had an average yield of 5.3 tons per acre. The majority of producers (90 percent) used home grown plants and they averaged 5.2 tons per acre. When tested by the F test, the differences were not significant at the .05 level. Thus, tons of tomatoes sold per acre was not significantly related to whether plants were purchased or home grown.

Plants Grown in Containers or Bareroot and Tons Sold Per Acre

The majority of producers (90 percent) used container grown plants and their average yield was 5.6 tons per acre. The other three producers (10 percent) used bareroot plants and averaged 5 tons per acre. The differences were not significant. Consequently, whether plants were grown in containers or were bareroot when planted was not significantly related to the yield in tons per acre.

Fertilizer Banded or Broadcast and Tons Sold Per Acre

The two producers who applied no nitrogen sidedressed had an average of 2 tons per acre. Twelve producers (40 percent) sidedressed nitrogen 1 time and their average yield was 5.6 tons of tomatoes per acre. Twelve other producers applied nitrogen sidedressed 2 times

and they averaged 5.3 tons per acre yield. Four producers (13.3 percent) applied sidedressed nitrogen 3 times. Their average yield was 5.5 tons per acre. When F tested, the differences were not significant. Thus, the number of times nitrogen was applied sidedressed was not significantly related to the tons sold per acre.

Times Nitrogen Applied Sidedressed and Tons Sold Per Acre

The two producers who applied no nitrogen sidedressed had an average of 2 tons per acre. The 12 producers (40 percent) who sidedressed nitrogen 1 time had an average yield of 5.6 tons of tomatoes per acre. Twelve other producers applied nitrogen sidedressed 2 times and they averaged 5.3 tons per acre. The four producers (13.3 percent) who applied nitrogen sidedressed 3 times had an average yield of 5.5 tons per acre. These differences in yield per acre were not significant. Thus, the number of times nitrogen was applied sidedressed was not significantly related to the tons of tomatoes sold per acre.

Plant Size When Nitrogen Applied and Tons Sold Per Acre

The majority (93.3 percent) of producers applied nitrogen sidedressed when plants bore first fruit. They averaged selling 5.5 tons per acre. The other two producers (6.6 percent) did not apply nitrogen sidedressed and their average yield was 2 tons per acre. The differences in yield were significant. Consequently, plant size when nitrogen was applied sidedressed was significantly related to tons sold per acre. Producers who applied nitrogen at

first fruit sold significantly more tomatoes per acre than those producers who did not apply nitrogen sidedressed.

Lime Applied by Soil Test and Tons Sold Per Acre

The 18 producers (60 percent) who did not lime by soil test averaged selling 4.8 tons per acre. The other 12 producers (40 percent) limed by soil test and averaged selling 5.8 tons per acre. These differences in yield were not significant at the .05 level. Hence, whether or not lime was applied by soil test was not significantly related to tons sold per acre.

Methods Used to Control Weeds and Tons Sold Per Acre

The 24 producers (80 percent) who controlled weeds by cultivation averaged selling 5.1 tons of tomatoes per acre. Four more producers (13.3 percent) controlled weeds with herbicides and averaged selling 5.3 tons per acre. The other two producers (6.6 percent) used both cultivation and herbicides to control weeds. They averaged selling 6.5 tons per acre. These differences in yield were not significant at the .05 level. Therefore, the method used to control weeds was not significantly related to tons sold per acre.

Times Cultivated and Tons Sold Per Acre

One producer cultivated 2 times and sold 3 tons per acre. Five producers (16.6 percent) cultivated tomatoes 3 times and sold an average of 6.2 tons per acre. Seven additional producers (23.3 percent) cultivated 4 times and sold an average of 5.7 tons per acre.

Eight producers (26.6 percent) cultivated their tomatoes 5 times. Their average yield was 4.9 tons. Six of the producers (20 percent) cultivated 6 times and their average yield was 5.5 tons. Two producers (6.6 percent) cultivated 8 times and sold an average of 3 tons of tomatoes. One producer reported cultivating 9 times and sold 5 tons per acre. These differences in yield were not significant at the .05 level. Hence, the number of times cultivated was not significantly related to the number of tons sold per acre.

Primary Herbicide Used and Tons Sold Per Acre

Eight of the producers (26.6 percent) used Treflan as their primary herbicide. They averaged selling 4.8 tons of tomatoes per acre. Sencor was the primary herbicide used by two producers and they averaged selling 6.5 tons per acre. The majority (66.6 percent) of producers did not use a herbicide and they sold 5.3 tons per acre. The differences in yield were not significant. Therefore, the primary herbicide producers used was not significantly related to tons sold per acre.

When Herbicides Were Applied and Tons Sold Per Acre

Herbicides were applied before planting by six producers. These producers sold an average of 4.5 tons of tomatoes per acre. Three producers applied herbicides after planting and averaged 6.7 tons per acre. The producers (70 percent) who reported not using herbicides sold an average of 5.2 tons of tomatoes per acre. These differences

in yield were not significant at the .05 level. Thus, when herbicides were applied was not significantly related to the tons sold per acre.

Major Disease Problems and Tons Sold Per Acre

Early blight was the major disease problem reported by 18 producers (60 percent) who sold an average of 5 tons per acre. The eight producers (26.6 percent) who said blossom end rot was their major disease problem sold an average of 6.4 tons per acre. One producer who said verticillium wilt was his major disease problem sold 5 tons per acre. Three producers (10 percent) had no major disease problems and they sold an average of 4 tons per acre. These differences in yield were not significant at the .05 level. Consequently, producers' major disease problems were not significantly related to the tons sold per acre.

When Fungicide First Applied and Tons Sold Per Acre

The seven producers (23.3 percent) who applied the first fungicide on their tomatoes before planting had an average yield of 5.9 tons per acre. Fungicides were first applied by 21 producers (70 percent) soon after planting. Their average yield per acre was 5.3 tons. Two producers did not use a fungicide and they sold an average of 2 tons per acre. These differences in yield were significant. Therefore, when a fungicide was first applied was significantly related to the tons sold per acre. Producers who applied a fungicide before planting or soon after planting made significantly higher yield than producers who did not use fungicides at these times.

Times Fungicide Applied and Tons Sold Per Acre

One producer did not apply a fungicide. He sold 2 tons of tomatoes per acre. Two producers applied a fungicide 4 times and averaged selling 4 tons per acre. One other producer applied a fungicide 5 times and reported selling 8 tons per acre. Six producers (20 percent) applied fungicide 6 times and they sold an average of 5.7 tons per acre. Five other producers (16.6 percent) applied fungicide 7 times and sold an average of 6.2 tons of tomatoes per acre. Thirty percent of the producers (16.6 percent) applied fungicide 8 times. Their yield per acre was 5.1 tons. The other six producers (20 percent) applied fungicide 9 times and averaged selling 4.7 tons per acre. These differences in yield were not significant at the .05 level. Thus, the number of times fungicides were applied was not significantly related to the tons sold per acre.

Primary Fungicide Used and Tons Sold Per Acre

Maneb was the primary fungicide used by 53.3 percent of the producers. Their average yield was 5.5 tons per acre. Eleven producers (36.6 percent) used Bravo as their primary tomato fungicide. They sold an average of 5.4 tons per acre. Methyl bromide was the primary fungicide used by 10 percent of the producers and they sold an average of 3.3 tons per acre. These differences in yield were not significant. Consequently, the primary fungicide used was not significantly related to the tons sold per acre.

Fungicide Mixed With Insecticide
and Tons Sold Per Acre

One producer sold an average of 2 tons per acre and did not mix fungicide and insecticide. The other producers (96.6 percent) mixed fungicides and insecticides and averaged selling 5.34 tons of tomatoes per acre. These differences in yield were not significant at the .05 level. Hence, whether or not fungicides were mixed with insecticides was not significantly related to tons sold per acre.

Percent Crop Loss to Disease
and Tons Sold Per Acre

Eleven producers (36.6 percent) had no crop loss to disease and averaged selling 4.09 tons of tomatoes per acre. One producer had a 2 percent crop loss and sold 5 tons per acre. Two more producers reported a 3 percent crop loss to disease. They also averaged selling 5 tons per acre. Three of the producers lost 5 percent of their crop to disease and sold an average of 4 tons per acre. Another producer lost 8 percent of his crop to disease. He averaged selling 8 tons per acre. Three more producers lost 10 percent of their crop to disease, but sold an average of 7 tons of tomatoes per acre. One other producer had a 15 percent crop loss to disease and sold an average of 8 tons per acre. One more producer lost 18 percent of his crop to disease. He sold 6 tons per acre. A 20 percent crop loss was reported by four producers who averaged selling 5.25 tons per acre. A 25 percent crop loss to disease was reported by three producers who also sold an average of 7 tons per acre. These differences in yield were significant. Therefore, percent crop loss to disease

was significantly related to the tons sold per acre. Producers who lost a greater percentage to disease also had yields that were more than producers who had less loss to disease.

Most Serious Insect Problem and Tons Sold Per Acre

Aphids were the most serious insect problem reported by five producers. They sold an average of 5.4 tons of tomatoes per acre. Two producers (6.6 percent) said cutworms were their most serious insect problem. An average yield of 3 tons per acre was sold by these producers. The majority of the producers (76.6 percent) said fruitworms were their most serious insect problem. These producers averaged selling 5.39 tons of tomatoes per acre. These differences in yield were not significant. Thus, the producer's most serious insect problem was not significantly related to the tons sold per acre.

Number of Insecticides Used and Tons Sold Per Acre

Only one insecticide was used by 16.6 percent of the producers. Their average yield was 4 tons per acre. Twenty-two producers (73.3 percent) used 2 insecticides and sold an average of 5.2 tons of tomatoes per acre. Three insecticides were used by 6.6 percent of the producers. They sold an average of 7.5 tons per acre. These differences in tons sold per acre were significant at the .05 level. Therefore, the number of insecticides used was significantly related to tons sold per acre. Producers who used more than one insecticide had greater yields per acre.

Most Frequently Used Insecticides
and Tons Sold Per Acre

Sevin was used most frequently by 16.6 percent of the producers. They averaged selling 3.6 tons of tomatoes per acre. The majority of producers (83.3 percent) used Lannate most frequently to control insects. These producers averaged selling 5.6 tons of tomatoes per acre. These differences in yield per acre were not significant. Thus, the insecticide used most frequently was not significantly related to the tons sold per acre.

Number of Times Tomatoes Sprayed for
Insects and Tons Sold Per Acre

One producer (3.3 percent) did not spray for insects. He averaged selling 6 tons of tomatoes per acre. The producers who sprayed for insects twice sold 2 tons per acre. Another producer sprayed for insects 4 times and sold 2 tons per acre. One other producer sprayed 5 times and sold 8 tons per acre. Six producers (20 percent) sprayed for insects 6 times and averaged selling 5.8 tons of tomatoes per acre. Five more producers (16.6 percent) sprayed for insects 7 times and sold an average of 6.2 tons per acre. Thirty-seven percent of the producers sprayed for insects 8 times and sold an average of 5.1 tons per acre. The other four producers (13.3 percent) sprayed for insects 9 times and sold an average of 4.3 tons per acre. These differences in yield were not significant at the .05 level. Consequently, the number of times producers sprayed for insects was not significantly related to tons sold per acre.

Percent Crop Loss to Insects and Tons Sold Per Acre

No crop loss to insects was reported by nine producers (30 percent) who sold an average of 4.9 tons of tomatoes per acre. Three producers (10 percent) reported 1 percent crop loss and sold an average of 6.7 tons per acre. Seven other producers (23.3 percent) lost 2 percent of their crop to insects and sold an average of 4.6 tons per acre. Three producers (10 percent) lost 3 percent of the crop to insects and sold an average of 6 tons per acre. Twenty percent of the producers lost 5 percent of their crop to insects and they also sold 6 tons per acre. Insects were responsible for a 10 percent crop loss to two producers who sold an average of 3.5 tons of tomatoes per acre. As tested by the F test, these differences in yield per acre were not significant. Thus, the percent crop loss to insects was not significantly related to the tons of tomatoes sold per acre.

Types of Market Used and Tons of Tomatoes Sold Per Acre

Most of the producers (96.6 percent) grew tomatoes for the early market. Their average yield was 5.3 tons per acre. No producers grew tomatoes specifically for a late market. However, one producer (3.3 percent) grew tomatoes for both early and late market. His average yield was 2 tons per acre. As tested by the F test, these differences were not significant. Therefore, the market used was not significantly related to tons sold per acre.

Major Source of Marketing Information
and Tons Sold Per Acre

Farmers' markets was the major source of marketing information reported by seven producers. These farmers sold an average of 5.4 tons of tomatoes per acre. Six producers said they got their marketing information from other farmers. They sold an average of 4.7 tons per acre. The majority of farmers (53.3 percent) reported getting their marketing information from buyers. These producers sold an average of 5.6 tons per acre. The F test showed no significant difference in tons of tomatoes sold per acre. Consequently, the farmer's major source of marketing information was not significantly related to tons of tomatoes sold per acre.

Primary Source of Tomato Information
and Tons Sold Per Acre

The Extension Service was reported as the primary source of tomato information by 25 of the producers. Their average yield was 5.3 tons per acre. A source other than Extension was given by five producers (16.6 percent). These producers sold an average of 4.8 tons per acre. These differences in yield per acre was not significant at the .05 probability level. Therefore, the primary source of tomato information was not significantly related to the tons of tomatoes sold per acre.

CHAPTER III

SUMMARY OF MAJOR FINDINGS

I. PURPOSE AND SPECIFIC OBJECTIVES

Purpose

The purpose of the study was to characterize tomato producers as to their type and size of operation, use of recommended tomato practices, number of Extension contacts, acres planted, yields per acre, and the relationship between these variables.

Specific Objectives

1. To characterize the tomato producer as to the number and percent that used selected recommended tomato production practices.
2. To determine the relationship between producers use of selected practices and the number of contacts they had with Extension in a twelve-month period.
3. To determine the relationship between number of acres planted and use of selected practices.
4. To determine the relationship between the per acre yields sold and use of selected practices.

II. METHODS AND PROCEDURES

This section describes the methods and procedures used to obtain and analyze survey data used in this study.

Population and Sample

The population in this study was all tomato producers in Lauderdale County, Tennessee, who produced at least one-half acre of field tomatoes for sale in 1980. The Nth number technique was used to randomly select individuals to be included in this study. Data were obtained from 30 or about 65 percent of all the tomato producers in this county.

Survey Instrument

The basic interview schedule used to record data from each producer was developed by Extension Specialists in the Plant and Soil Sciences Section at The University of Tennessee. This research added some questions not included in the basic instrument. The instrument was designed for use in personal interviews. Questions dealt primarily with characteristics of the producers and their farm operation, their use of production and marketing practices and the number of contacts of various kinds the producers had with Extension agents. Also, data were obtained regarding the size of their tomato operation as well as pounds of tomatoes sold per acre of tomatoes grown.

Interviews

Interviews were conducted by this researcher during the Fall of 1980 and Spring of 1981.

Analysis of Data

Completed survey forms were mailed to the Agricultural Extension Education Section at The University of Tennessee where data cards were

punched and processed for computer analysis. Data were analyzed using computing equipment at The University of Tennessee, Knoxville. Descriptive statistics were used to summarize the survey data. Statistical tests used to determine the strength of relationships between variables as well as the significance levels included the one-way analysis of variance. The .05 probability level was used to make decisions regarding the significance of observed relationships between variables.

III. MAJOR FINDINGS

Characteristics of Tomato Producers and Their Farm Operations

1. The average acreage farmed by the producers was 255 acres. The majority of the producers relied on vegetables as their major source of farm income (i.e., 60 percent vegetables vs. 40 percent row crop). The average acreage planted was 6.9 acres. Most of the producers grew tomatoes on their own land (i.e., 28 vs. 1), and only four producers shared acreage. Twenty-two (73.3 percent) of the 30 producers grew a variety of tomato other than Floradade, Supersonic, and Jet Star. Ninety percent of the producers grew their own plants from seed. The other 10 percent purchased their plants. Ninety percent of the producers also grew their plants in individual containers. The majority of producers hired labor to help grow their tomatoes (i.e., 60 percent vs. 40 percent). Forty percent grew tomatoes with family labor.

2. The producers used an average of 787 pounds of fertilizer per acre on the tomatoes. Sixty-six percent of the producers did not

fertilize by soil test recommendations. Sixty-three percent of the producers broadcast their fertilizer as opposed to the 37 percent who banded fertilizer under or beside the row. The producers applied an average of 114 pounds of nitrogen, 105 pounds of phosphate, and 115 pounds of potash at planting. Nitrogen was then sidedressed an additional 1.6 times at a 48 pound per acre rate. The majority of the producers (93 percent) sidedressed when their plants began fruiting. Only 40 percent limed by soil test; the other 60 percent did not.

3. Eighty percent of the producers cited morningglory as their major weed problem. Cocklebur, purslane and spiny amaranth were the major weed problems for the other 20 percent of the producers. The major grass problems were johnsongrass (1 producer), crabgrass (12 producers), and the majority (56.7 percent) of the producers has goosegrass as their major grass problem. Eighty percent of the producers used cultivation to control weeds. Thirteen percent used herbicides for weed control and 7 percent used a combination of the two. Producers cultivated an average of 4.9 times during the growing season. Treflan was the primary herbicide used by the producers who used a herbicide. Two producers used Sencor but the majority (67 percent) of the producers did not use either herbicide. Of the nine producers who used herbicides 6 applied their herbicides before planting tomatoes; the other 3 applied herbicides after planting. Ninety percent of the producers had no crop loss due to weeds. However, 2 producers lost 5 percent and one lost 10 percent of his crop because of weeds. The average crop loss to weeds was 0.67 percent.

Early blight was 60 percent of the producers' major disease problem. Other significant diseases were blossom end rot and verticillium wilt. The majority (70 percent) of the producers first applied fungicide soon after planting. Twenty-three percent of the producers, however, used a fungicide before planting. Producers averaged applying fungicides 7 times. Maneb and Bravo were the primary fungicides used. Sixteen producers used Maneb and 11 used Bravo. The other 3 producers used methyl bromide. The majority of the producers (53 percent) used drop nozzle sprayers to apply fungicides. Twenty percent used air-blast sprayers and one producer used a knapsack sprayer. The primary pump used in applying fungicides was the roller pump. Eighteen producers (60 percent) used cone tip nozzles for spraying. With the exception of one producer, all of them mixed fungicides and insecticides when they sprayed. The average crop loss due to disease was 8.3 percent. Fruitworms were considered to be the most serious insect problem by 77 percent of the producers. The average number of insecticides used was 2, with 5 being used by one producer and 1 being used by five producers. The majority (73 percent) used 2 insecticides. Lannate was most frequently used by the majority of the producers. Insects were sprayed an average of 6.9 times. Only 2.5 percent crop loss was reported being due to insects.

4. The tomato producers harvested an average of 5.2 tons of tomatoes per acre. The majority (88.5 percent) of tomatoes were harvested at the breaker stage of maturity. The average date for first sale of tomatoes in 1980 was June 24. Most producers, 29 or 30, grew tomatoes for the early market. The producers graded their own

tomatoes in farm facilities and the majority, 23 of 30, used wholesalers-retailers as their major market outlet. The average tons sold per producer was 26. The mean highest price received was 46 cents per pound. The mean lowest price received was 16.7 cents per pound. Only 6.5 percent of tomatoes sold were sold at the highest price.

5. Eighty-three percent of the producers surveyed reported using the Extension Service as their major source of tomato information. These same producers averaged attending 1.81 Extension meetings of all types in 1980. However, nine producers attended no Extension meetings. The other 21 producers attended between 1 and 5 meetings. Eight producers did not attend any Extension meetings on tomato production and marketing. The other 22 producers attended 1 or 2 meetings. Seventy percent, or 21 of 30, attended one production and marketing meeting in 1980. Ten producers did not visit the Extension office in 1980. The other 20 producers visited the Extension office from 1 to 8 times. The mean number of visits was 2.1. Three producers made no phone calls to the Extension office in 1980. The other 27 producers surveyed made between 1 and 8 calls to the Extension office. The mean number of calls was 3.6. Five producers, 16.7 percent, reported receiving no farm visits from Extension agents. The mean farm visits received from Extension agents was 2.7.

Relationship Between Characteristics of Farm Operation and Number of Contacts Tomato Producers Had with Extension Agents

Sixty percent of the producers surveyed were dependent on vegetables for their major source of farm income. They attended

1.72 Extension meetings, 0.78 Extension meetings on production and marketing of tomatoes, made an average of 2.22 visits to the Extension office, telephoned the Extension office an average of 3.83 times, and received an average of 3.17 farm visits from Extension agents. The other 40 percent of the producers surveyed depended on row crops for their major source of farm income. They attended an average of 1.83 Extension meetings, 0.75 Extension meetings on production and marketing of tomatoes, made an average of 1.92 visits to the Extension office, 3.33 phone calls to the Extension office, and received an average of 2.08 farm visits from Extension agents. The contacts producers had with Extension was not significantly related to producers' major source of farm income.

Only 73 percent of the producers grew a variety of tomato other than Jet Star, Supersonic, and Floradade. These producers attended an average of 1.8 Extension meetings, and 0.77 Extension meetings on production and marketing. They also averaged making 2.03 visits and 3.77 telephone calls to the Extension office. These 22 producers received an average of 2.87 farm visits from Extension agents. The relationship between variety of tomato grown and contacts with Extension was not significant with the exception of tomato meetings attended. The one producer who grew the Floradade variety attended significantly more tomato meetings than did those producers who grew the Jet Star, Supersonic, and other varieties.

Over 90 percent of the producers grew their own plants. These producers averaged attending 1.8 Extension meetings, 0.78 production

and marketing meetings and made an average of 2.26 visits to the Extension office. They also phoned the Extension office an average of 4.03 times and received an average of 3.04 farm visits from Extension agents. The number of phone calls farmers made to the Extension office and the number of visits they received from Extension agents was significantly related to whether plants were purchased or home grown. Producers who grew their own plants made significantly more telephone calls and received more visits from Extension agents.

Over 90 percent of the producers used plants grown in containers. The other 10 percent used bareroot plants. The producers who used container grown plants attended an average of 1.81 Extension meetings, 0.78 tomato production and marketing meetings, and made an average of 1.96 visits to the Extension office. They also phoned the Extension office an average of 3.48 times and received an average of 2.7 farm visits from Extension agents. The number of contacts producers had with Extension was not significantly related to whether producers used bareroot or container grown plants.

Over 66 percent of the producers did not fertilize by soil test recommendations. The producers who did fertilize by soil test attended significantly more Extension meetings (2.7 vs. 1.3), made significantly more visits and phone calls to the Extension office, and received significantly more farm visits from Extension agents.

Producers applied fertilizer by banding and broadcasting. The producers who banded fertilizer attended an average of 1.09 Extension

meetings, 0.64 production and marketing meetings, and made an average of 2 visits and 3.82 phone calls to the Extension office. Those who broadcast fertilizer attended an average of 1.16 Extension meetings, 0.84 production and marketing meetings, and made an average of 2.16 visits and 3.53 calls to the Extension office. The farmers who banded and those who broadcast fertilizer received, respectively, 2.91 and 2.61 farm visits from Extension agents. There was not a significant relationship between how fertilizer was applied and Extension contacts.

Over 93 percent of the tomato producers applied nitrogen when plants began to have first fruit. These producers averaged attending 1.9 Extension meetings, 0.82 tomato production and marketing meetings, made an average of 2.25 visits and 3.85 phone calls to the Extension office and received an average of 2.89 visits from Extension agents. Plant size when nitrogen was applied and contacts with Extension were not significantly related, with one exception being that of tomato production and marketing meetings attended. Seven producers who applied nitrogen at first fruit attended significantly more production and marketing meetings than did producers who did not apply nitrogen.

Sixty percent of the farmers did not apply lime by soil test. The producers who did lime by soil test attended significantly more Extension meetings (2.6 vs. 1.17), made significantly more phone calls (4.83 vs. 2.83) to the Extension office, and received significantly more farm visits (4.17 vs. 1.78) from Extension agents.

Eighty percent of the farmers used cultivation as their primary weed control method. Over 13 percent used herbicides and 6.6 percent used a combination of cultivation and herbicides for weed control. The producers who used cultivation for weed control averaged attending 1.88 Extension meetings, 0.75 meetings on production and marketing tomatoes, made an average of 2.29 visits and 3.96 phone calls to the Extension office. They also received an average of 3.04 farm visits from Extension agents. The number of contacts farmers had with the Extension service was not significantly related to their primary weed control method.

Seven producers first applied a fungicide before planting, 21 producers soon after planting, and 2 did not use a fungicide at either of these times. The seven producers who applied fungicides before planting attended an average of 2.29 Extension meetings, 1 production and marketing meeting, made an average of 2.71 visits to the Extension office, phoned the Extension office an average of 4.14 times, and received an average of 4.29 farm visits from Extension agents. Extension contacts and when fungicides were first applied was significantly related in that producers who applied fungicides before planting attended significantly more production and marketing meetings and received significantly more farm visits from Extension agents.

The number of times a fungicide was applied was not significantly related with one exception, that being telephone calls made by farmers to the Extension office. Producers who used fungicides more often also made more phone calls to the Extension office.

Crop loss to disease ranged from 11 producers who had no crop loss to three producers who had a 25 percent crop loss. The number of contacts producers had with Extension was not significantly related to crop loss.

The number of times tomatoes were sprayed for insects ranged from one producer who did not spray for insects to four producers who sprayed nine times. Only the number of phone calls made to the Extension office was significantly related to the number of times tomatoes were sprayed for insects. Farmers who sprayed more often also made more phone calls to the Extension office.

Percent crop loss to insects ranged from nine producers having no crop loss to two producers having a 10 percent loss. The number of contacts farmers had with Extension through meetings, phone calls, and visits was not significantly related to the percent of crop loss due to insects.

Relationship Between Tomato Acres Planted, Characteristics of Production, and Production Practices Used

The majority of the producers (i.e., 22 of 30) planted a variety of tomato other than Jet Star, Supersonic, and Floradade varieties. These producers planted an average of 7.6 acres of tomatoes. This was larger than the other producers' acreage. Over 90 percent of the producers grew their own plants and averaged planting 7.5 acres of tomatoes. Most of the producers (i.e., 27 of 30), planted container grown plants and planted an average of 7.1 acres. The other producers used bareroot plants and planted an average of 5 acres. Family labor

was the primary labor source for 40 percent of the producers. Sixty percent of the producers used hired labor. Each group planted an average of 6.17 and 7.39 acres, respectively. None of the previously mentioned production characteristics was significantly related to acres of tomatoes grown.

Over sixty-six percent of the producers did not fertilize by soil test recommendations. They averaged planting 4.1 acres of tomatoes. The other 33 percent of the producers fertilized by soil test recommendations and averaged planting 12.5 acres. The acres planted and whether or not fertilizer was applied by soil test was significantly related. Producers who soil tested planted more acres.

The majority of the producers broadcast fertilizer (i.e., 19 of 30), and averaged planting 8.1 acres of tomatoes compared to the eleven other producers who planted 4.8 acres. Sixty percent of the producers did not lime by soil test recommendations. Those who did averaged planting significantly more acres than producers who did not lime by soil test.

Most of the producers (80 percent) used cultivation for weed control. These producers planted more acres than the producers who used herbicides or a combination of cultivation and herbicides. However, the differences were not significantly related as to practices and acres planted. The eight producers who used Treflan planted more acres than the two producers who used Sencor, but the difference was not significant. Most of the producers did not apply a herbicide. There was no significant relationship between when herbicides were

applied and acres planted. Although producers who applied herbicides before planting grew an average of 7.3 acres in comparison to the producers who applied herbicides after planting and planted an average of 7 acres.

Early blight was the major disease problem for 60 percent of the producers. Blossom end rot was the other major disease. These producers averaged planting between 4.3 and 11 acres of tomatoes and there was no significance between acres planted and major disease problems. Seventy percent of the producers applied fungicides after planting and averaged planting 7.2 acres of tomatoes. The other producers either applied fungicide before planting or did not apply fungicides. They planted an average of 7.4 and 1.5 acres, respectively. There was not a significant relationship between acres planted and when fungicides were applied. Maneb and Bravo were the primary fungicides used. Maneb users planted an average of 8.4 acres and Bravo users planted an average of 6 acres. Acres planted and fungicides used were not significantly related. Most producers (29) mixed fungicides and insecticides. The producers planted an average of 7 acres compared to the one producer who did not mix them and planted 1 acre. There was no significant relationship between acres planted and whether insecticides and fungicides were mixed. Fruitworms were the most serious insect problem for over 76 percent of the producers. Aphids affected the next largest percent of producers. These producers planted an average of 5.8 and 13.6 acres, respectively. There was not any significant relationship between acres planted and the most serious insect problem. Lannate was the most frequently used

insecticides for over 83 percent of the producers. They averaged planting 7.6 acres of tomatoes. Sevin was used by over 16 percent of the producers who planted an average of 13.6 acres. There was no significant relationship between acres planted and most frequently used insecticide. Insects were sprayed for from 0 to 9 times by various number of producers. The producers who planted the most acres also sprayed the most times for insects.

Producers reported yields sold per acre from 2 to 9 tons. They also averaged planting from 1.5 to 13 acres. There was no significant relationship between yields sold per acre and acres planted. Over 96 percent of the producers grew tomatoes for the early market. They planted an average of 7.1 acres of tomatoes. The majority of producers (76 percent) used both wholesalers and retailers as their major market outlet. These producers received their marketing information from buyers. The other producers received marketing information from farmers' markets and other farmers. There was no significant relationship between markets used and numbers of acres planted. Over 83 percent of the producers used the Extension Service as their primary source of tomato information. These farmers planted an average of 8 acres of tomatoes as opposed to the other producers who planted an average of 1.4 acres and used a source other than the Extension Service for tomato information. However, the acres planted was not significantly related as to where farmers got their tomato information.

Relationship Between Production Characteristics,
Production Practices Used, and Tons Sold Per Acre

The majority of producers (73 percent) planted a variety of tomato other than the Jet Star, Supersonic, and Floradade variety. These producers sold an average of 5.5 tons of tomatoes per acre. The producers who planted the named varieties had less yields per acre, but variety planted was not significantly related to tons sold per acre. Over 90 percent of the producers planted home grown plants. The other producers planted purchased plants. There was no significant yield increase in tons sold per acre of one over the other. There was no significant relationship between yields sold per acre and whether plants were container grown or bareroot. However, the large majority of producers (90 percent) use container grown plants. Producers either banded fertilizer or broadcast it. The yield difference was not significantly related as to use of either method. Over 93 percent of the producers sidedressed nitrogen when plants bore first fruit. They averaged selling 5.5 tons of tomatoes compared to the producers who did not sidedress and sold only 2 tons per acre. There was a significant relationship as to when nitrogen was applied sidedressed and yields sold per acre. Most producers sidedressed 1 or 2 times.

Sixty percent of the producers did not lime by soil test recommendations as compared to 40 percent who did. The practice was not significantly related to yields sold per acre even though the producers who limed by soil test sold a larger yield than producers who did not. Most producers (80 percent) used cultivation for weed

control. They sold an average of 5.1 tons per acre. The other producers used either herbicides or a combination of cultivation and herbicides for weed control. Their yields were higher per acre but there was not a significant relationship between method of weed control and yield sold per acre. Producers cultivated their tomato crop from 2 to 9 times and sold from 3 to 6 tons per acre. But, number of times cultivated was not significantly related to yield per acre sold. Treflan was the primary herbicide used by tomato producers. These producers sold an average of 4.8 tons of tomatoes per acre. Sencor users averaged 6.5 tons per acre. However, 66.6 percent of the producers did not use a herbicide. Their yield was 5.3 tons per acre sold. The primary herbicide used and yield sold per acre were not significantly related. The producers who applied a herbicide after planting had higher yields sold than those producers who applied herbicides before planting (i.e., 6.7 tons vs. 4.5 tons), but the majority of producers did not apply herbicides at either of these times. They sold an average of 5.2 tons per acre. When herbicides were applied and yield sold per acre were not significantly related.

Sixty percent of the producers considered early blight to be their major disease problem. The next largest percent of producers had to contend with blossom end rot. The yields sold per acre were similar for all producers and disease problems were not significantly related to yields sold per acre. All but two of the producers applied a fungicide to their crop either before planting or soon after planting. Their yields were significantly higher than the producers who did not apply fungicides at those times. Producers applied fungicides from

0 to 9 times, but there was no significant relationship between yield and times fungicides were applied. Maneb was the fungicide most used by over 53 percent of the producers. Bravo was next most used by 36 percent of the producers. There was no significant relationship between yield and fungicide used. Over 96 percent of the producers mixed insecticides and fungicides but there was no relationship between this practice and yield.

Over 76 percent of the producers reported fruitworms to be their major insect problem. The other producers had problems with aphids and cutworms. However, the yield sold per acre and major insect problems were not significantly related. Insecticides usage ranged from 1 insecticide used to 5 insecticides used. The producers who used more insecticides also had a higher yield sold per acre than producers who used only 1 insecticide. Lannate was the most frequently used insecticide by over 83 percent of the producers. However, there was no significant relationship between the insecticide used and yield sold per acre. Only one producer did not spray for insects. The other producers sprayed from 2 to 9 times. There was no significant relationship between yield sold and times sprayed. Crop loss due to insects ranged from no crop loss for 9 producers to a 10 percent crop loss for 2 producers. But, there was no significant relationship between crop loss to insects and yields sold per acre.

Over 96 percent of the producers grew tomatoes for the early market and the average yield sold per acre was 5.3 tons. The majority of producers (53.3 percent) depended on buyers for their major marketing information. These producers sold a few more tomatoes per acre but

there was not a significant relationship between yield sold per acre, market outlet and source of marketing information. Most of the producers (25 of 30) used the Extension Service as their primary source of tomato information. These 25 producers sold more tomatoes per acre (i.e., 5.3 vs. 4.8 tons) than did the 5 producers who got their primary tomato information elsewhere, but the differences were not found to be significant.

IV. IMPLICATIONS AND RECOMMENDATIONS

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

1. Only 10 percent of the producers did not have any contacts with Extension in 1980 through one of the contact methods (i.e., Extension meetings, tomato production and marketing meetings, visits to the Extension office, telephone calls, and farm visits). While the percentage is small, the positive correlation between certain practices used and Extension contacts deems it necessary that efforts should be made to reach all producers.
2. Producers who fertilized and limed by soil test recommendations planted significantly more acres of tomatoes. They also sprayed insects more frequently than producers with smaller acreages. If efforts were made to emphasize the importance of these practices, producers could possibly plant larger acreages and fertilize and lime more efficiently.
3. Indications are that producers who used the practices of sidedressing nitrogen at first fruit, applying fungicides before and

soon after planting, and using more than one insecticide had significantly higher yields of tomatoes sold per acre than did those producers who did not adhere to these practices. This would indicate that emphasis be placed on making all producers aware of these findings.

V. RECOMMENDATIONS

Program emphasis should be placed on reaching all producers and making them aware of study findings. Similar studies in all work areas would allow Extension educational program emphasis to be directed to those areas which would make the largest impact. Further emphasis should be made among Lauderdale County producers to further stress the importance of fertilizing and liming by soil test recommendations, planting recommended varieties, and using recommended herbicides.

BIBLIOGRAPHY

BIBLIOGRAPHY

1. Freeman, Pat Perkins. "Relationship Between Characteristics of Grade A Dairy Producers, Their Farming Operations and Their Use of Management Practices and the Number of Contacts They Had with Extension." Unpublished Master's Thesis, The University of Tennessee, Knoxville, 1978.
2. Gordon, Michael E. "Relationship Between Number of Contacts Haywood County, Tennessee, Feeder Pig Producers Had with the Agricultural Extension Service and the Management of Their Feeder Pig Operation." Unpublished Master's Thesis, The University of Tennessee, Knoxville, 1977.
3. Jenkins, Jamieson H. "Relationship Between Selected Characteristics of Soybean Producers and Their Management Practices and Participation in the Extension Program in Fayette County, Tennessee." Unpublished Master's Thesis, The University of Tennessee, Knoxville, 1977.
4. McLemore, Marcus F. "Selected Farm Characteristics of Swine Producers in Tennessee and Their Use of Recommended Production Practices in Relationship to the Number of Contacts Producers Had with County Extension Agents." Unpublished Master's Thesis, The University of Tennessee, Knoxville, 1979.
5. Perry, James Dewayne. "Relationship Between Characteristics of Tennessee Swine Producers, Number of Contacts They Had with County Agricultural Extension Agents and Numbers of Recommended Swine Production Practices Adopted." Unpublished Master's Thesis, The University of Tennessee, 1980.
6. Tennessee Agricultural Statistics. Annual Bulletin 1980. United States Department of Agriculture and Tennessee Department of Agriculture. Tennessee Crop Reporting Service, September 1980.
7. United States Department of Agriculture. Agricultural Statistics. United States Government Printing Office, 1979.
8. United States Department of Commerce Bureau of the Census. 1978 Census of Agriculture Preliminary Report Lauderdale County, Tennessee. Issued 1980.
9. The University of Tennessee Agricultural Extension Service, Publication 452. "Chemical Weed Control in Fruits and Vegetables." Knoxville, Tennessee, 1982.

10. The University of Tennessee Agricultural Extension Service, Publication 716. "How to Control Vegetable Diseases." Knoxville, Tennessee, 1982.
11. The University of Tennessee Agricultural Extension Service, Publication 817. "How to Control Commercial Vegetable Insects." Knoxville, Tennessee, 1982.
12. The University of Tennessee Agricultural Extension Service, Publication 737. "Growing Staked Tomatoes in Tennessee." Knoxville, Tennessee, 1982.
13. Wilson, Meredith C. and Gladys Gallup. "Extension Teaching Methods." Extension Service Circular 495. Washington, D.C., Federal Extension Service, U.S. Department of Agriculture, 1955.
14. Yabaya, Solomon Ahyuwa. "Relationships Between the Frequency of Contacts Corn Producers in Tennessee Had with County Extension Agents and Their Adoption of Eight Corn Production Practices." Unpublished Master's Thesis, The University of Tennessee, Knoxville, 1978.

APPENDIX

THE AGRICULTURAL EXTENSION SERVICE
UNIVERSITY OF TENNESSEE
KNOXVILLE, TENNESSEE

COMMERCIAL TOMATO PRODUCTION 1980 SURVEY
(See Instructions on Last Page)

_____ Date Surveyed _____
County Name _____

Name of Producer _____

Address _____

$\frac{1}{(1)}$ Card Number 1

$\frac{0}{(2)}$ $\frac{0}{(3)}$ $\frac{0}{(4)}$ Producer Number (leave blank)

A. Production Information*

$\frac{\quad}{(5)}$ $\frac{\quad}{(6)}$ 1. How many acres of tomatoes were planted
(actual acres - rounded to nearest acre)?

$\frac{\quad}{(7)}$ 2. What was the predominant variety grown
(1 = Floradade; 2 = Floriamerica; 3 =
Walter; 4 = Royal Flush; 5 = Better Boy;
6 = Bradley; 7 = Big Seven; 8 = Supersonic;
9 = Jet Star; 10 = Other _____)?

Plant Production (Publication #737 or
Publication #819)

$\frac{\quad}{(8)}$ 3. Were plants purchased or home produced
(1 = purchased; 2 = home grown)?

$\frac{\quad}{(9)}$ 4. Were plants container grown or bareroot
(1 = container; 2 = bareroot)?

*Coding instructions:

1. All entries are right justified;
2. A zero = none or not any;
3. A nine in each column = do not know, doesn't apply or no response.

Field Fertilization (Publication #737)

- (10) (11) (12) (13) 5. How many pounds of complete fertilizer was applied per acre (actual pounds)?
- (14) (15) 6. At planting time, how many pounds of nitrogen (N) were applied (actual pounds)?
- (16) (17) 7. At planting time, how many pounds of potash (K_2O) were applied (actual pounds)?
- (18) (19) 8. At planting time, how many pounds of phosphate (P_2O_5) were applied (actual pounds)?
- (20) (21) 9. Was fertilizer applied according to soil test (1 = no; 2 = yes)?
- (22) (23) 10. Was lime applied according to soil test (1 = no; 2 = yes)?
- (24) 11. Was fertilizer banded or broadcast (1 = banded; 2 = broadcast)?
- (25) (26) 12. How many pounds of nitrogen (N) were applied as sidedressing (pounds of actual "N" per acre)?
- (27) 13. How many times was nitrogen applied as sidedressing (actual number)?
- (28) 14. What was the plant size when nitrogen was applied as a sidedressing (1 = at first bloom; 2 = 12" tall; 3 = first fruit cluster about one inch in diameter; 4 = none applied as sidedressing)?

Weed Control (Publication #452)

- (29) 15. What was the primary weed control method used (1 = cultivation; 2 = herbicides; 3 = herbicides plus cultivation; 4 = other _____)?
- (30) 16. How many times was cultivation done (actual)?
- (31) 17. Were herbicides applied before or after planting (1 = before; 2 = after; 3 = none applied)?

18. What was the primary herbicide used
 (32) (1 = Treflan; 2 = Diphenamid; 3 = Sencor
 or Lexone; 4 = Dacthal; 5 = Tillam; 6 =
 Devrinol; 7 = none applied)?
19. What percent (%) of crop loss was due to
 (33) (34) weeds (actual percent loss)?

Disease Control (Publication #716)

20. What was the primary fungicide used (1 =
 (35) Fixed Copper; 2 = Maneb; 3 = Bravo; 4 =
 Dyrene; 5 = Methyl Bromide; 5 = none
 used)?
21. When was the fungicide first applied
 (36) (1 = before field transplanting; 2 = soon
 after plants were established; 3 = after
 disease first appeared; 4 = fungicide not
 used)?
22. How many times was the fungicide applied
 (37) in the field (actual)?
23. Type sprayer used to apply fungicide
 (38) (1 = drop nozzle; 2 = air blast; 3 = knap-
 sack; 4 = mist blower; 5 = other_____)?
24. What type of pump was used (1 = piston;
 (39) 2 = roller; 3 = centrifugal; 4 =
 other_____)?
25. What type nozzles were used on the sprayer
 (40) (1 = cone; 2 = flat; 3 = fan; 4 = flood;
 5 = other_____)?
26. What was the major disease problem (1 =
 (41) early blight; 2 = late blight; 3 = blossom
 end rot; 4 = fusarium wilt; 5 = verticillium
 wilt; 6 = gray mold; 7 = bacterial canker;
 8 = botrytris; 9 = no disease problem -
 less than 10% loss; 10 = other_____)?
27. What percent (%) of crop loss was due to
 (42) (43) disease (actual percent loss)?
28. Were fungicides mixed with insecticides
 (44) (45) (1 = no; 2 = yes)?

Insect Control (E. C. #817)

29. How many times did you spray for insects (actual)?
 (46)
30. How many different insecticides were used (actual)?
 (47)
31. Name the insecticide used most frequently (1 = Diazinon; 2 = Thiodan; 3 = Sevin; 4 = Di-Syston; 5 = Dipel; 6 = Lannate or Nudrin; 7 = Malathion; 8 = other_____; 9 = none used).
 (48)
32. Name the most serious insect problem encountered (1 = aphids; 2 = cutworms; 3 = fruitworms; 4 = hornworms; 5 = loopers; 6 = other_____.
 (49)
33. What percent (%) of crop loss was due to insects (actual percent loss)?
 (50) (51)
34. What was your primary source of tomato production information (1 = Extension; 2 = other)?
 (52)

B. Harvesting and MarketingHarvesting

35. What was your major source of labor for harvest (1 = only family labor used; 2 = pick-your-own labor; 3 = locally hired labor; 4 = migrant labor; 5 = other_____)?
 (53)
36. What percents of the crop were harvested at the following stages:
- a. Percent (%) harvested at mature green stage (actual percent)?
 (54) (55) (56)
- b. Percent (%) harvested at breaker stage (actual percent)?
 (57) (58) (59)
- c. Percent (%) harvested at pink stage (actual percent)?
 (60) (61) (62)
37. Where were tomatoes graded (1 = in the field; 2 = farmer's packing shed; 3 = packinghouse off farm; 4 = sold ungraded; 5 = other_____)?
 (63)

Marketing

38. Were tomatoes grown for the early or late market (1 = early; 2 = late; 3 = both early and late)?
 (64)
39. What was your major source of market information (1 = Extension; 2 = farmer's market; 3 = other farmers; 4 = produce buyer; 5 = other _____)?
 (65)
40. What was the major market outlet (1 = packing shed; 2 = wholesalers or retailers; 3 = grocery stores; 4 = farmer's market; 5 = pick-your-own; 6 = cooperatives; 7 = truckers in field; 8 = other _____)?
 (66)
41. How many tons of tomatoes were sold (actual tons sold - nearest whole ton)?
 (67) (68)
42. What was your yield per acre in tons (actual tons of tomatoes sold per acre grown - nearest whole ton)?
 (69) (70)
43. What was the approximate date of your first sale (record the month in column 71 and the day in columns 72 and 73)?
 (71) (72) (73)
44. What was the highest price received per pound (actual cents per pound)?
 (74) (75)
45. What percent of crop was sold at the highest price per pound (actual percent)?
 (76) (77) (78)
46. What was the lowest price received per pound (actual cents per pound)?
 (79) (80)

2
 (1) Card Number 2

0 0 0
 (2) (3) (4) Producer Number (leave blank)

C. Extension Contacts

47. Over the past 12 months, approximately how many contacts did you have with Extension Agents through:

- | | |
|--|---|
| <u>(5)</u> <u>(6)</u>

<u>(7)</u>

<u>(8)</u> <u>(9)</u>

<u>(10)</u> <u>(11)</u>

<u>(12)</u> <u>(13)</u> | <p>a. Extension meetings of all types (actual number)?</p> <p>b. Extension meetings on tomato production and marketing (actual number)?</p> <p>c. Visits made to the Extension office (actual number)?</p> <p>d. Telephone calls made to Extension office (actual number)?</p> <p>e. Farm visits by Extension Agents (actual number)?</p> |
|--|---|

D. General Instructions for 1980 Tomato Survey

1. Date Due: November 1, 1980
2. Disposition: Mail completed survey forms to the Associate District Supervisor Agricultural Programs, for forwarding to Agricultural Extension Education.
3. Counties to be Surveyed:
 District I: Fayette, Gibson, Lauderdale and Shelby
 District II: Davidson, Williamson
 District III: Bledsoe, Hamilton and Rhea
 District IV: Cumberland
 District V: Claiborne, Cocke, Grainger, Greene, Jefferson, Johnson, Knox, Unicoi, Washington
 Other Counties: Any other county with one or more producers growing at least 1/2 acre of tomatoes as a cash crop also may want to do the survey.
4. Population: Commercial tomato producers who grew at least 1/2 acre of tomatoes for sale in 1980.
5. Sample Size:
 - a. Counties with from one to 15 producers, survey all of them.
 - b. Counties with from 16 to 25 producers, survey 15.
 - c. Counties with from 26 to 50 producers, survey 20.
 - d. Counties with from 51 to 100 producers, survey 25.
 - e. Counties with over 100 producers, survey 30.

6. Sampling Procedures:

- a. Use a list of all tomato producers who grew at least 1/2 acre in 1980.
- b. Use the Nth number technique to identify those producers who will be interviewed. Select two or three other producers to serve as alternates.

LAUDERDALE COUNTY
Tomato Survey
Supplement

3

Card No. #3

County No.

(2) (3) (4)(5) (6) (7) (8)

1. How many acres do you farm?

2. How much of the harvested acres of tomatoes grown do you:

a. Own (actual acres)

(9) (10)

b. Rent (actual acres)

(11) (12)

c. Shared (actual acres)

(13) (14)3. What is your major source of farm income
(1 = vegetables; 2 = livestock; 3 =
row crops)?(15)4. What is your major grass problem
(1 = johnsongrass; 2 = crabgrass; 3 =
goosegrass; 4 = other_____)?(16)5. What is your major weed problem?
(1 = cocklebur; 2 = purselane; 3 = spiny
amarantha; 4 = other_____)?(17)6. What type of container do you use to market
most of your tomatoes (1 = bushel basket;
2 = half bushel basket; 3 = 20 lbs. card-
board container; 4 = 40 lbs. cardboard
container; 5 = other_____)?(18)

VITA

William Gerald Parker was born October 28, 1949, to Mr. and Mrs. Robert L. Parker of Madison County, Tennessee. He began his formal education at Fairview Elementary School and attended North Side High School, graduating in 1967.

He attended Jackson State Community College at Jackson and completed requirements for an Associate Degree in Science in 1969. After serving in the United States Army, he enrolled at The University of Tennessee at Martin in 1972. Requirements for a Bachelor of Science Degree in Animal Husbandry were completed in 1975.

He was employed as an Assistant Extension Agent in Lauderdale County, Tennessee, in November, 1976.

He is married to the former Elaine Raye Beaty of Memphis, Tennessee, and they have two children, Brian (age 6) and April (age 3).

He is a member of the Ripley Exchange Club and the First Baptist Church of Ripley.