To the Graduate Council:

I am submitting herewith a thesis written by Ronald B. Johnson entitled "Relationships Between Characteristics of Corn Producers, Their Farming Operations and Their Use of Recommended Production Practices and the Number of Contacts They Had With Extension in 1979." 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

RELATIONSHIPS BETWEEN CHARACTERISTICS OF CORN PRODUCERS, THEIR FARMING OPERATIONS AND THEIR USE OF RECOMMENDED PRODUCTION PRACTICES AND THE NUMBER OF CONTACTS THEY HAD WITH EXTENSION IN 1979

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Ronald B. Johnson

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ABSTRACT

The major purpose of this study was to determine the relationships between the characteristics of corn producers and their farm operations, their use of recommended production practices, and their participation in Extension programs in 1979.

A total of 1,985 personal interviews were conducted by agents in Tennessee. The analysis of variance F test statistic was used to determine the association between each dependent variable and each of the qualitative independent variables. F values which achieved the .05 level of probability were accepted as being statistically significant.

Major findings included the following:

1. Findings indicated that the mean number acres of yellow corn harvested in 1979 was just over 65; the mean number acres of white corn harvested was almost 59; the mean number acres of silage harvested was 48; average bushels of grain per acre was almost 95; and the average tons silage per acre was 18.
2. Findings indicated that producers who used more of the total of ten recommended practices in 1979 harvested significantly more bushels of corn for grain and tons of silage per acre.
3. Of the ten recommended practices studied, liming according to soil test, fertilizing according to soil test, and fertilizing silage land according to soil test were the practices most highly related to yield of corn for grain and corn for silage in 1979.

4. In characterizing corn producers as to their use of soil management practices, only strip cropping was significantly related to all five methods of Extension contacts. Producers who used this management practice had more contacts with Extension in 1979.
5. Producers who used the recommended corn production practices in 1979 contacted Extension more frequently than those who were not using the practices. However, only planting recommended plant population, liming according to soil test, and fertilized according to soil test were significantly related to all five methods of Extension contacts.
6. Findings indicated that producers who contacted Extension more often tended to harvest more total acres of corn for grain and silage. The number of contacts producers had with Extension in 1979 tended to be significantly related to the yield of corn for grain and corn for silage.
7. Findings showed that the use of each management practice was not significantly related to the total acres of corn harvested for grain. Only three management practices farmers reported using in 1979 were significantly related to the total acres of corn harvested by each producer. They were corn for grain deuble cropped following small grains, corn for grain using minimum tillage, and corn for silage using conventional tillage. Implications and recommendations also were included.

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CHAPTER I

THE PROBLEM AND ITS SETTING

I. INTRODUCTION

The largest crop grown in America is corn. It was grown by the American Indians and aided in the settlement of the New World. Corn is now the backbone of American agriculture, which exceeds the combined totals of wheat, oats, soybeans for beans, barley and rye in production. (5)* The 1980 production of corn for grain was estimated at 6.65 billion bushels. (11)

Corn is an important part of Tennessee's agricultural industry, ranking sixth among agricultural commodities with cash receipts of $52,491,000 in 1979 totaling 3% of the state's agricultural receipts. (9) Corn has steadily decreased in value since 1951 when it ranked first. (10) But corn is a two-value crop statistically. Corn has farm value, which is corn used as feed on the farm; and cash value, which represents all corn sold. It is fed to animals which produce steaks, hams and milk. Corn cobs are used to make pipes, and bourbon also is made from the grain. Corn is eaten as bread, cereal, grits and hush puppies. Thus, corn is an important part of the complex web of the nation's food system. (12)

There is a trend for farms to become fewer and larger. Farmers will need to become even better managers to keep larger operations

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

efficient. Corn producers must try different methods to combat old problems that affect corn yields. Of course, nature will play a vital role in crop production; like the drought in 1980.

The University of Tennessee Agricultural Extension Service has played an integral part in Tennessee's agricultural industry. The Extension Service has a responsibility to farm leaders in supplying updated information. Through the local county Extension agent, farmers learn the latest in agriculture research and how to apply practical information. Agents disperse information concerning corn production practices using four main types of Extension contact methods, (i.e. meetings, farm visits, office visits and telephone calls). Use of this information varies among corn producers. There exists a gap between actual corn yields and potential corn yields.

This study then was conducted to characterize corn producers and to study relationships between the number of contacts producers had with Extension agents and the use of recommended corn production practices.

II. NEED FOR THE STUDY

Tennessee Extension Agents are continually striving to improve the effectiveness of their educational efforts. One major objective of the Tennessee Agricultural Extension Service is to encourage the adoption of recommended Agriculatural and Home Economics practices. All agencies involved in serving the public, agriculture or other, are striving for increased accountability to taxpayers and legislators.

It was believed that data from the 1979 Corn Production Survey would provide information which would help improve programs of the Tennessee Agricultural Extension Service. Also, that the information would assist local county Extension agents to evaluate and to determine priorities and directions of change.

III. PURPOSE AND OBJECTIVES OF THIS STUDY

The purpose of this study was to characterize corn producers and their operations, as to their use of recommended production practices, yields, their contacts with Extension and to determine the relationships among these variables.

The specific objectives were:

1. To characterize the corn producers in Tennessee and their farming operations.
2. To determine the relationship between the number of recommended corn production practices used by producers and the yield per acre of corn harvested for grain and for silage.
3. To determine relationships between the producer's use of each of the ten recommended practices and their yield per acre of corn harvested for grain and for silage.
4. To determine relationships between the characteristics of corn producers and the number of contacts they reported having with Extension agents.
5. To determine relationships between producers' use of ten recommended corn production practices and the number of contacts they reported having with Extension agents.

6. To determine the relationship between the number of contacts producers had with Extension agents and the yield per acre of corn for grain and for silage.

7. To determine the relationship between the producers' use of soil management practices and the total acres of corn harvested.

IV. LIMITATIONS OF THE STUDY

This study was limited to the analysis of data from the 1979 Tennessee Agriculture Extension Service Corn Production Survey conducted in the fall of 1979. The data were obtained by Extension agents through personal interviews with 1,985 corn producers in the major corn producing counties of Tennessee. Agents in each county surveyed thirty producers, or all producers if there was less than thirty in the county who grew at least ten acres of corn for grain or for silage. The number interviewed usually varied from county to county though, depending on the number of corn producers in each county.

V. METHODS OF INVESTIGATION

Population and Sample

The population of this study included corn producers in Tennessee. Data were obtained through personal interviews by Extension agents using interview schedules developed by Specialists at The University of Tennessee. Each agent was instructed to use the Nth number to randomly select thirty corn producers. If the county had less than thirty, then the agent was instructed to survey all corn producers. Each producer surveyed

was to have grown ten acres or more of corn for grain or silage. Completed surveys were returned to the Agricultural Extension Education Office.

Method of Analysis

Data on the situation of corn producers in 1979 were coded, and computer data cards were punched. Computations and statistical analyses were made by the University of Tennessee Computering Center.

Responses to survey questions were summarized using means and frequency counts of producers' reposonses regarding the use of the mean number of contacts producers reported having with Extension agents as well as mean acres and yields per acre of corn for grain and for silage.

One-way analysis of variance was used to determine the relationship between dependent and independent variables. Statistical tables were used to determine the significance of observed relationships. F-values achieving the .05 level were judged to be significant.

VI. DEFINITION OF TERMS

Annual Plan of Work (POW)--The written end product of county Extension planning.

Correlation--An interdependence between mathematical variables in statistics. Provides a single summary statistic describing the strength of association between two variables.

Corn Producers--This refers to individuals making all or part of their farming income from the production of corn either for sale or to be used on their own farm for feed. They constitute the target audience of this study.

County Extension Program--Each county in Tennessee has one county Extension program. All Extension work done in the county, including planning, evaluation, and reporting progress made toward annual (POW) plans and five-year (POWP) objectives and goals. Each county Extension program diffuses information on Agriculture, Home Economics, 4-H (youth) and Rural Development.

Extension Contact--The number of Extension office visits made, number of Extension farm visits received, number of Extension group meetings attended, the number of telephone calls to the Extension office, and the total number of Extension contacts made with corn producers during the past twelve-month period.

Practice--A research verified and commonly accepted procedure or task, which, if performed correctly and on a regular basis, will increase or help insure a desired outcome or return.

Variable (Dependent)--The variable which one wishes to explain as a function of other variables. (Independent)--The explanatory variable in a statistical analysis.

CHAPTER II

REVIEW OF RELATED STUDIES

Available studies were reviewed relating to: (1) Characteristics of producers and their farm operation, (2) Studies of their use of production practices and yields per acre or per animal unit, (3) Relationships between the use of production practices and the number of contacts producers had with Extension agents, and (4) Relationships between the characteristics of producers and the number of contacts producers had with Extension agents.

I. CHARACTERISTICS OF PRODUCERS AND THEIR FARM OPERATIONS

A review of related studies describing the average farm operation in Tennessee revealed that the average farm in 1980 contained 148 acres. The average gross income per farm was $21,895, and the average net income per farm was $3,414. (9) Data also indicated that the average size of farms in Tennessee has been increasing each year.

Pat Freeman in 1978, found that the average Tennessee Grade A dairyman was 50 years old, and a high percentage owned his farm. (2) He had completed high school and had been milking for 23 years. This study found that the dairyman employed one additional full-time worker, milked 65 cows and operated 350 acres of cropland. The farmer also averaged producing 14 tons of corn silage per acre. However, another

study completed in 1977 found that 50% of the dairy producers had not increased their acreages. (6)

II. STUDIES RELATING TO THE USE OF PRODUCTION PRACTICES AND YIELDS PER ACRE OR PER ANIMAL UNIT

Studies have shown a direct relationship between the use of recommended production practices and yields. In Yabaya's study of corn producers completed in 1978, one finding was that yield of corn for grain and silage was significantly related to the producer use of 8 recommended corn production practices. (14) Corn producers who used these practices harvested more bushels of grain and more tons of silage than those who did not use them.

A 1980 study found that cotton producers used an average of 5.7 of the 9 recommended production practices. (1) These data were obtained from 261 randomly selected cotton producers in 16 counties where at least 1,000 acres of cotton was grown. The more practices used by the producer, the higher their per-acre yield of cotton.

An interesting study of soybean producers in Marion County, Tennessee, found that 85% of the 38 producers surveyed were, on the average, in the using stage with regard to 11 recommended practices. (3)

The use of recommended practices by dairy farmers and swine producers has a direct relationship on the production per animal unit. Two studies of swine producers in Tennessee found that a high percentage of producers were not using the recommended practices. (7,8) McLemore's study found that most producers used less than 10 of the 25 production

practices recommended by The University of Tennessee. Perry's study in 1980 found that 60% of swine producers used 8 to 14 of the recommended practices. He also found that 3% used all 14 practices, while only 2.5% did not use any. Pat Freeman's study of Grade A dairy farmers in 1978 found that the dairymen who had high herd averages in pounds of milk and butterfat tended to use significantly more of the total number of recommended practices. (2) Those dairymen who had lower herd averages used fewer of the practices.

III. STUDIES RELATING TO THE USE OF PRODUCTION PRACTICES AND THE NUMBER OF CONTACTS PRODUCERS HAD WITH EXTENSION AGENTS

Studies reported in this section were found to be conflicting in some cases. Some studies found that the use of production practices was related to only one type of Extension contact, while others found that only selected practices were related to Extension contacts.

Many studies were found regarding practices as related to the type and number of Extension contact. In Hall's 1971 study of soybean producers, all of the high yield producers listed Extension bulletins, newspapers, radio, farm meetings, commercial bulletins, field days and television as important sources of information. (3) These were listed in order of frequency mentioned by farmers. Freeman found that the Grade A milk producers' total number of Extension contacts and the number of Extension farm visits he received were significantly related to the total number of practices he used. (2)

Wilson and Gallup reported that approximately 13% of all changes in the use of recommended practices were a result of farm visits producers received from Extension agents. (13) Approximately 15% of the changes in practices used by farmers were due to Extension meetings they had attended, and 6% of the practice changes were due to Extension office calls. Extension contacts, then that were most influential in producers' use of recommended practices were farm visits, meetings, and office calls.

Other studies found that Extension contacts were significantly related to the use of selected recommended practices. McLemore found in his study that the total number of contacts swine producers had with Extension was significantly related to their use of 23 of the 25 recommended swine practices studied. (7) It was implied that either Extension was spending time contacting producers already using the recommended practices or that producers are using them as a result of Extension contacts. He recommended in either case, that Extension should make more effort to contact those producers who had fewer contacts in the past. (1,8) Bradley showed that all but two of the 9 recommended cotton practices were significantly related to the total number of Extension contacts made. (1) Perry's study found that there was a significant relationship between the use of 9 of the recommended swine practices and the number of contacts producers had through meetings, office visits, telephone calls, and the total number of Extension contacts. (8)

A 1978 corn study found that the total number of Extension contacts were significantly related to 5 out of 8 practices used by

producers. These producers had more total contacts with Extension than those not using the practices. The practices that were not related to Extension contacts were planting dates, weed control and harvesting at recommended maturity stage.

IV. STUDIES RELATING TO THE CHARACTERISTICS OF PRODUCERS AND THE NUMBER OF CONTACTS PRODUCERS HAD WITH EXTENSION AGENTS

Several studies were found concerning characteristics of producers and the number of contacts they had with Extension.

In Yabaya's and Freeman's studies, it was found that the number of Extension contacts increased as the size of the farming operation increased. (14,2) Yabaya also found that corn producers who harvested more acres of silage and who had higher yields also had more contacts with Extension agents. Freeman's dairy study revealed that as age of the farmer increased, the number of contacts made with Extension agents decreased. He also found that the more educated farmers were likely to make a larger number of office visits as well as those that had higher herd averages in pounds of milk.

Two studies found that full-time farmers in soybean and swine production tended to have more contacts with Extension than part-time farmers. (4,8) The part-time soybean producers attended fewer Extension meetings. The swine study showed that there was a significant relationship between the method of marketing their hogs and the number of contacts they had with Extension agents.

CHAPTER III

SURVEY FINDINGS

Findings of the study are presented in seven tables. These findings were organized and are reported in seven sections. Each table presents findings regarding several variables. Each variable is discussed under a separate section.

Section I presents findings regarding characteristics of the corn producers and their farming operation.

Section II presents findings regarding the total number of recommended practices used and the yield per acre of corn for grain and silage.

Section III presents findings regarding the use of each of the ten recommended practices and the yield per acre of corn for grain and silage.

Section IV presents findings regarding the use of management practices and Extension contacts.

Section V presents findings regarding the relationship between Extension contacts and the use of the ten recommended practices.

Section VI presents findings regarding the yield per acre of corn for grain and silage and the number of contacts with Extension.

Section VII presents findings regarding the relationship between management practices and the total acres of corn harvested.

I. CHARACTERISTICS OF CORN PRODUCERS AND THEIR FARM OPERATIONS

Findings regarding five variables selected to characterize the corn producers and their farm operations are presented in Table I. The five variables show the scope of the farm operations. In all cases, the number and the percent of producers are shown. The mean is also given for these quantitative variables.

Acres Yellow Corn Harvested

Table I shows that about 50% of the 1,714 corn producers harvested 30 acres or less. Between 31 - 100 acres were harvested by about 35% of the producers. Only 15% harvested 101 -499 acres. Eight farmers, making up less than 1% of the total, harvested 500 or more acres. The largest yellow corn producer harvested 1,150 acres in 1979. On the average, each of the 1,714 producers harvested just over 65 acres of yellow corn for grain in 1979.

Acres White Corn Harvested

Only 136 of the 1,985 producers surveyed were growing white corn in 1979. The largest white corn producer harvested 1,000 acres in 1979. The mean acres of white corn harvested by the 136 producers was almost 59. Analysis of the acres of white corn harvested revealed that almost 48% of the producers harvested less than 20 acres, while just over 2% harvested 300 acres and over.

TABLE I

CHARACTERISTICS OF CORN PRODUCERS AND THEIR FARM OPERATIONS

Name of Variable	Number Of Producers	Percent Of Producers
Acres Yellow Corn Harvested		
Under 30	851	49.7
31--100	598	34.8
101--499	257	15.0
500 and over	8	.5
Mean = 65.3		
Acres White Corn Harvested		
Under 20	65	47.8
21--100	54	39.7
101--299	14	10.3
300 and over	3	2.2
Mean = 58.7		
Acres Silage Harvested		
Under 30	308	47.1
31--100	301	45.0
101--300	53	7.9
301 and over	0	0.0
Mean = 48.0		
Bushels Grain Per Acre		
Under 80	522	30.1
81--100	686	39.6
101--150	503	29.0
151 and over	22	1.3
Mean = 94.5		
Tons Silage Per Acre		
Under 15	195	29.8
16--20	342	52.3
21--27	109	16.7
28 and over	8	1.2
Mean = 18		

Acres Silage Harvested

The mean number of acres harvested for silage by the 662 silage producers was 48 acres. Fifty-three farmers (about 8%) of the silage producers harvested between 101 and 300 acres. No producers harvested over 300 acres of silage, while almost 50% harvested 30 acres or less in 1979.

Bushels Grain Per Acre

The number of bushels of grain produced per acre ranged from a low of 29 to a high of 200. The mean bushels of grain produced per acre by the 1,743 producers reporting was almost 95 in 1979. Twenty-two farmers or 1.3% stated that they harvested 151 bushels and over per acre.

Tons Silage Per Acre

The mean tons of silage produced per acre by the 654 producers surveyed in 1979 was 18. Eight producers (i.e. 1.2%) harvested 28 and over tons of silage per acre. Over half of the producers surveyed had a yield of between 16 and 20 tons of corn silage per acre in 1979.

II. RELATIONSHIP BETWEEN THE YIELD/ACRE OF CORN HARVESTED FOR GRAIN, YIELD/ACRE OF SILAGE HARVESTED AND THE TOTAL NUMBER OF RECOMMENDED CORN PRODUCTION PRACTICES USED BY THE PRODUCER IN 1979

Findings regarding the relationship between corn producers' use of ten recommended corn production practices and corn yield, in bushels

TABLE II

RELATIONSHIP BETWEEN THE YIELD/ACRE OF CORN HARVESTED FOR GRAIN, YIELD/ACRE OF SILAGE HARVESTED AND THE TOTAL NUMBER OF RECOMMENDED CORN PRODUCTION PRACTICES USED BY THE PRODUCER IN 1979

Total No. of Recommended Corn Prod. Practices Used	Yield/Acre of Grain In Bushels		Yield/Acre of Silage In Tons	
	No. Resp.	Mean	No. Resp.	Mean
0	10	99.7	3	15.0
1	11	75.5	2	19.0
2	27	71.4	4	13.8
3	54	77.1	9	14.9
4	138	79.9	18	16.4
5	277	88.6	68	16.5
6	425	95.9	88	17.9
7	292	98.0	142	18.1
8	283	101.4	77	17.7
9	100	100.4	124	18.8
10	116	104.8	119	18.5
TOTALS	1733	94.5	654	18.0
F Value	21.6		3.6	
p Level	0.000		0.000	

for grain and in tons of corn silage, for the year 1979 are presented in Table II.

Findings were organized and reported in two subsections. The purpose was to show the relationship between yield per acre of corn for grain and silage and the total number of recommended corn production practices in 1979.

Relationship Between Per Acre Yield in Bushels Of Corn Grown for Grain and Total Number of Recommended Corn Production Practices Used

Findings summarized in Table II indicate that the 1,733 corn producers who responded had an average per acre yield of almost 95 bushels of corn for grain in 1979. A large number of the producers were using less than 6 of the 10 recommended practices. These producers averaged between 71.4 and 99.7 bushels of grain per acre. The mean for this low group was 82 bushels per acre. The remaining 1,216 producers were using 6 or more of the 10 recommended practices and had an average per acre yield of 100.1 bushels of grain. The analysis of variance F test showed that yield per acre of grain was significantly related to the total number of recommended practices used by the 1,733 corn producers. These data indicate that producers who were using more of the recommended practices had higher per acre yields than those who used fewer of the practices.

Relationship Between Per Acre Yield in Tons Of Corn Harvested for Silage and Total Number Of Recommended Corn Production Practices Used

Findings presented in Table II indicate that the 654 corn producers had an average per acre yield of 18 tons of corn for silage in 1979.

Many of the producers were using less than 6 of the 10 recommended practices. These producers averaged 15.9 tons of corn for silage per acre. The remaining 550 producers were using 6 or more of the 10 recommended practices and had an average per acre yield of 18.2 tons of corn for silage. The analysis of variance F test showed that yield per acre of corn for silage was significantly related to the total number of recommended practices used by the 654 corn producers. These data indicate that producers who were using more of the recommended practices had higher per acre yields than those who used fewer of the practices.

III. RELATIONSHIP BETWEEN YIELD PER ACRE AND USE OF RECOMMENDED CORN PRODUCTION PRACTICES BY GRAIN PRODUCERS

Findings are presented in Table III regarding corn yield per acre and the producers' use of each of ten recommended corn production practices during the year 1979. Corn producers were classified as either users or non-users of each practice. The mean bushels of grain produced per acre harvested were computed for producers who were and those who were not using each practice. One-way analysis of variance F-test was used to determine the significance of observed differences in yield among users compared to non-users of each practice. F-values which achieved the .05 level were considered to be significant. Findings presented in this section were organized according to each recommended practice.

TABLE III

RELATIONSHIP BETWEEN YIELD/ACRE OF GRAIN IN BUSHELS AND YIELD/ACRE OF SILAGE IN TONS AND WHETHER OR NOT THE PRODUCERS WERE USING EACH OF THE TEN RECOMMENDED CORN PRODUCTION PRACTICES IN 1979

Recommended Corn Production Practice	Yield/Acre of Grain In Bushels						Yield/Acre of Silage In Tons					
	No		Yes				No		Yes			
	No. Resp.	Mean	No. Resp.	Mean	F Value	p Level	No. Resp.	Mean	No. Resp.	Mean	F Value	p Level
Planted Recommended Variety	123	85.2	1545	95.2	21.2	0.000	37	15.9	585	18.1	11.8	0.000
Planted During the Recommended Season	219	83.3	1496	96.1	58.5	0.000	101	16.8	548	18.2	10.2	0.001
Planted Recommended No. of Plants/Acre	218	80.1	1488	96.7	101.6	0.000	54	17.1	587	18.1	3.3	0.070
Limed According to Soil Test Recommendations	928	90.4	761	99.5	64.8	0.000	296	17.5	337	18.4	9.0	0.002
Land For Grain Fertilized According to Soil Test Recommendations	921	91.1	751	98.5	42.9	0.000						
Land For Silage Fertilized According to Soil Test Recommendations							282	17.5	343	18.5	11.1	0.000
Mixed Fertilizer Applied According to Recommendations	256	92.6	1439	94.8	1.8	0.177	112	18.2	526	17.9	.5	0.473
Nitrogen Fertilizer Applied According to Recommendations	192	85.3	1451	95.8	35.0	0.000	79	17.3	555	18.1	2.9	0.092
Controlled Weeds According to Recommendations	198	81.6	1472	96.2	70.6	0.000	60	16.1	571	18.2	17.2	0.000
Silage Harvested at the Recommended Time							50	17.6	596	18.0	.4	0.510

Planted Recommended Variety

Findings presented in Table III regarding corn yield and the practice "Planted recommended variety" indicated that producers who used this practice in 1979 had an average yield of 10 more bushels per acre than the non-users (95.2 vs. 85.2). This difference in yield between users and non-users of this practice was significant at the .05 level. Thus, producers who used recommended varieties did make a significantly higher yield of grain per acre in 1979.

Planted During the Recommended Season

Findings regarding corn yield and the practice "Planted during the recommended season" indicated that producers who used this practice in 1979 had an average yield of 12.8 more bushels per acre than the non-users (96.1 vs. 83.3). The difference in yield between the users and the non-users of this practice was significant at the .05 level. Thus, planting during recommended season was significantly related to corn yield in 1979.

Planted For Recommended Stand of Corn Plants Per Acre

Findings regarding corn yield and the practice "Planted recommended stand of corn plants per acre" indicated that producers who used this practice in 1979 had an average yield of 16.7 more bushels than the non-users (96.7 vs. 80.1). This difference in yield between users and non-users of this practice was significant at the .05 level. Thus, planting recommended stand of corn plants per acre was significantly related to corn yield in 1979.

Limed According to Soil Test Recommendations

Findings regarding corn yield and the practice "Limed according to soil test recommendations" indicated that producers who used this practice in 1979 had an average yield of 9.1 more bushels of grain per acre than the non-users (99.5 vs. 90.4). This difference in yield between users and non-users of this practice was significant at the .05 level. Thus, use of liming according to soil test recommendations was significantly related to corn yield in 1979.

Fertilized According to Soil Test Recommendations

Results regarding corn yield and the practice "Fertilized according to soil test recommendations" indicated that producers who used this practice in 1979 had an average yield of 7.4 more bushels of grain per acre than the non-users (98.5 vs. 91.1). This difference in yield between users and non-users of this practice was significant at the .05 level. Thus, the use of fertilizing according to soil test recommendations was significantly related to corn yield in 1979.

Mixed Fertilizer Applied According to Recommendations

Findings regarding corn yield and the practice "Mixed fertilizer applied according to recommendations" indicated that producers who used this practice in 1979 had an average yield of 2.2 more bushels of grain per acre than the non-users (94.8 vs. 92.6). This difference in yield between users and non-users of this practice was not significant at the .05 level. Thus, the use of mixed fertilizer applied according to recommendations did not make a significant difference in corn yield in 1979.

Nitrogen Fertilizer Applied According to Recommendations

Findings regarding corn yield and the practice "Nitrogen fertilizer applied according to recommendations" indicated that producers who used this practice in 1979 had an average yield of 10.5 more bushels of grain per acre than the non-users (95.8 vs. 85.3). This difference in yield between users and non-users of this practice was significant at the .05 level. Thus, the use of nitrogen fertilizer applied according to recommendations was significantly related to corn yield in 1979.

Recommended Weed Control Methods Used

Data regarding corn yield and the practice "Recommended weed control methods used" indicated that producers who used this practice in 1979 had an average yield of 14.6 more bushels of grain per acre than the non-users (96.2 vs. 81.6). This difference in yield between users and non-users of this practice was significant at the .05 level. Thus, the use of recommended weed control methods was significantly related to corn yield in 1979.

IV. RELATIONSHIP BETWEEN CORN SILAGE YIELD AND USE OF RECOMMENDED CORN PRODUCTION PRACTICES

Findings are presented in this section regarding corn silage yield per acre and the producers' use of each of 10 recommended corn production practices during the year 1979. Corn producers were classified as either users or non-users of each practice. The mean tons of corn produced per acre harvested were computed for users and non-users of each practice. One-way analysis of variance was used to determine the significance of observed differences.

Planted Recommended Variety

Data presented in Table III regarding corn silage, yield and the practice "Planted U.T. recommended corn varieties" indicated that producers who used this practice in 1979 had an average yield of 2.2 more tons per acre than the non-users (18.1 vs. 15.9). This difference in yield between users and non-users of this practice was significant at the .05 level. Thus, producers who used recommended varieties had a significantly higher silage yield in 1979.

Planted During the Recommended Season

Results regarding corn silage yield and the practice of "Planting during recommended season" indicated that producers who used this practice in 1979 had an average yield of 1.4 more tons per acre than the non-users (18.2 vs. 16.8). This difference in yield between users and non-users of this practice was significant at the .05 level. Thus, producers who used recommended varieties had a significantly higher silage yield in 1979.

Planted For Recommended Stand of Corn Plants Per Acre

Findings regarding corn silage yield and the practice "Planted recommended stand of corn plants per acre" indicated that producers who used this practice in 1979 had an average yield of 1.0 more tons per acre than the non-users (18.1 vs. 17.1). This difference in yield between users and non-users of this practice was not significant at the .05 level. Thus, producers who planted recommended stand of corn plants per acre did not make significantly higher corn silage yield in 1979 than those who did not follow this practice.

Limed According to Soil Test Recommendations

Data regarding corn silage yield and the practice "Limed according to soil test recommendations" indicated that producers who used this practice in 1979 had an average yield of 0.9 more tons per acre than the non-users (18.4 vs. 17.5). This difference in yield between users and non-users of this practice was significant at the .05 level. Thus, producers who limed according to soil test recommendations made significantly higher corn silage yields in 1979 than those who did not follow this practice.

Land for Silage Fertilized According To Soil Test Recommendations

Findings regarding corn silage yield and the practice "Land for silage fertilized according to soil test recommendations" indicated that producers who used this practice in 1979 had an average yield of 1.0 more tons per acre than non-users (18.5 vs. 17.5). This difference in yield between users and non-users of this practice was significant at the .05 level. Thus, fertilizing land according to soil test recommendations was significantly related to corn silage yield in 1979.

Mixed Fertilizer Applied According to Recommendations

Results regarding corn silage yield and the practice "Mixed fertilizer applied according to recommendations" indicated that producers who used this practice in 1979 had an average yield of .03 less tons per acre than the non-users (17.9 vs. 18.2). This difference in yield between users and non-users of this practice was not

significant at the .05 level. Thus, the use of mixed fertilizer applied according to recommendations did not make a significant difference in corn silage yield in 1979.

Nitrogen Fertilizer Applied According To Recommendations

Data regarding corn silage yield and the practice "Nitrogen fertilizer applied according to recommendations" indicated that producers who used this practice in 1979 had an average yield of 0.8 more tons per acre than the non-users (18.1 vs. 17.3). This difference in yield between users and non-users of this practice was not significant at the .05 level. Thus, applying nitrogen fertilizer according to recommendations did not make a significant difference in corn silage yield in 1979.

Recommended Weed Control Methods Used

Findings regarding corn silage yield and the practice "Recommended weed control methods used" indicated that producers who followed this practice in 1979 had an average yield of 2.1 more tons per acre than the non-users (18.2 vs. 16.1). This difference in yield between users and non-users of this practice was significant at the .05 level. Thus, producers who used recommended weed control methods had a significantly higher yield per acre of corn silage in 1979 than those who did not follow this practice.

Silage Harvested at the Recommended Time

Findings regarding corn silage yield and the practice "Silage harvested at the recommended time" showed that producers who used

this practice in 1979 had an average yield of 0.4 more tons per acre than the non-users (18.0 vs. 17.6). This difference in yield between users and non-users of this practice was not significant at the .05 level. Thus, harvesting silage at the recommended time did not make a significant difference in corn silage yield in 1979.

V. CHARACTERISTICS OF CORN PRODUCERS USING MANAGEMENT PRACTICES AND EXTENSION CONTACTS

Table IV presents findings concerning the characteristics of corn producers' use of selected management practices and the number of contacts (i.e. Extension meetings attended, corn production meetings attended, visits to the Extension office, telephone calls to the Extension office, farm visits received) producers had over a 12-month period with Extension agents.

Relationship Between Using Management Practices And the Number of Extension Meetings Attended

The data regarding management practices used and the number of Extension meetings attended (See Table IV) showed that producers who used the practice of double cropping their corn for grain following small grains had attended a larger number of Extension meetings than non-users (2.5 vs. 2.0). Also, producers who double cropped following other crops had attended more Extension meetings than non-users (2.5 vs. 1.9). This difference in meetings attended by users and non-users of this practice was significant at the .05 level. Therefore, producers who double cropped their corn for grain following either small grains

TABLE IV

RELATIONSHIPS BETWEEN THE USE OF SELECTED SOIL MANAGEMENT PRACTICES AND EXTENSION CONTACTS

Soil Management Practice	Ext. Meetings Attended	Corn Production Meetings Attended	Visits to Ext. Office	Tele. Calls to Ext. Office	Farm Visits Received
	Mean	Mean	Mean	Mean	Mean
Corn for Grain Double Cropped Following:					
Small Grain					
No (N=1665)	2.0	0.4	2.8	4.2	3.3
Yes (N=319)	2.5	0.4	3.0	5.2	4.0
F Value	8.3	0.0	0.0	6.7	9.3
p Level	0.004	0.914	0.806	0.009	0.002
Other Crops					
No (N=1583)	1.9	0.4	2.9	4.3	3.4
Yes (N=401)	2.5	0.5	3.1	4.6	3.2
F Value	17.2	5.8	0.9	0.4	1.0
p Level	0.000	0.016	0.346	0.548	0.314
Corn for Silage Double Cropped Following:					
Small Grain					
No (N=1045)	2.0	0.4	3.1	4.5	3.6
Yes (N=939)	2.1	0.4	2.8	4.2	3.2
F Value	0.0	0.8	3.2	1.3	6.2
p Level	0.771	0.377	0.074	0.260	0.013
Other Crops					
No (N=1183)	2.1	0.4	3.1	4.7	3.7
Yes (N=801)	1.9	0.4	2.8	3.9	2.9
F Value	2.4	1.2	1.8	6.9	16.2
p Level	0.124	0.283	0.181	0.009	0.000
Corn for Grain Using Minimum Tillage					
No (N=1638)	2.0	0.4	2.9	4.2	3.3
Yes (N=346)	2.4	0.4	3.2	5.2	3.8
F Value	7.9	0.5	0.9	4.2	3.3
p Level	0.005	0.476	0.319	0.0.2	0.079

TABLE IV (continued)

Soil Management Practice	Ext. Meetings Attended	Corn Production Meetings Attended	Visits to Ext. Office	Tele. Calls to Ext. Office	Farm Visits Received
	Mean	Mean	Mean	Mean	Mean
Conventional Tillage					
No (N=278)	2.0	0.4	2.7	4.3	3.4
Yes (N=1706)	2.1	0.4	3.0	4.4	3.4
F Value	0.0	0.0	1.3	0.0	0.0
p Level	0.895	0.884	0.249	0.873	0.893
Corn for Silage Using:					
Minimum Tillage					
No (N=1117)	2.1	0.4	3.1	4.6	3.7
Yes (N=867)	1.9	0.4	2.8	4.1	3.1
F Value	2.0	0.5	1.3	3.4	11.1
p Level	0.154	0.497	0.254	0.063	0.000
Conventional Tillage					
No (N=642)	2.1	0.4	3.1	4.4	3.4
Yes (N=1342)	2.0	0.4	2.9	4.4	3.4
F Value	0.4	1.0	1.5	0.0	0.0
p Level	0.521	0.310	0.214	0.943	0.972
Corn for Grain or Silage Using:					
Planting on Contour					
No (N=904)	2.0	0.4	2.8	4.4	3.4
Yes (N=1080)	2.1	0.4	3.1	4.4	3.4
F Value	0.2	0.4	2.3	0.0	0.1
p Level	0.686	0.537	0.128	0.789	.768
Strip Cropping					
No (N=1841)	2.0	0.4	2.9	4.2	3.3
Yes (N=143)	2.6	0.7	3.8	6.4	4.3
F Value	6.2	16.9	5.6	15.9	6.8
p Level	0.013	0.000	0.018	0.000	0.009

or other crops had attended significantly more Extension meetings than those who did not use the practice.

Corn producers who double cropped their corn for silage following either small grains or other crops had attended approximately the same number of Extension meetings as the non-users. The slight difference was not significant at the .05 level. Thus, the use of this practice was not influenced significantly by the number of Extension meetings attended.

Producers who used minimum tillage in the production of corn for grain had attended a larger number of Extension meetings (2.4 vs. 2.0) than non-users. This difference in the number of Extension meetings attended was significant at the .05 level. Therefore, whether or not producers used this practice was significantly related to the number of Extension meetings producers attended. However, the use of conventional tillage among producers was not significantly related to the number of Extension meetings attended.

A comparison of producers who used minimum tillage with those who used conventional tillage in corn for silage showed that each class of producers had attended approximately the same number of Extension meetings. The slight difference was not significant at the .05 level. Thus, the use of the practice of minimum tillage was not influenced significantly by the number of Extension meetings attended.

Corn producers who planted corn for grain and those who planted corn for silage on the contour did attend slightly more Extension meetings than those who did not plant on the contour (2.1 vs. 2.0).

However, this difference was not significant at the .05 level. On the other hand, corn producers who practiced strip cropping did attend more Extension meetings than those who did not (2.6 vs. 2.0). These differences were significant. Thus, whether or not producers used strip cropping was significantly related to the number of meetings producers attended.

Relationship Between Using Management Practices and The Number of Corn Production Meetings Attended

Findings regarding management practices used and the number of corn production meetings attended showed that producers who used the practice of double cropping their corn for grain following small grains had attended the same number of meetings as non-users. Therefore, use of the practice was not influenced by the number of corn production meetings attended. However, producers who double cropped following other crops had attended a larger number of Extension corn production meetings than non-users (0.5 vs. 0.4). This difference in the number of corn production meetings attended by users and non-users of double cropping was significant. Thus, producers who double cropped their corn for grain following other crops attended significantly more production meetings than those who did not use this practice.

Corn producers who double cropped their corn for silage following either small grains or other crops had attended the same number of corn production meetings as non-users. Thus, the use of the practice was not influenced by the number of production meetings attended. Also, producers who used the practice of minimum tillage of corn for

grain had attended the same number of corn production meetings as those producers who used conventional tillage. Therefore, use of minimum tillage was not significantly related to the number of corn production meetings attended.

Corn producers who used minimum tillage in corn for silage had attended the same number of production meetings as those producers who used conventional tillage. Thus, use of the practice was not related to the number of production meetings attended.

Corn producers who planted on contour their corn for grain or silage did not attend more corn production meetings than non-users. However, producers who practiced strip cropping attended more corn production meetings than non-users (0.7 vs. 0.4). The use of strip cropping was significantly related to the number of production meetings producers attended.

Relationship Between Using Management Practices and the Number of Visits to Extension Office

Comparison of corn producers as to the use of recommended management practices and the number of visits they made to the Extension office showed that producers who double cropped corn for grain following either small grains or other crops did make more visits to the Extension office than non-users. However, the difference in the number of visits to the Extension office by users and non-users was not significant at the .05 level. Therefore, use of the practice was not significantly influenced by the number of visits made to the Extension office.

Corn producers who double cropped their corn for silage following either small grains or other crops made fewer visits to the Extension office; however, the difference was not significant. Thus, the use of double cropping following small grains or other crops was not significantly influenced by the number of visits producers made to the Extension office.

Producers who used minimum tillage of corn for grain made more visits to the Extension office than non-users (3.2 vs. 2.9). Also, producers who used conventional tillage in corn for grain made more visits to the Extension office than did non-users (3.0 vs. 2.7). However, differences in the number of visits made by users and non-users of these practices were not significant at the .05 level. Therefore, use of minimum tillage or conventional tillage practices was not significantly influenced by the number of visits producers made to the Extension office.

Producers who used minimum tillage in corn for silage made fewer visits to the Extension office than those who did not (2.8 vs. 3.1). Also, producers who used conventional tillage made fewer visits than non-users (2.9 vs. 3.1). However, these differences in the number of visits made to the Extension office was not significant. Thus, the use of minimum tillage or conventional tillage was not influenced significantly by the number of visits made to the Extension office.

Producers who planted corn on the contour did make more visits to the Extension office than those who did not contour (3.1 vs. 2.8). However, this difference was not significant. On the other hand, corn producers who practiced strip cropping made significantly more

visits to the Extension office than those who did not use strip cropping. Therefore, whether or not producers used strip cropping was significantly influenced by the number of visits made to the Extension office.

Relationship Between Using Management Practices and the Number of Telephone Calls to the Extension Office

Findings concerning the use of management practices and the number of telephone calls corn producers made to the Extension office showed than those who used double cropping in their corn for grain following small grains did make significantly more telephone calls to the Extension office than those who did not double crop (5.2 vs. 4.2). However, producers who used double cropping following other crops did not make significantly more phone calls than non-users (4.6 vs. 4.3).

Producers who double cropped their corn for silage following small grains or other crops made fewer telephone calls to the Extension office than non-users. However, the differences were significant in other crops at the .05 level. Therefore, the use of the practice of double cropping following other crops was significantly related to the number of telephone calls made to the Extension office.

Corn producers who used minimum tillage in corn for grain made significantly more telephone calls to the Extension office than non-users (5.2 vs. 4.2). The use of conventional tillage was not significantly related to the number of telephone calls producers made to the Extension office.

Comparison of producers using minimum and those using conventional tillage in corn for silage showed that those who used these practices

made the same or fewer telephone calls to the Extension office than the non-users. Thus, the use of conventional tillage was not significantly influenced by the number of telephone calls made to the Extension office.

Corn producers who planted on contour their corn for grain or silage made the same number of telephone calls to the Extension office. However, producers who practiced strip cropping made significantly more phone calls to the Extension office than did non-users (6.4 vs. 4.2). Thus, the use of strip cropping was significantly related to the number of telephone calls made to the Extension office.

Relationships Between Using Management Practices And the Number of Farm Visits Received

Findings showed that producers who used double cropping following small grains in corn for grain received significantly more farm visits from Extension agents than non-users (4.0 vs. 3.3). Producers who double cropped following other crops received slightly less farm visits. However, the difference was not significant.

A comparison of producers who did and those who did not double crop corn for silage following small grains indicated that those who double cropped received fewer farm visits than those who did not use this practice. The difference was significant at the .05 level. Also, producers who used double cropping following other crops received significantly fewer farm visits. Therefore, the use of the practice of double cropping corn for silage following the small grains or other crops was significantly related to the number of farm visits

received. However, producers who were not double cropping received a larger number of farm visits from Extension agents than did those who were using this practice.

Comparison of data concerning corn producers who used minimum or conventional tillage in corn for grain received the same or more farm visits. However, the difference in the number of farm visits received was not significant. Therefore, the use of neither minimum tillage or conventional tillage was not significantly related to the number of farm visits received.

Producers who used minimum tillage in corn for silage received less farm visits than non-users (3.1 vs. 3.7). This difference is significant at the .05 level. Thus, the use of the practice was related to the number of farm visits received. Producers using conventional tillage received the same number of visits as non-users. Therefore, the use of conventional tillage was not significantly related to the number of farm visits received.

Producers who planted corn for grain or silage on contour received the same number of visits as non-users. Therefore, the relationship was not significant. However, corn producers who practiced strip cropping received significantly more farm visits than non-users (4.3 vs. 3.3).

Summary

The data in the table revealed that the use of soil managment practices was associated with the number of contacts with Extension. However, strip cropping was the only practice related to all five types of Extension contacts (i.e. Extension meetings attended, corn production

meetings attended, telephone calls made to the Extension office, farm visits received from Extension agents, visits to the Extension office). Thus, producers who used this practice had more contacts than producers who were not using the practice.

Use of the practices regarding conventional tillage and planting on contour was not significantly related to any type of Extension contact.

VI. RELATIONSHIP BETWEEN THE NUMBER OF CONTACTS PRODUCERS HAD WITH EXTENSION AGENTS OVER A 12-MONTH PERIOD AND PRODUCERS' USE OF RECOMMENDED CORN PRODUCTION PRACTICES IN 1979

Findings regarding the relationship between the number of contacts corn producers had with Extension agents over a 12-month period and producers' use of ten recommended corn production practices in 1979 are presented in Table V. Five contact methods were studied.

Planted Recommended Corn Variety

Table V shows that on the average, corn producers who planted corn varieties in 1979 attended 2.1 Extension meetings; .4 corn production meetings; made 3.0 visits to the Extension office; made 4.5 telephone calls to the Extension office; and received 3.4 farm visits from Extension agents. Conversely, producers who did not plant recommended varieties attended an average of 1.7 Extension meetings; 0.4 corn production meetings; made 2.8 visits and 3.5 telephone calls to the Extension office; and received 3.5 farm visits from Extension agents.

When the data for those who were using a recommended variety were compared to non-users, the users made more total contacts with Extension.

TABLE V

RELATIONSHIP BETWEEN NUMBER OF CONTACTS CORN PRODUCERS HAD WITH EXTENSION AGENTS OVER A 12-MONTH PERIOD AND PRODUCERS' USE OF RECOMMENDED CORN PRODUCTION PRACTICES IN 1979

Recommended Corn Production Practice	Ext. Meetings Attended	Corn Production Meetings Attended	Visits to Ext. Office	Tele. Calls to Ext. Office	Farm Visits Received
	Mean	Mean	Mean	Mean	Mean
Planted Recommended Variety					
No (N=138)	1.7	.4	2.8	3.5	3.5
Yes (N=1754)	2.1	.4	3.0	4.5	3.4
F Value	2.2	0.2	0.2	3.1	0.1
p Level	0.136	0.677	0.657	0.080	0.760
Planted at Recommended Time					
No (N=269)	2.1	.4	3.3	4.6	3.3
Yes (N=1680)	2.0	.4	2.9	4.4	3.4
F Value	0.6	0.1	2.3	0.4	0.2
p Level	0.454	0.716	0.132	0.552	0.653
Planted Recommended Plant Population					
No (N=242)	1.6	.3	2.4	3.4	2.5
Yes (N=1647)	2.1	.4	3.1	4.6	3.6
F Value	9.2	10.7	5.5	7.0	15.7
p Level	0.003	0.001	0.019	0.008	0.000
Limed According to Soil Test					
No (N=1046)	1.5	.3	2.4	3.5	2.9
Yes (N=867)	2.5	.5	3.6	5.5	4.1
F Value	87.2	49.5	41.7	43.0	40.7
p Level	0.000	0.000	0.000	0.000	0.000
Fertilized According to Soil Test					
No (N=948)	1.6	.3	2.5	3.5	3.0
Yes (N=771)	2.5	.5	3.7	5.6	4.0
F Value	71.2	32.4	38.9	44.8	28.0
p Level	0.000	0.000	0.000	0.000	0.000

TABLE V (continued)

Recommended Corn Production Practices	Ext. Meetings Attended	Corn Production Meetings Attended	Visits to Ext. Office	Tele. Calls to Ext. Office	Farm Visits Received
	Mean	Mean	Mean	Mean	Mean
Silage Land Fertilized According to Soil Test					
No (N=372)	2.0	.4	2.9	4.2	3.8
Yes (N=382)	2.7	.5	3.4	6.3	4.5
F Value	10.7	8.7	2.8	14.5	3.8
p Level	0.001	0.003	0.094	0.000	0.051
Fertilizer Applied As Recommended					
No (N=303)	1.6	.4	2.8	4.6	3.6
Yes (N=1622)	2.1	.4	3.0	4.3	3.4
F Value	9.1	0.0	0.4	0.5	1.3
p Level	0.003	0.935	0.539	0.487	0.264
Nitrogen Applied as Recommended					
No (N=232)	1.3	.4	2.6	3.2	2.7
Yes (N=1640)	2.1	.4	3.1	4.7	3.6
F Value	18.6	0.6	2.9	10.5	9.7
p Level	0.000	0.447	0.088	0.001	0.002
Weeds Controlled by Recommended Methods					
No (N=228)	1.5	.3	2.3	2.8	2.3
Yes (N=1672)	2.1	.4	3.1	4.6	3.6
F Value	8.6	6.5	6.9	16.8	19.0
p Level	0.003	0.011	0.009	0.000	0.000
Silage Harvested at Recommended Time					
No (N=112)	2.4	.4	3.1	4.6	3.1
Yes (N=620)	2.4	.4	3.2	5.6	4.4
F Value	0.0	0.0	0.0	1.4	6.8
p Level	0.855	0.964	0.882	0.233	0.009

However, when tested by the F test of significance, the use of planting recommended corn varieties was not significantly related to any of the five Extension methods of contact.

Planted Corn at Recommended Time

Corn producers who planted at recommended time, on the average, attended 2.0 Extension meetings; 0.4 corn meetings; made 2.9 visits to the Extension office; made 4.4 telephone calls; and received 3.4 farm visits from agents. Those who did not use the practice, on the average, attended 2.1 Extension meetings; .4 corn meetings; made 3.3 visits to the Extension office; made 4.6 telephone calls; and received 3.3 farm visits from agents.

When tested for significance, the use of this practice was not significantly related to any of the methods of Extension contacts.

Planted For Recommended Plant Population

The corn producers who planted recommended number of plants per acre attended 2.1 Extension meetings; .4 corn meetings; made 3.1 visits to the office; and received 3.6 farm visits from agents. Producers who did not use the practice, on the average, attended 1.6 Extension meetings; .3 corn meetings; made 2.4 visits to the office; made 3.4 telephone calls; and received 2.5 farm visits from agents. Therefore, those who were using the practice had more Extension contacts of each type than the non-users. When tested, each of the five methods of Extension contacts was significantly greater for those who were planting the recommended plant population.

Limed According to Soil Test

Corn growers who limed according to soil test recommendations, on the average, attended 2.5 Extension meetings; .5 corn meetings; made 3.6 visits to the Extension office; made 5.5 telephone calls to the office; and received 4.1 farm visits from Extension agents. Those who did not use the practice attended 1.5 Extension meetings; .3 corn meetings; made 2.4 visits to the office; made 3.5 telephone calls to the office; and received 2.9 farm visits from agents.

Producers who used the practice had more Extension contacts than the non-users. When tested, it was shown that producers who had limed according to soil test recommendations had made significantly more contacts of each type with Extension agents than those not using this practice.

Fertilized According to Soil Test

Corn producers who fertilized according to soil test recommendations, on the average, attended 2.5 Extension meetings; .5 corn meetings; made 3.7 visits to the office; made 5.6 telephone calls to the office; and received 4.0 farm visits from agents. Those who did not use the practice attended 1.6 Extension meetings; .3 corn meetings; made 2.5 visits to the Extension office; made 3.5 telephone calls; and received 3.0 farm visits from agents. Producers who fertilized according to soil test had significantly more of each type of Extension contact than non-users.

Silage Land Fertilized by Soil Test

Producers who used the practice of fertilizing silage land by soil test attended, on the average, 2.7 Extension meetings; .5 corn meetings; made 3.4 visits to the Extension office; made 6.3 telephone calls to the office; and received 4.5 farm visits from agents. Those who did not use the practice attended 2.0 Extension meetings; .4 corn meetings; made 2.9 visits to the office; made 4.2 telephone calls to the office; and received 3.8 farm visits from Extension agents. When tested by the F test, it was shown that the number of Extension meetings, the number of corn production meetings, and the number of telephone calls were significantly related to the use of the practice. The number of visits made to the Extension office and the number of farm visits received were not significantly related to the use of this practice.

Fertilizer Applied as Recommended

Producers who used recommended fertilizer application, on the average, attended 2.1 Extension meetings; .4 corn meetings; made 3.0 visits to the Extension office; made 4.3 telephone calls to the office; and received 3.4 farm visits from agents. Those who did not use the practice attended 1.6 Extension meetings; .4 corn meetings; made 2.8 visits to the Extension office; made 4.6 telephone calls to the office; and received 5.6 farm visits from agents.

When the data were tested for significance, only the number of Extension meetings was significantly related to the application of fertilizer as recommended. Corn meetings attended, office visits made,

telephone calls to the office and farm visits received were not significantly related to the practice of fertilizer applied as recommended.

Nitrogen Applied as Recommended

Corn producers who used the practice of applying nitrogen as recommended attended, on the average, 2.1 Extension meetings; .4 corn meetings; made 3.1 visits to the Extension office; made 4.7 telephone calls to the Extension office; and received 3.6 farm visits from agents. Those growers who did not use the practice attended, on the average, 1.3 Extension meetings; .4 corn meetings; made 2.6 visits to the Extension office; made 3.2 phone calls to the office; and received 2.7 farm visits from agents.

Producers who used the practice had more Extension contacts than non-users. When the information was tested by the F test, it was shown that there was not a significant relationship between the number of corn meetings attended and the number of visits made to the Extension office. However, there was a significant relationship between the use of this practice and the number of Extension meetings attended, the number of phone calls made to the Extension office, and the number of farm visits reveived from agents. Thus, the producers who applied nitrogen as recommended, attended significantly more Extension meetings, made significantly more phone calls, and received significantly more visits from agents.

Weeds Controlled by Recommended Methods

Producers who were using the practice of controlling weeds according to recommended methods, on the average, attended 2.1 Extension meetings;

.4 corn meetings; made 3.1 visits to the Extension office; made 4.6 telephone calls to the office; and received 3.6 farm visits from agents. Corn producers who were not using the practice attended, on the average, 1.5 Extension meetings; .3 corn meetings; made 2.3 visits to the Extension office; made 2.8 telephone calls to the Extension office; and received 2.3 farm visits from agents.

Producers who used the practice had more Extension contacts of each type than those who did not. When the data were tested, it was shown that each of the contact methods was significantly related to the use of the practice of controlling weeds by recommended methods.

Silage Harvested at Recommended Time

Producers who were harvesting their silage at recommended stage of maturity, on the average, attended 2.4 Extension meetings; .4 corn meetings; made 3.2 visits to the Extension office; made 5.6 telephone calls to the office; and received 4.4 farm visits from agents. Corn growers who were not using the practice attended, on the average, 2.4 Extension meetings; .4 corn meetings; made 3.1 visits to the office; made 4.6 telephone calls to the office; and received 3.1 farm visits from Extension agents.

Neither the number of Extension meetings attended, corn meetings attended, the number of visits to the Extension office, or the number of telephone calls to the Extension office was significantly related to the producers' use of this practice. However, the number of visits received from Extension agents was significantly related to the use of this practice. Thus, producers who were using this practice had

received more farm visits from Extension agents than those not using this practice.

Summary: Use of Recommended Practices and Number of Extension Meetings Attended

In summary, use of the practices regarding planting recommended plant population, liming according to soil test, fertilizing according to soil test, silage land fertilized according to soil test, fertilizer applied as recommended, nitrogen applied as recommended and weeds controlled by recommended methods were significantly related to the number of Extension meetings attended. However, the producers' use of practices regarding planting recommended corn variety, planting at recommended time, and silage harvested at recommended time were not significantly related to the number of Extension meetings attended. Producers who used recommended plant population, limed, fertilized according to soil test, nitrogen and other fertilizer applied as recommended, and weeds controlled by recommended methods attended the largest number of Extension meetings.

Summary: Use of Recommended Practices and Number of Corn Production Meetings Attended

Planting recommended varieties, planting at the recommended time, fertilizer and lime applied as recommended were not significantly related to the number of corn production meetings attended. However, the producers' use of practices regarding planting recommended plant population, corn land limed and fertilized according to soil test, silage land fertilized by soil test, and weeds controlled by recommended

methods were significantly related to the number of corn production meetings attended. Findings indicated that producers who used these last-mentioned practices attended a signficantly larger number of corn production meetings than those who were not using the practices.

Summary: Use of Recommended Practices and Number of Visits to Extension Office

Planting recommended corn variety, planting at recommended time, silage land fertilized according to soil test, fertilizer applied as recommended, nitrogen applied as recommended, and silage harvested at recommended time, were not significantly related to the number of visits producers made to the Extension office. However, planting recommended plant population, limed and fertilized according to soil test, and weeds controlled by recommended methods were significantly related to the number of visits made to the Extension office by producers. Therefore, producers who used these practices made significantly more visits to the Extension office.

Summary: Use of Recommended Practices and Number of Telephone Calls Made to the Extension Office

Planting recommended varieties, planting at recommended time, fertilizer applied as recommended, and silage harvested at recommended time were not significantly related to the number of phone calls made to the Extension office. However, planting recommended plant population, corn limed and fertilized according to soil test, silage land fertilized by soil test, nitrogen applied as recommended, and weeds controlled by recommended methods were significantly related to the number of telephone calls made to the Extension office. Producers who

used these practices made significantly more phone calls to the Extension office.

Summary: Use of Recommended Practices And Number of Farm Visits Received

Use of practices regarding planting recommended varieties, planting at recommended time, silage land fertilized according to soil test, fertilizer applied as recommended, were not significantly related to the number of farm visits received from agents. However, planting recommended plant population, corn limed and fertilized according to soil test, nitrogen applied as recommended, weeds controlled by recommended methods, and silage harvested at recommended time were significantly related to the number of farm visits received from agents. Producers who used these practices received significantly more farm visits from agents than those who were not using these last mentioned practices.

VII. RELATIONSHIP BETWEEN THE YIELD PER ACRE OF CORN FOR GRAIN AND SILAGE AND THE NUMBER OF CONTACTS PRODUCERS HAD WITH EXTENSION OVER A 12-MONTH PERIOD

Table VI presents findings regarding the relationship between yield per acre of grain and of silage and the number of contacts corn producers had with Extension over a 12-month period in 1979. This section is divided into two subsections. The first subsection deals with yield of corn for grain and Extension contacts. The second subsection deals with yield of silage and Extension contacts.

TABLE VI

RELATIONSHIP BETWEEN THE YIELD PER ACRE OF CORN FOR GRAIN AND SILAGE AND THE NUMBER OF CONTACTS PRODUCERS HAD WITH EXTENSION OVER A 12-MONTH PERIOD

Type and Number Of Ext. Contact	Yield/Acre Of Grain In Bushels		Yield/Acre Of Silage In Tons	
	No. Responding	Mean	No. Responding	Mean
No. of Ext. Meetings Attended by Corn Producers				
0	586	91.6	206	18.0
1	289	94.7	119	17.2
2	333	96.2	107	17.6
3	192	94.3	71	18.2
4	124	97.4	46	19.2
5	70	100.5	28	17.6
6	60	95.2	31	19.4
7	9	99.6	4	18.4
8	29	106.3	16	22.0
9	5	89.2	1	19.6
10	18	87.6	11	13.0
12	10	100.7	9	18.1
15	3	92.0	1	19.8
18	2	125.0	1	19.0
25	1	100.0	1	18.0
Totals	1731	94.5	65.2	18.0
F Value	2.1		2.4	
p Level	0.008		0.002	
No. of Corn Production Meetings Attended By Producers				
0	1144	92.9	449	17.5
1	500	96.9	156	18.9
2	60	104.2	38	19.2
3	20	102.4	6	18.8
4	4	100.5	2	19.0
9	4	76.5	3	21.3

TABLE VI (continued)

Type and Number Of Ext. Contact	Yield/Acre Of Grain In Bushels No. Responding	Mean	Yield/Acre Of Silage In Tons No. Responding	Mean
Totals	1732	94.5	654	18.0
F Value	4.4		5.0	
p Level	0.000		0.000	
No. of Visits Made To Ext. Office By Producer				
0	465	93.6	174	17.4
1	258	93.9	98	17.8
2	306	91.7	112	17.3
3	198	97.5	71	18.1
4	136	95.2	56	18.6
5	71	96.3	21	20.1
6	127	94.6	61	18.8
7	11	105.2	6	17.3
8	30	100.7	10	17.8
9	11	100.9	2	17.0
10	34	96.6	13	19.8
12	43	97.1	15	17.2
15	13	89.0	2	22.5
16	1	130.0	1	20.0
18	3	98.0	1	18.0
20	6	90.8	3	23.0
24	3	110.3	2	19.0
25	6	97.0	4	18.8
30	1	140.0	1	25.0
Totals	1723	94.5	653	18.0
F Value	1.1		1.8	
p Level	0.305		0.016	
No. of Telephone Calls Made to Ext. Office By Producer				
0	390	89.3	112	16.7
1	169	92.0	57	16.9
2	292	96.1	100	18.0
3	183	92.8	69	18.3
4	169	97.7	70	17.9

TABLE VI (continued)

Type and Number Of Ext. Contact	Yield/Acre Of Grain In Bushels		Yield/Acre Of Silage In Tons	
	No. Responding	Mean	No. Responding	Mean
5	92	94.4	39	18.6
6	121	99.2	52	17.8
7	16	97.8	8	19.4
8	56	101.2	23	18.6
9	17	99.4	3	18.7
10	68	96.2	36	18.3
12	62	91.3	33	18.8
14	4	96.3	3	19.3
15	25	104.6	18	18.9
18	1	90.0	1	25.0
20	24	101.3	7	18.9
24	1	100.0	1	20.0
25	12	100.7	7	20.9
28	1	80.0	1	26.0
30	3	98.7	2	15.0
35	3	96.7	2	24.0
40	2	123.0	2	19.0
48	1	120.0	1	18.0
50	5	129.0	2	21.0
52	2	112.0	1	18.0
60	1	100.0	1	19.0
98	1	107.0	1	20.0
Totals	1721	94.5	652	18.0
F Value	2.3		1.6	
p Level	0.000		0.023	
No. of Farm Vists Producers Received From Ext. Agents				
0	327	90.7	94	16.9
1	302	91.1	85	17.9
2	318	94.6	119	17.2
3	204	93.9	80	18.0
4	181	98.0	66	19.2
5	87	98.1	39	18.3
6	98	100.3	47	18.0
7	17	92.0	6	16.7
8	45	102.6	30	18.7
9	14	85.6	3	14.0

TABLE VI (continued)

Type and Number Of Ext. Contact	Yield/Acre Of Grain In Bushels No. Responding	Mean	Yield/Acre Of Silage In Tons No. Responding	Mean
10	32	100.0	22	19.7
11	1	50.0	3	18.7
12	51	101.1	24	17.9
13	2	100.0	1	15.0
14	1	82.0	1	15.0
15	21	97.7	15	18.5
16	6	105.3	2	26.5
17	2	121.5	1	20.0
18	2	112.0	1	20.0
20	11	101.5	9	19.7
25	2	99.0	2	17.5
28	1	100.0	1	18.0
30	5	83.0	1	20.0
35	1	75.0	1	21.0
45	1	86.0	1	18.0
Totals	1732	94.5	654	18.0
F Value	2.3		1.9	
p Level	0.001		0.007	
Total No. of Ext. Contacts Producer Had With Agents				
1	155	87.4	33	16.3
2	58	92.4	16	18.5
3	76	89.4	25	16.4
4	88	89.7	35	16.8
5	93	92.4	30	17.2
6	73	94.4	31	16.8
7	94	93.7	32	17.8
8	81	97.7	25	17.8
9	72	93.3	21	17.5
10	71	98.5	26	17.1
11	51	96.0	20	19.1
12	67	93.8	14	17.0
13	57	95.9	27	19.6
14	55	100.8	30	18.7
15	53	95.7	16	18.0
16	48	97.3	25	18.3

TABLE VI (continued)

Type and Number Of Ext. Contact	Yield/Acre Of Grain In Bushels		Yield/Acre Of Silage In Tons	
	No. Responding	Mean	No. Responding	Mean
17	38	96.2	13	20.0
18	31	98.4	14	18.6
19	30	93.9	15	16.7
20	18	97.3	9	18.1
21	23	104.6	14	18.2
22	26	100.9	10	18.9
23	30	93.0	12	17.9
24	18	96.8	9	17.1
25	15	103.4	9	17.5
26	29	93.9	8	18.3
27	16	92.6	9	18.3
28	13	98.9	6	19.2
29	9	102.6	4	19.3
30	15	96.0	8	19.1
31	10	102.8	5	17.8
32	12	96.5	6	17.8
33	9	108.9	4	24.8
34	6	109.2	4	17.5
35	7	104.0	5	19.2
36	10	93.8	7	19.3
37	9	98.2	5	20.2
38	4	89.3	2	19.0
39	5	95.6	2	21.5
40	4	101.3	4	19.0
41	6	88.3	2	18.5
42	6	93.3	2	18.5
43	2	106.5	--	--
44	1	87.0	2	19.0
45	7	109.0	2	18.5
46	2	92.5	1	20.0
47	3	105.0	1	15.0
48	3	121.7	1	32.0
49	4	71.3	--	--
50	3	100.7	3	17.3
51	1	120.0	1	20.0
52	1	85.0	1	15.0
54	4	74.3	3	19.7

TABLE VI (continued)

Type and Number Of Ext. Contact	Yield/Acre Of Grain In Bushels		Yield/Acre Of Silage In Tons	
	No. Responding	Mean	No. Responding	Mean
57	1	98.0	--	--
58	1	105.0	1	28.0
60	3	96.7	1	25.0
61	2	130.5	--	--
62	1	81.0	--	--
63	1	87.0	--	--
64	1	133.0	--	--
65	4	85.0	1	16.0
66	2	120.0	1	20.0
67	1	120.0	1	21.0
68	3	98.0	1	18.0
69	1	80.0	--	--
71	2	86.0	--	--
72	--	--	1	15.0
74	1	116.0	--	--
Totals	1646	94.5	616	18.0
F Value	1.3		1.5	
p Level	0.085		0.011	

Extension contacts studied were Extension meetings of all kinds attended, corn production Extension meetings attended, office visits made, farm visits received, telephone calls made and total number of Extension contacts.

Relationship Between Yield of Corn For Grain and Extension Contacts

Yield per acre of grain and Extension meetings attended. Five hundred and eighty-six (586) of the producers attended no Extension meetings and harvested 91.6 bushels of corn per acre. The highest number of Extension meetings attended by any producer was 25; and this producer harvested 100 bushels per acre. The mean number of bushels for all producers was 94.5. There were 254 missing cases.

The relationship between the number of Extension meetings attended and the yield for grain in bushels per acre was significant at the .05 level. Thus, reference to the figures showed that the producers who had a low number of contacts had smaller yields and conversely, those with a high number of contacts tended to have high yields.

Yield per acre of grain and corn production meetings attended. Eleven hundred and forty-four (1,144) of the producers attended no corn production meetings and harvested 92.9 bushels of corn per acre. The highest number of corn production meetings attended by producers was nine, and these 4 producers had an average yield of 76.5 bushels per acre. Yield and/or contact data were not available from 253 of the producers.

The one-way analysis of variance F test indicated a significant relationship between the number of corn production meetings attended

and the yield for grain in bushels per acre. Reference to the contacts and yield figures indicated that producers who had a low number of contacts had smaller yields and conversely, those with a high number of contacts tended to have high yields.

Yield per acre of grain and number of visits made to the Extension office. Four hundred and sixty-five (465) of the producers made no visits to the Extension office, and these producers had an average yield of 93.6 bushels of corn per acre. The highest number of office visits made by any producer was 30, and this one producer harvested 140 bushels of corn per acre. Data were not available from 262 of the producers.

One-way analysis of variance F test indicated that the relationship between the number of Extension office visits made and the yield for grain in bushels per acre was not significant at the .05 level. However, reference to the figures seemed to indicate that producers who had a low number of contacts had smaller yields and conversely, those with a high number of contacts tended to have high yields; but the differences in yield were not significant.

Yield per acre of grain and number of telephone calls made to the Extension office. Three hundred and ninety (390) of the producers made no telephone calls to the Extension office, and they had an average yield of 89.3 bushels of corn per acre. The highest number of Extension calls reported by any producer was 98, and that producer harvested 107 bushels per acre. Data were not available from 256 of the producers surveyed.

One-way analysis of variance F test indicated a significant relationship between the number of telephone calls made to the Extension

office and the yield for grain in bushels per acre. Reference to the findings seemed to indicate that producers who had a low number of contacts had smaller yields and conversely, those with a high number of contacts tended to have high yields.

Yield per acre of grain and number of farm visits producers received from Extension agents. Three hundred and twenty-seven (327) of the producers received no farm visits from Extension agents and harvested 90.7 bushels of corn per acre. The highest number of farm visits received from Extension agents by any producer was 45, and that person harvested 86 bushels per acre. Data were not available from 245 producers.

One-way analysis of variance indicated a significant relationship between the number of farm visits made by Extension agents and the yield for grain in bushels per acre. Reference to the findings seemed to indicate that producers who had a low number of contacts had smaller yields and conversely, those with a high number of contacts tended to have high yields.

Yield per acre of grain and total number of Extension contacts made. The total number of contacts ranged from 1 to 74, and bushels per acre ranged from 87.4 to 116.0. The mean number of bushels per acre for all producers was 94.5. There were 339 missing cases.

One-way analysis of variance indicated that the relationship between the total number of contacts producers had with Extension and the yield for grain in bushels per acre was not significant at the .05 level. However, the findings suggested that the more contacts producers had with Extension, the higher their yield per acre.

Relationship Between Yield Per Acre of Silage in Tons and Extension Contacts

Yield per acre of silage and Extension meetings attended. Two hundred and six (206) of the producers attended no Extension meetings and harvested 18 tons of silage per acre. The highest number of Extension meetings attended by producers was 25, and they harvested 18 tons per acre. The mean yield for all producers was 18 tons per acre. There were 254 missing cases.

One-way analysis of variance indicated a significant relationship between the number of Extension meetings attended and the yield per acre of silage. Reference to the findings showed that producers who had a low number of contacts had lower yields and conversely, those with a high number of contacts tended to have high yields.

Yield per acre of silage and corn production meetings. Four hundred and forty-nine (449) of the producers attended no corn production meetings and on the average, they harvested 17.5 tons of silage per acre. The highest number of corn production meetings attended by producers was 9, and these nine producers averaged 21.3 tons per acre. Data were not available from 253 of the producers.

One-way analysis of variance indicated a significant relationship between the number of corn production meetings attended and the yield per acre of silage. Reference to the findings indicated that producers who had a low number of contacts had smaller yields and conversely, those with a high number of contacts tended to have high yields.

Yield per acre of silage and number of visits made to the Extension office. One hundred and seventy-four (174) of the producers made

no visits to the Extension office; and on the average, they harvested 17.4 tons of silage per acre. The highest number of office visits made by any producer was 30, and that one producer harvested 25 tons per acre. Data were missing for 262 of the producers.

One-way analysis of variance indicated a significant relationship between the number of Extension office visits made by the producer and the yield for silage in tons per acre. Reference to the findings indicated that producers who had a low number of contacts had smaller yields and conversely, those with a high number of contacts tended to have high yields.

Yield per acre of silage and number of telephone calls made to the Extension office. One hundred and twelve (112) of the producers made no telephone calls to the Extension office; and on the average, they harvested 16.7 tons of silage per acre. The highest number of Extension calls made by any producer was 98, and that one producer harvested 20 tons per acre. Data were not available from 265 of the producers.

One-way analysis of variance indicated a significant relationship between the number of telephone calls made to the Extension office by the producer and the yield for silage in tons per acre. Reference to the findings indicated that producers who had a low number of contacts had smaller yields and conversely, those with a high number of contacts tended to have high yields.

Yields per acre of silage and number of farm visits producers received from Extension agents. Ninety-four (94) of the producers

received no farm visits from Extension agents; and on the average, they harvested 16.9 tons of silage per acre. The highest number of farm visits made by Extension agents to any producer was 45, and that one producer harvested 18 tons per acre. Data were not available from 245 of the producers.

One-way analysis of variance indicated a significant relationship between the number of farm visits made by Extension agents to producers and the yield for silage in tons per acre. Reference to the findings indicated that producers who had a low number of contacts had smaller yields and conversely, those with a high number of contacts tended to have high yields.

Yield per acre of silage and total number of Extension contacts. The total number of contacts ranged from one contact to 72 contacts, and tons per acre ranged from 16.3 to 15.0. The mean number of tons per acre for all contacts was 18. There were 339 missing cases.

One-way analysis of variance indicated a significant relationship between the total number of contacts producers had with Extension agents and the yield per acre of silage. Findings indicated that the more contacts producers had with Extension, the higher was their yield per acre.

VIII. CHARACTERISTICS OF CORN PRODUCERS AND THEIR FARM OPERATIONS AND USE OF SOIL MANAGEMENT PRACTICES

Findings regarding characteristics of corn producers and their farm operations and use of soil management practices are presented in Table VII. Five variables are used to characterize the producers as to their use of soil management practices and their total number of acres

TABLE VII

RELATIONSHIPS BETWEEN THE TOTAL ACRES OF CORN HARVESTED FOR GRAIN AND THE PRODUCERS' USE OF SOIL MANAGEMENT PRACTICES

	Total Acres Corn for Grain					
	Users		Non-Users			
Soil Management Practices	No. Resp.	Mean Acres	No. Resp.	Mean Acres	F Value	p Level
Corn For Grain Double Cropped Following:						
Small Grain	319	333	1666	146	5.3	0.02
Other Crop	401	226	1584	164	0.7	0.41
Corn For Silage Double Cropped Following:						
Small Grain	939	163	1046	189	0.2	0.66
Other Crop	801	209	1184	154	0.8	0.37
Corn For Grain Using:						
Minimum Tillage	346	451	1639	118	17.8	0.00
Conventional Tillage	1707	195	278	65	2.3	0.13
Corn For Silage Using:						
Minimum Tillage	867	194	1118	163	0.3	0.60
Conventional Tillage	1343	223	642	79	5.0	0.03
Corn For Grain or Silage Using:						
Planting on Contour	1081	143	904	216	1.5	0.22
Strip Cropping	144	259	1841	170	0.6	0.44

corn harvested for grain. One-way analysis of variance was used to determine the significance of observed differences in total number of acres of corn grown for grain among users or non-users of each soil management practice.

Corn for Grain Double Cropped

Data in Table VII compares users and non-users of the practice of double cropping corn for grain following small grains as to mean average of corn harvested for grain. Producers using this practice tended to harvest more total acres of corn for grain than those not double cropping (333 vs. 146). This difference in total acres harvested between users and non-users was significant at the .05 level. Thus, producers who used the practice of double cropping corn for grain following small grains harvested significantly more acres of corn than those who did not double crop.

With the practice of double cropping corn for grain following other crops, producers who used this practice also harvested more total acres of corn for grain (226 vs. 164). However, this difference was not significant at the .05 level.

Corn for Silage Double Cropped

Producers who used the practice of double cropping corn for silage following small grains tended to harvest fewer total number of acres of corn for grain than those who did not use this practice (163 vs. 189). However, the differences were not significant at the .05 level. Producers who used the same practice following other crops tended to harvest more total acres than the non-users. However, the difference

in total acres harvested for grain between users and non-users of this practice was not significant. Therefore, total number of acres harvested did not make a significant difference in whether or not the practice was used by the producer.

Corn for Grain Using Minimum or Conventional Tillage

A comparison of users and non-users of the practice of using minimum tillage in corn for grain showed that producers who harvested more total acres of corn tended to use this practice (451 vs. 118). This difference in total acres of corn was significant at the .05 level. Thus, producers who were using minimum tillage harvested significantly more total acres of corn for grain than those who did not use minimum tillage.

A comparison of the total acres of grain harvested by the users and non-users of the practice of using conventional tillage showed that the users of this practice harvested more acres of grain (195 vs. 65). However, the difference in total acres harvested was not significant at the .05 level. Therefore, whether or not producers used this practice did not make a significant difference in the total number of acres harvested.

Corn for Silage Using Minimum Or Conventional Tillage

Data here shows that producers who used the practice of minimum tillage in corn for silage tended to harvest more total acres of corn for grain than the non-users (194 vs. 163). However, the difference

was not significant at the .05 level. Thus, total number of acres harvested was not significantly related to use of this practice.

Producers who used conventional tillage of corn for silage harvested more total acres of corn for grain than non-users (223 vs. 79). The difference in total acres harvested by users and non-users was significant at the .05 level. Therefore, producers who used conventional tillage harvested significantly more total acres of corn for grain than those who were not using conventional tillage methods.

Corn for Grain or Silage Using
Contour or Strip Cropping

A comparison of the total acres of corn harvested for grain as to users and non-users of the practice of planting on contour showed that producers who used the practice harvested fewer total acres of corn for grain (143 vs. 216). However, this difference in the number of acres harvested was not significant. Thus, total number of acres harvested was not related to planting corn on the contour.

Comparison of the total acres of corn harvested for grain by users and non-users of the practice of strip cropping showed that users harvested more total acres (259 vs. 170). However, the difference in total acres harvested by users and non-users was not significant at the .05 level. Thus, total number of acres of corn harvested was not significantly related to the use of strip cropping.

CHAPTER IV

SUMMARY OF MAJOR FINDINGS

This study was directed toward helping the Tennessee Agricultural Extension Service evaluate the extent to which its educational efforts with corn producers was effective in helping to bring about the adoption of ten recommended corn production practices.

I. PURPOSE AND SPECIFIC OBJECTIVES

Purpose

The purpose of this study was to characterize corn producers and their farm operations as to their use of recommended production practices, corn yields per acre and their contacts with Extension agents and to determine the relationships among these variables.

Specific Objectives

The specific objectives of this study were:

1. To characterize Tennessee's corn producers and their farm operations.

2. To determine the relationship between the total number of ten recommended corn production practices used by producers and yield per acre of corn harvested for grain and silage.

3. To determine the relationship between the producer's use of each of the ten recommended practices and yield per acre of corn harvested for grain and silage.

4. To determine the relationship between the characteristics of corn producers and their farm operations and the number of contacts producers had with Extension agents.

5. To determine the relationship between the use of ten recommended corn production practices and the number of contacts producers had with Extension agents.

6. To determine the relationship between the number of contacts producers had with Extension agents and the yield per acre of corn for grain and for silage.

7. To determine the relationship between the producers' use of soil management practices and the total acres of corn harvested.

II. PROCEDURES

Population and Data Collection

The population of this study included corn producers in Tennessee. The data for this study were obtained in personal interviews with corn producers using survey schedules developed by Extension Specialists at The University of Tennessee. County Extension agents in each county conducted personal interviews with randomly selected corn producers in the fall of 1979. Each agent was instructed to use the Nth number technique to randomly select 30 corn producers. A total of 1,985 corn producers were surveyed.

Method of Analysis

Data on the situation of corn producers in 1979 were coded, and computer cards were punched. Computations for statistical analysis

were made by The University of Tennessee Computer Center. Frequencies and means were used to describe the corn producers and their farming operations. One-way analysis of variance was used to analyze relationships between variables. F-values achieving the .05 level were accepted as being statistically significant.

III. MAJOR FINDINGS

Characteristics of Corn Producers in 1979

1. The mean number of acres of yellow corn harvested was 65.3.
2. Almost 50 percent raised 30 acres or less of yellow corn.
3. The mean number of acres of white corn harvested was 58.7.
4. Almost 50 percent harvested less than 20 acres of white corn.
5. The mean number of acres of silage harvested was 48.
6. Almost 50 percent harvested 30 acres or less of silage.
7. The average bushels of grain harvested per acre was 94.5.
8. The average tons of silage harvested per acre was 18.

Relationship Between the Yield/Acre of Corn for Grain and Corn for Silage and the Total Number of Recommended Corn Production Practices Used

1. The 517 producers who were using less than 6 of the 10 recommended practices had an average yield of 82 bushels of corn per acre. Whereas, the 1,216 remaining producers were using 6 or more of the recommended practices and had an average yield of just over 100 bushels of grain per acre.
2. Yield per acre of grain harvested was significantly related to the number of corn production practices used.

3. Corn silage producers who were using less than 6 of the 10 recommended practices had an average yield of almost 16 tons per acre. Whereas, those using 6 or more of the practices had an average per acre yield of 18.2 tons.
4. Yield per acre of corn silage harvested was significantly related to the number of recommended corn production practices used.

Relationship Between Corn Yield/Acre and Use Of Recommended Corn Production Practices By Grain and Silage Producers

1. Producers who were using the following practices had significantly higher yields per acre of corn harvested for grain than those who were not using these practices:
   a. Planted recommended variety.
   b. Planted during the recommended season.
   c. Planted recommended number of plants per acre.
   d. Limed according to soil test recommendations.
   e. Fertilized according to soil test.
   f. Applied nitrogen fertilizer according to recommendations.
   g. Controlled weeds according to recommended methods.
2. Yield of corn grain per acre in bushels in 1979 was not significantly related to whether or not producers applied mixed fertilizers according to recommendations.
3. Yield per acre of corn silage in tons in 1979 was signficantly related to the producers' use of 5 of the 10 recommended corn production practices. Producers who used the following

recommended practices harvested significantly more tons per acre than did those who were not using the practices:

a. Planted recommended variety.

b. Planted during recommended season.

c. Limed according to soil test recommendations.

d. Fertilized according to soil test.

e. Controlled weeds.

4. Yield of corn silage in 1979 was not significantly related to whether or not producers were using each of the following practices:

a. Planted recommended number of plants per acre.

b. Applied mixed fertilizer according to recommendations.

c. Applied nitrogen fertilizer according to recommendations.

d. Harvested silage at recommended time.

Use of Soil Management Practices
And Extension Contacts

1. The use of soil management practices was associated with the number of contacts producers had with Extension. However, only one of the practices was related to all 5 types of Extension contacts. The practice of corn for grain or silage using strip cropping was significantly related to all 5 methods of Extension contacts. Thus, producers who used this practice had more total contacts with Extension than producers who were not using the practice.

2. The producers' use of double cropping their corn for grain following small grain was significantly related to the number

of Extension meetings attended, the number of telephone calls made to the Extension office and the number of farm visits received from Extension agents. The use of the practice was not related to other contact methods. Double cropping following other crops was significantly related to the number of Extension meetings attended. The number of visits to the Extension office, the number of telephone calls made to the Extension office and the number of farm visits received from Extension agents was not related to the use of double cropping.

3. The practice of corn for silage double cropped following small grain was significantly related to only one contact method, the number of farm visits received from Extension agents. Double cropping following other crops was significantly related to the number of telephone calls made to the Extension office and the number of farm visits received from Extension agents.
4. Producers' use of the practice of corn for grain using minimum tillage was significantly related to the number of Extension meetings attended and the number of telephone calls made to the Extension office. The use of the practice was not related to other contact methods.
5. The practice of corn for silage using minimum tillage was related to the number of farm visits received from Extension agents. The practice was not related to the number of

Extension meetings attended, the number of corn production meetings attended, the number of visits to the Extension office or the number of telephone calls made to the Extension office.

6. The practices corn for grain or silage using conventional tillage and planting on contour were not significantly related to any type of Extension contact.

Relationship Between Number of Contacts Producers Had With Extension Over a 12-Month Period and Producers' Use of Recommended Corn Production Practices in 1979

1. The practice of planting a recommended variety was not significantly related to any of the 5 methods of Extension contacts.
2. Producers' use of the practice planting at recommended time was not significantly related to any of the 5 methods of Extension contacts.
3. The practice of planting recommended plant population was significantly related to all 5 methods of Extension contacts. Therefore, producers who used this practice made more contacts with Extension than those who did not.
4. Producers' use of the practice of liming according to soil test recommendations was significantly related to all 5 methods of Extension contacts. Producers who used this practice made more contacts with Extension than those who did not.
5. The practice of fertilizing according to soil test recommendations was significantly related to all 5 methods of

Extension contacts. Therefore, producers who used this practice made more contacts with Extension than producers who did not.

6. Producers' use of the practice silage land fertilized according to soil test recommendations was significantly related to the number of Extension meetings attended, the number of corn production meetings attended and the number of telephone calls made to the Extension office. Producers who used this practice made more contacts with Extension than those who did not.
7. The practice of fertilizer being applied as recommended was not significantly related to the number of corn production meetings attended, the number of visits to the Extension office, the number of telephone calls made to the Extension office and the number of farm visits received from Extension agents.
8. Growers' use of the practice of nitrogen being applied as recommended was significantly related to the number of Extension meetings attended, the number of telephone calls made to the Extension office and the number of farm visits received from Extension agents. The practice was not related to the number of corn production meetings attended and the number of visits made to the Extension office.
9. Producers' use of the practice of weeds controlled by recommended methods was significantly related to all 5 methods of

Extension contacts. Therefore, producers who used this practice made more contacts with Extension than those who did not.

10. The practice of silage harvested at the recommended time was not significantly related to the number of Extension meetings attended, the number of corn production meetings attended, the number of visits made to the Extension office and the number of telephone calls made to the Extension office. It was, however, related to the number of farm visits received.

Relationship Between the Yield Per Acre of Corn for Grain and Silage and the Number Of Contacts Producers Had With Extension

1. Extension Meetings.

   The yield per acre of both corn for grain and corn for silage was significantly related to the number of Extension meetings attended by producers in 1979. Yield per acre of corn for grain and for silage increased as the number of meetings attended also increased.

2. Corn Production Meetings.

   Yields per acre of corn for grain and for silage was significantly related to the number of corn meetings attended by producers. Yields increased as the number of corn production meetings attended also increased.

3. Visits Made to Extension Office.

   Yield per acre of corn grown for grain was not significantly related to the number of visits made by producers to the Extension office. Yield per acre of silage grown, however, was

significantly related to the number of visits producers made to the Extension office.

4. Telephone Calls to Extension Office.

   The yields per acre of corn for grain and for silage was significantly related to the number of telephone calls producers made to the Extension office.

5. Farm Visits Received.

   The yield per acre of corn for grain and for silage was significantly related to the number of farm visits producers received from agents.

6. Total Number of Contacts.

   Yield per acre of corn for grain was not significantly related to the total number of contacts producers had with Extension agents. However, yield per acre of corn for silage was significantly related to the total number of contacts producers had with Extension. Producers who had larger acreages of corn silage reported more contacts than those having fewer acres.

Relationship Between the Total Acres of Corn Harvested for Grain and the Producers' Use of Soil Management Practices

1. Acres of corn harvested was significantly related to the producers' use of the following 3 soil management practices.

   a. Double cropped corn for grain following small grains.

   b. Used minimum tillage to produce corn for grain.

   c. Used conventional tillage to produce corn silage.

Producers who used the above practices tended to harvest significantly more total acres of corn than those who did not use the practices.

2. Acres of corn harvested was not significantly related to the producers' use of the following soil management practices:
   a. Double cropped corn for grain following other crops.
   b. Double cropped corn for silage following small grains.
   c. Double cropped corn for silage following other crops.
   d. Used conventional tillage to produce corn for grain.
   e. Used minimum tillage to produce corn silage.
   f. Planted corn on the contour.
   g. Used strip cropping.

IV. IMPLICATIONS

The results of this study suggest that the staff of The University of Tennessee Agricultural Extension Service did help to influence the adoption of corn production practices. A large number of contacts with corn producers were made through Extension meetings, office visits, telephone calls, and farm visits. Those producers who frequently contacted the Extension agents were using most of the recommended corn production practices. Also, producers who had large acreages of corn were using more practices than the small producer.

With regard to the use of soil management practices, producers who used strip cropping had more contacts with Extension. Also, producers who made more frequent contacts with Extension had significantly

higer yields for both corn for grain and for silage than those who had fewer contacts. Thus, it would seem important that the Extension Service continue to serve all corn producers as effectively and efficiently as possible. Possibly even more important, however, agents should place higher priority on reaching those producers who are hesitant to contact the Extension Service.

The data in this study showed that some of the relationships between the use of recommended production practices and Extension contacts were not significant at the .05 level of probability simply because most of the producers already were using these practices. Thus, it would seem that agents spend less time on adoption of older recommended practices with the exception of weed control, liming and fertilizing according to soil test and recommended plant population.

V. RECOMMENDATIONS FOR FURTHER STUDIES

1. A similar study should be conducted over a period of years in Tennessee counties to determine which teaching methods are the most effective in the producers' adoption of new corn production practices.

2. Similar studies should be conducted in Tennessee to determine why producers did not adopt the recommended practices put forth by The University of Tennessee and to determine the farmers' confidence and satisfaction with Extension efforts.

3. Similar studies should be conducted in Tennessee to determine the effects of Extension teaching upon only the new recommended production practices; not the old ones that have been recommended for some time.

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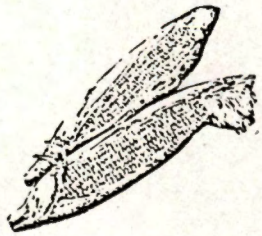
APPENDIX



TENNESSEE AGRICULTURAL
EXTENSION SERVICE

1979 Corn Production Survey

See Instructions on Last Page



1 (1) Card Number #1

Name of Respondent _____ Address _____

(2) (3) (4) County _____ Date _____

0 (5) 0 (6) Respondent Number (Leave blank)

Part "A" - GENERAL INFORMATION

1. How many acres of corn did you harvest in 1979?:*

   a. For grain:

      1. Yellow corn (actual acres harvested) (7) (8) (9) (10)

      2. White corn (actual acres harvested) (11) (12) (13) (14)

   b. For silage (actual acres harvested)? (15) (16) (17) (18)

2. What was your average yield per acre of corn harvested in 1979?

   a. Bushels per acre of corn harvested for grain (actual bushels per acre) (19) (20) (21)

   b. Tons of corn silage per acre harvested (actual tons per acre) (22) (23)

3. What percent of your 1979 corn crop was grown on:

   a. Bottomland? (Actual percent) (24) (25) (26)

   b. Side slopes (hill sides)? (Actual percent) (27) (28) (29)

   c. Level upland (Less than 2% slope)? (Actual percent) (30) (31) (32)

*Coding Instructions

1. Fill each column (e.g. 0 (7) 0 (8) 4 (9) 7 (10) with a numeral and right justify.
2. A zero (0) in all columns = none (e.g. 0 (7) 0 (8) 0 (9) 0 (10))
3. A nine (9) in all columns = does not apply or do not know (e.g. 9 (7) 9 (8) 9 (9) 9 (10))

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4. What percent of your harvested acres of corn for grain was double cropped in 1979?:

   a. Corn following small grain (actual percent)

(33) (34) (35)

   b. Corn following other crops (actual percent)

(36) (37) (38)

5. What percent of your harvested acres of corn silage was double cropped in 1979?:

   a. Corn following small grain (actual percent)

(39) (40) (41)

   b. Corn following other crops (actual percent)

(42) (43) (44)

6. What percent of your 1979 harvested acres of corn for grain was grown using:

   a. Minimum tillage? (i.e. No. prepared seedbed) (actual percent)

(45) (46) (47)

   b. Conventional tillage methods? (actual percent)

(48) (49) (50)

7. What percent of your 1979 harvested acres of corn for silage was grown using:

   a. Minimum tillage? (actual percent)

(51) (52) (53)

   b. Conventional tillage methods (actual percent)

(54) (55) (56)

8. On land where your 1979 corn crop was grown using minimum tillage practices, what percent had each of the following types of mulch:

   a. Old crop? (actual percent)

(57) (58) (59)

   b. Small grain? (actual percent)

(60) (61) (62)

   c. Permanent pasture sod? (actual percent)

(63) (64) (65)

9. What percent of your 1979 harvested acres of corn (i.e. grain and/or silage) was:

   a. Planted on the contour? (actual percent)

(66) (67) (68)

   b. Strip cropped? (actual percent)

(69) (70) (71)

(1) Card #2

(2) (3) (4) County Number

(5) (6) (7) Respondent Number (Leave blank)

10. What percent of your corn crop received an insecticide?:

(8) (9) (10) a. Applied in the row at planting? (actual percent)
Which insecticide was used? a) Furadan ____Rate/Acre_____
b) Counter_____Rate/Acre_____ c) Other_____Rate/Acre_____

(11) (12) (13) b. Applied to the corn plant as a spray or granule after the corn was up and growing? (actual percent)

11. What percent of your 1979 harvested acres of corn (i.e. grain and/or silage) was:

(14) (15) (16) a. Owned (actual percent)

(17) (18) (19) b. Cash rented (actual percent)

(20) (21) (22) c. Shared (actual percent

12. What percent of your 1979 acres of corn for grain was harvested by:

(23) (24) (25) a. Picker sheller? (i.e. combine) (actual percent)

(26) (27) (28) b. Picker? (actual percent)

(29) (30) (31) c. Other? (actual percent)

13. What percent of your 1979 harvested acres of <u>corn for grain</u> did you:

(32) (33) (34) a. Store on farm (actual percent)

(35) (36) (37) b. Store off farm? (actual percent)

<u>Part "B"</u> - LEAD QUESTIONS AND RELATED PRACTICES
(See Reference List on Last Page)

1. <u>Lead Questions</u>: a) What variety or varieties of corn did you plant in 1979?_____
_____b) Is Johnson grass a problem on your corn acreage? _____Yes, _____No

(38) #1 Recommended Practice: Planted a corn variety recommended by U.T. (1 = no, 2 = yes)

2. Lead Questions: Approximately when did you plant most of your corn crop? a) Date planted corn for grain _____ b) Date planted corn for silage _____

(39) #2 Recommended Practice: Planted corn during recommended time period (1 = no, 2 = yes) - Between April 20 and June in East and Middle Tenn., between April 1 and May 1 in West Tenn. and in Southwest corn borer infested counties in Middle Tenn. and in delta area between April 1 and May 1 or earlier.

3. Lead Questions: a) What was the width of your corn rows? _____ b) How far apart in the row were your corn plants at harvest? _____

(40) #3 Recommended Practice: Had recommended number of plants (plant population) per acre at harvest in 1979. (1 = no, 2 = yes)

4. Lead Questions: a) What percent of your corn land was soil tested in 1979? _____% b) What percent of your 1978 corn land was soil tested? _____% c) What percent of your corn land was limed in 1979? _____% d) What percent of 1979 corn land was limed in 1978? _____% e) On the average, how many tons of lime did you apply per acre in 1979? _____tons. f) What percent of your 1979 corn land had been limed over the past three (3) years? _____%

(41) #4 Recommended Practice: Corn land limed according to soil test recommendations. (1 = no, 2 = yes)

5. Lead Questions: a) What percent of your 1979 acreage of corn for grain was fertilized (i.e. N. P_2O_5, K_2O) according to soil test recommendations? _____%. b) On your 1979 corn land not soil tested, what was the average pounds of nitrogen (N) _____phosphate (P_2O_5) _____ and potash (K_2O) _____applied per acre?

(42) #5 Recommended Practice: Corn land used for grain fertilized according to soil test recommendations (1 = no, 2 = yes)

6. Lead Questions: What percent of your 1979 acreage of corn for silage was fertilized (i.e. N, P_2O_5, K_2O) according to soil test recommendations? _____%. b) On your 1979 corn land not soil tested, what was the average pounds of nitrogen (N) _____, phosphate (P_2O_5) _____ and potash (K_2O) _____ applied per acre?

(43) #6 Recommended Practice: Corn land used for silage fertilized according to soil test recommendations (1 = no, 2 = yes)

7. Lead Questions: What percent of your 1979 corn land had mixed fertilizer applied: a) Broadcast _____%, b) Banded with seed _____%, c) Banded beside & below the seed level _____%

(44) #7 Recommended Practice: Mixed fertilizer containing nitrogen (N) applied away from the seed corn (i.e. beside and below the seed level) (1 = no, 2 = yes)

8. Lead Questions: What percent of the acreage grown for grain and/or silage of your 1979 corn had nitrogen applied: a) Broadcast? _____%, b) Banded at planting _____%, c) Sidedressed? _____%. What percent had nitrogen applied: d) Less than three weeks before planting? _____%, e) Three or more weeks before planting _____%, f) Topdressed or sidedressed before corn was knee-high? _____%.

(45) #8 Recommended Practice: Nitrogen applied within three weeks before planting or sidedressed before corn was knee-high. (1 = no, 2 = yes).

9. Lead Questions: a) What percent of your 1979 corn land was treated with chemicals as the only method used to control weeds? _____%, b) What percent of corn land was cultivated without chemicals to control weeds?_____%, c) What percent had both chemicals and cultivation to control weeds _____%, d) What percent had premergence chemicals applied? _____%, e) Percent post-emergence_____%, f) Percent preplant _____%, g) Which chemical(s) was used to control weeds and rate of each per acre?

	Chemical	Rate/acre
1)	_____	_____
2)	_____	_____
3)	_____	_____

(46) #9 Recommended Practice: Recommended weed control methods used. (1 = no, 2 = yes)

10. Lead Questions: What percent of your 1979 corn silage harvested in: a) The milk or roasting-ear stage?_____%, b) The dough stage _____%, c) The hard dent stage?_____%, d) At the brown mature stage? _____%

(47) #10 Recommended Practice: Corn silage harvested at the recommended stage of maturity (dough to dent stage) (1 = no, 2 = yes)

Part "C": NUMBER OF CONTACTS 1979 CORN PRODUCERS HAD WITH EXTENSION AGENTS

(48) (49) 1. How many Extension meetings of all types did you attend during the previous 12-months? (actual number)

(50) 2. How many corn production Extension meetings did you attend during the past 12-months? (actual number)

(51) (52) 3. How many visits did you make to the Extension office during the past 12-months? (actual number)

(53) (54) 4. How many telephone calls did you make to Extension agents during the past 12-months? (actual number)

(55) (56) 5. How many farm visits did you receive from Extension agents during the past 12-months? (actual number)

Part "D": REFERENCES

Practice #1 - See Current Bulletin: "Performance of Field Crop Varieties by Charles R. Graves.

Practices #2, 3, 7, 8 - See Publication 443: "More Corn Per Acre" by Joe D. Burns.

Practices #4, 5, 6 - See Current Mimeograph publication on Fertilizer and Lime Recommendations by the soil testing laboratory.

Practice #9 - See Publication 671: "Control Weeds in Corn" by Elmer Ashburn and Joe D. Burns

Practice #10 - See Extension Circular #548: "Silage Production in Tennessee" by Joe D. Burns

Part "E": GENERAL INSTRUCTIONS FOR 1979 CORN SURVEY

1. Date Due - January 15, 1980
2. Disposition - Mail all the completed survey forms to the Associate District Supervisors of Agricultural programs.
3. Counties to be surveyed - All counties in Tennessee
4. Sample size - thirty (30) producers or all corn producers if less than 30 in the county
5. Survey population - All corn producers who grew at least 10 acres of corn for grain or for silage
6. Sampling procedure - a) Use an up-to-date listing of all corn producers who grew at least ten acres of corn in 1979, b) Use the Nth number technique to identify 35 corn producers. The last five (5) producers identified will serve as alternates. Alternates should only be used to replace those producers selected but for good reasons cannot be interviewed.

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VITA

Ronald Buford Johnson was born in Putnam County, Tennessee, on a 150-acre farm on June 5, 1952. He is the son of Buford and Mattie Johnson. He attended public shcools in Putnam County, where he was active in 4-H and FFA activities. Upon graduation, he attended Tennesee Technological University in Cookeville, majoring in Plant and Soil Science. In the summer of 1974, he received a Bachelor of Science Degree in Agriculture.

In the winter of 1975, he accepted the position of Assistant Extension Agent with the Agricultural Extension Service of The University of Tennessee in Overton County.

He is a member of Gamma Sigma Delta, the national honorary Agriculture Society; Phi Delta Kappa, the national professional educational fraternity; the Tennessee Association of Agriculture Agents; and The University of Tennessee Century Club.

He is married to the former Sandy Martin of Cookeville, Tennessee, and they have one son, Beau Wyatt, age eight months.