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A study of the relations of average two-year soybean yields produced to use of recommended production practices and selected characteristics of Marion County producers

William A. Hall

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To the Graduate Council:

I am submitting herewith a thesis written by William A. Hall entitled "A study of the relations of average two-year soybean yields produced to use of recommended production practices and selected characteristics of Marion County producers." I have examined the final electronic 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.

Robert S. Dotson, Major Professor

We have read this thesis and recommend its acceptance:

Cecil E. Carter Jr., Horace C. Smith

Accepted for the Council:

Carolyn R. Hodges


Vice Provost and Dean of the Graduate School

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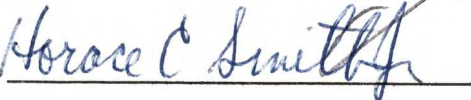
March 1, 1971

To the Graduate Council:


I am submitting herewith a thesis written by William A. Hall entitled "A Study of the Relations of Average Two-Year Soybean Yields Produced to Use of Recommended Production Practices and Selected Characteristics of Marion County Producers." I recommend that it be accepted for nine quarter hours of credit in partial fulfillment of the requirements for the degree of Master of Science, with a major in Agricultural Extension.


Major Professor

We have read this thesis
and recommend its acceptance:

Accepted for the Council:


Vice Chancellor for
Graduate Studies and Research

A STUDY OF THE RELATIONS OF AVERAGE TWO-YEAR SOYBEAN YIELDS PRODUCED
TO USE OF RECOMMENDED PRODUCTION PRACTICES AND SELECTED
CHARACTERISTICS OF MARION COUNTY PRODUCERS

A Thesis

Presented to
the Graduate Council of
The University of Tennessee

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

by

William A. Hall

March 1971

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He expresses his appreciation to Mrs. Myra Nell Stewart, Marion County Agricultural Extension secretary, and to Mrs. Barbara Kooch, clerk in the Department of Agricultural Extension Education, who so willingly cooperated in this study, and to the Extension Staff of Marion County for their faithful assistance with the Extension Program during the period of graduate study.

The computations associated with the statistical analysis for this study were done with the aid of equipment of The University of Tennessee Computing Center. This computing center was established with the aid of the National Science Foundation Grant (No. NSF-135-1).

ABSTRACT

The purposes of the study were to: (1) determine certain characteristics of Marion County soybean producers and their farms; (2) more accurately determine which recommended production practices soybean producers were using in 1968 and 1969; (3) study the relation between use of recommended production practices and yield levels; and (4) identify some of the more important factors influencing adoption of recommended soybean production practices. Thirty-eight soybean producers, which constituted both population and sample, were interviewed for the purpose of gathering data for study purposes. The data included the crop years of 1968 and 1969. Growers were categorized in above and below average yield levels, and main comparisons were made between these two groups.

Findings disclosed that soybean producers and their farms had the following characteristics: (1) had an average farm size of 430 acres; (2) had an average of 155 acres of cropland; (3) planted an average of 102 acres of soybeans; (4) had an average educational level of 9.5 grades; (5) had an average age of 47.1 years; and (6) had a median gross family income of \$14,375 (for those answering this optional question).

When the High and Low yield groups were compared it was found that the former had: (1) a larger average farm size (498 vs 365 acres); (2) more average acres of cropland (178 vs 150 acres); (3) planted fewer acres of soybeans (92 vs 114 acres); (4) a slightly higher average educational level (9.9 vs 9.2 grades); (5) a slightly lower average age (46.8 vs 47.9 years); and (6) a higher median gross family income for

those answering this optional question (\$17,499 vs \$13,333).

With regard to adoption of eleven recommended soybean production practices studied, farmers in the High yield group had slightly higher total average practice diffusion ratings than did the Low yield group. Essentially no difference was shown between the High and Low yield groups with regard to use of soybean production practices and the producers position in the diffusion process, although more of the former were liming and fertilizing according to soil test recommendations and were seeking advice from professionals.

Some reasons given to explain why soybean producers were not adopting recommended soybean production practices included: (1) lack of adequate machinery and equipment; (2) lack of technical knowledge needed; (3) relative cost of the practice and net returns per acre; (4) more rewarding activities demanded grower's time and money; and (5) belief that practices were not sound.

With regard to sources of advice about soybean production practices the growers listed (in order of frequency mentioned): neighbors and friends; seed, fertilizer, or pesticide dealers; soybean buyers; equipment dealers; Extension agents; Soil Conservation Service representative; soybean specialist; Farmers Home Administration representative; and banker or Production Credit Association representative. Additional sources of information mentioned were farm magazines, Extension distributed bulletins and publications, Extension newsletters, radio, weekly newspapers, farm meetings, commercial bulletins, daily newspapers, field days and tours, and television in that order.

It was recommended that study findings be used in the development of an Extension teaching plan for soybean producers in Marion County.

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CHAPTER I

INTRODUCTION

I. THE SITUATION AND NEED FOR THE STUDY

Marion County is located in lower (Southeast) East Tennessee. It is bordered on the south by Alabama and Georgia, on the west by Franklin County, on the north by Grundy and Sequatchie Counties, and on the east by Hamilton County. The county is divided into three distinct topographical regions--the Cumberland Plateau in the western section, the Sequatchie Valley in the middle and Waldens Ridge, Raccoon Mountain, Etna Mountain, etc., on the east. Most of the mountainous area in the eastern and western sections of the county remains in forest. Practically all of the row crop land is located in the Sequatchie Valley and the Battle Creek, Sweedens Cove and New Hope areas.

According to the 1964 United States Census of Agriculture, there were 513 farm operators in Marion County. Of these 513 farm operators, 393 (76.61 percent) were full owners. There were 92 (17.93 percent) part owners, 2 (.39 percent) managers, and 26 (5.1 percent) tenants. In 1959, there were 81 tenants or 11.9 percent of farm operators (13:290).^{*} This shows the continued change from tenancy to full ownership.

Of the 513 farm operators, only 5 (.97 percent) were non-white. Of these 5, 4 were full owners and the fifth was a part owner. These 5 harvested crops from only a total of 66 acres in 1964 (13:290).

^{*} Numbers in parentheses refer to similarly numbered items in the List of References; those after the colon refer to page numbers.

The census classified 249 farms as commercial farms in 1964 with total farm land of 47,485 acres. The average size of commercial farms was 190.7 acres. Crops were harvested from 9,610 acres on 201 commercial farms in 1964. The average size of all farms was 136.1 acres (13:300).

Total cropland in 1964 was 69,820 acres. This was a decrease from 82,854 acres in 1959. Crops were harvested from 12,136 acres on 367 farms in 1964, 7,408 fewer acres and 133 fewer farms than in 1959. This indicates a continued shift to livestock production and part-time farming. Some involvement in programs administered by the Agricultural Stabilization and Conservation Service (ASCS) also have influenced this change.

The value of all farm products sold in 1964 was \$1,686,156. Of this amount all crops accounted for \$232,670. Livestock and livestock products accounted for \$1,451,186. Poultry and poultry products (mostly broilers) accounted for \$847,720, dairy \$232,539, and livestock and livestock products other than poultry and dairy accounted for \$370,927 (13:300).

Corn and soybeans were the two principle row-crops in the county. Corn was grown on 4,276 acres in 1964, while soybeans were grown on 49 farms with 1,818 acres (13:380).

Acres reported by the Tennessee Crop Reporting Service have been somewhat at variance with those reported above. For 1964, the Tennessee Crop Reporting Service reported 4,100 acres of corn for grain and 2,000 acres of soybeans. Actually the Tennessee Crop Reporting Service had reported as high as 5,500 acres in 1966, but adjusted their

II. PURPOSES OF THE STUDY

The purposes of the study were to: (1) determine certain characteristics of Marion County soybean producers and their farms in above average and below average yield categories; (2) more accurately determine which recommended production practices the two categories of growers were using in 1968 and 1969; (3) study the relation between use of recommended production practices and yield levels; and (4) identify some of the more important factors influencing the adoption of recommended soybean production practices.

III. SOME DEFINITIONS OF TERMS

Extension agents have been called agents of change. They are interested in the adoption of innovations, whether by soybean producers or other Extension audiences.

Rogers (10:17) presents some definitions, or terminology that would seem to be appropriate for this study. For example, he says a "change agent" is a professional person who attempts to influence adoption decisions in a direction that he feels is desirable. A change agent usually seeks to secure the adoption of certain new ideas, but he also may attempt to slow the diffusion and prevent the adoption of certain other innovations.

Rogers (10:12) further suggests that the crucial considerations in an analysis of the diffusion of innovations are the innovation, its communication from one individual to another, in a social system, over time.

In clarifying the foregoing analysis, an innovation is viewed as an idea that is thought of as new by the individual. It may not be new to others in the social system, but it is the newness to the individual that determines his reaction to it.

Communication, as an element of the diffusion process, determines how the innovation spreads among the individuals who have a need for the innovation.

Rogers (10:14) views the social system as a population of individuals who are functionally differentiated and engaged in collective problem solving behavior. To relate this thinking to the present study, such a social system might consist of all the soybean producers in one county. From another point of view, Collins defines the social system, or audience, as

. . . anyone who "lends an ear" to an Extension message or "should" do so by virtue of the fact that his education or economic and social situation can stand improvement, which Extension can help him to make (2:1).

The over time element concerns the moment when a person will adopt an innovation after first hearing of it.

The adoption process is the mental process through which an individual passes from first hearing of an innovation to its final adoption. Rogers (10:17) identifies five stages of the adoption process as: awareness, interest, evaluation, trial and adoption. The adoption process is confined to the one person considering the innovation, whereas the diffusion process deals with the spread of new ideas from and between individuals.

Adoption refers to a decision to continue full use of an innovation. Discontinuance is a decision to cease use of an adoption after

previously adopting. Rejection is a decision not to adopt an innovation. Innovativeness is the degree to which an individual is relatively earlier in adopting new ideas than the other members of his social system or audience. Adopter categories compose the main headings of a classification of individuals within a social system on the basis of innovativeness. The following five adopter categories are generally recognized; innovators (among the first few to adopt), early adopters (soon after the first few to adopt), early majority (sooner than average to adopt), late majority (a little later than most to adopt), and laggards (among the last few to adopt).

CHAPTER II

REVIEW OF LITERATURE

Limited research information was available regarding adoption of recommended soybean production practices. An effort was made to review relevant literature in the study area.

Related literature reviewed for the study will be discussed under two major headings: (1) Research conducted in Tennessee, and (2) Other research. Study purposes were used to guide the presentation.

I. RELEVANT RESEARCH CONDUCTED IN TENNESSEE

No research was found regarding adoption of recommended soybean production practices by growers. Research studies of other crops in Tennessee were reviewed.

Characteristics of Growers and Their Farms

In a 1966 study, Peal (9:94) surveyed 81 cotton producers in Lauderdale County to secure data in regard to production practices. He found that the average grade level of those in the highest yield group was 8.4 years, as compared to 9.5 years for the lowest yield group. Seventy-five percent of the farmers were 45 years of age or older. The average of the highest yield group was 50.5, as compared to 50.6 for the lowest yield group. Eighty-four percent of the farmers in the highest yield group planted less than 15 acres of cotton, as compared to only 49 percent of the lowest yield group.

Sharp and Dotson (11:iii) in a study of significant woodland practices in five selected Tennessee counties found in comparing innovators with noninnovators, characteristically, the innovator: (1) had larger farms and woodlands in terms of both acres and dollar values; (2) more often lived on farms where woodland owned was located; (3) more often were full-time farmers or professional people; (4) were better educated; (5) more often were younger males; (6) had considerably higher average total gross family incomes; (7) more often had sought advice of professional foresters; and (8) were more interested in improving their woodland.

Lowe (8:16-19) completed a study of the production practices of burley tobacco growers in Williamson County in 1962. In this study he found some relation between characteristics of growers and yield. He reported that larger farms and cropland acreage was associated with higher yields of tobacco. Further, in this study he found that the age and educational levels of the growers was related to yields, with younger producers and those with higher educational levels tending to produce higher yields. Also, those farmers who depended on tobacco as a major source of income tended to produce lower yields.

In a similar study of tobacco producers in Trousdale County, Webster (14:93) reported that he found no positive relation between age or educational levels of tobacco producers and yields. The study also showed no clear relationship between farm size and yields.

Use of Recommended Practices and Relation to Yields

In the study of cotton producers in Lauderdale County, Peal (9:95) found that the farmers in the highest yield group had a higher

practice diffusion rating (4.12) than did those in the lowest yield group (3.97). In regard to 12 recommended cotton production practices the study showed that 71 percent of the highest yield group were "using" each practice, while 64 percent of those in the lowest yield group were doing so.

Webster (14:92) in a 1963 study of tobacco production practices in Trousdale County reported that growers in two above average groups were following more research-verified practices than those in the lower of two below average yield groups.

In a similar study of tobacco production practices in Williamson County, Lowe (8:71) reported that growers with considerably above average per acre tobacco yields more nearly approximated research-verified recommended cultural practices than growers with below average yields.

Factors Influencing Practice Adoption

Peal (9:iv) discovered some factors that seemed to influence practice adoption during his study of cotton producers. They included: (1) the net returns received per acre; (2) the adequacy of machinery and equipment; (3) the amount of technical knowledge of the operator; (4) the relative cost of the practices and benefits expected; and (5) the seriousness of land preparation, planting and harvesting problems peculiar to cotton.

He further noted that with regard to sources of cotton production advice the producers mentioned, neighbors and friends, dealers or salesmen and Extension agents. Other sources of information mentioned were farm magazines, television, radio and weekly newspapers.

II. OTHER RESEARCH

No research conducted in other states could be found regarding adoption of recommended soybean production practices by growers. Research relating to other enterprises was reviewed.

Kaufman and Bryant (6:1) in a study of characteristics of farmers following recommended practices in Mississippi found that the median operator in the two higher adoption groups was more than ten years younger than was the case in the lowest level group. The higher groups had decidedly larger proportions under 45 and much smaller proportions over 65. Lionberger (7:7-8) in a study of information seeking habits and characteristics of farm operators in Missouri found that farmers who used no institutionalized sources of farm information during the survey year averaged 12 years older than those who used such information.

Lionberger (7:9) further reported that almost one-fourth of the non-users of institutionalized sources of information had less than eight years of schooling compared to less than 10 percent of the groups that used county agent services and other institutionalized sources of farm information. Kaufman and Bryant (6:1) noted that 61 percent of the highest adoption group had nine years or more of schooling as compared to only 4 percent of the lowest group.

Frutchey and Williams (4:11) in a general summary of the findings and implications of a study of motivations of small woodland owners conducted in nine states recognized five adopter categories as: innovators, early adopters, early majority, late majority, and laggards. In this nine state study it was found that innovators generally (1) had more formal education, (2) were younger, (3) were more interested in woodland

improvement, (4) were more acquainted with the Agricultural Conservation Program, (5) had participated more in the ACP program; (6) were more interested in market and price information, knew where to get it, and preferred professional advice; (7) had used more woodland management practices, (8) were more interested in a woodland management plan, (9) tended to have a woodland management plan, (10) favored at least one of the three arrangements that were presented for assisting them in the management of their woodland, (11) had woodland acreage which was only slightly larger than noninnovators, (12) had a more friendly attitude toward the survey, (13) lived about as far from their woodland as the noninnovators, and (14) gave reasons for not using better management practices which were about the same as those of noninnovators.

Frutchey and Williams (4:7) reported adoption of woodland management practices might deny the owner satisfactions from other endeavors as evidenced by some of the reasons owners gave for not using better practices. Some factors mentioned were: (1) the use of time, indicating that "more rewarding activities claimed the owner's time," (2) the use of money, indicating that owners thought that "the cost of good woodland management practices outweighs possible benefits," (3) the timespan, indicating that owners thought there was "such a long time to grow timber and get an income from it."

CHAPTER III

METHODS AND PROCEDURE

To determine which farmers in Marion County were producing soybeans in 1968 and 1969, a list of farmers was obtained from the Marion Farmers Cooperative, the only firm that buys soybeans in Marion County. With the addition of the few farmers who were known to sell soybeans to another buyer, Central Soya of Chattanooga, a complete list of soybean producers in Marion County was compiled. Since the list included names of only 38 producers, it was decided to interview all growers.

An interview schedule was selected with the assistance of the Agronomy and Agricultural Extension Education staffs at The University of Tennessee. The schedule included questions regarding soybean production practices and other factors that were believed to influence yields of soybeans (see Appendix).

All soybean producers were visited and interviewed by the Extension Leader. Interviews covered the 1968 and 1969 crop years. The survey was completed on September 10, 1970.

Upon completion of the survey for this study it was found that in 1968, 38 farmers harvested soybeans on 3,879 acres, with an average yield of 20.9 bushels per acre. It was decided to include two crop years of data since 1968 was an extremely dry year and yields were lower than normal. In 1969, 38 farmers harvested soybeans on 3,926 acres, with an average yield of 25.7 bushels per acre.

The average yields for the 1968 and 1969 crop years were obtained and a two-year average computed for each producer. Producers were

divided into High and Low yield groups for study purposes. Those in the High yield group produced a two-year average of more than 23.3 bushels of soybeans per acre, while those in the Low yield group had averages below 23.3 bushels. The range for the High producers was from 24 to 35 bushels, while the range for the Low producers was from 13 to 23 bushels per acre.

Analyses were done, for the most part, in simple numbers and percents. Averages and medians were computed where applicable. Practice diffusion ratings and averages were computed for individual and production groups, based on the following weights: (1) 0 equals "unaware" of the practice; (2) 1 equals "aware" of the practice; (3) 2 equals "interested" in the practice; (4) 3 equals "planning to try" the practice; (5) 4 equals "tried" the practice, but not presently using it, and (6) 5 equals "using" the practice as recommended. Major comparisons were between High and Low yield groups. Because of the limited differences between High and Low yields of soybeans it was not considered to be feasible to attempt more groups. Chi square values were calculated to determine relationships where applicable. The .05 level of confidence was selected for testing. The relationship is shown as a footnote on each table where appropriate.

CHAPTER IV

FINDINGS OF THE STUDY

The findings of the study are presented in tables and discussed in the following pages. It should be remembered that the 38 soybean producers interviewed constituted both population and sample.

Relation of Major Occupation and Yields

It will be noted from Table I that 58 percent of the 38 soybean producers were full-time farmers, and the remaining 42 percent were part-time farmers. Comparison of the High and Low yield groups concerning these two categories shows little influence of occupation on yields of soybeans.

Relation of Soybeans as Major Source of Income and Yields

Sixty-six percent of the 38 soybean producers stated that soybeans was not their major source of income (see Table II). Seventy-one percent of the Low and 59 percent of the High yield groups did not depend on soybeans for the major portion of their income. The remaining 41 percent of the producers in the High yield group stated that soybeans was their major source of incomes, as compared to only 29 percent of the Low yield group. However, when the Chi square analysis was made, the relation between soybeans as a major source of income and yield was not found to be significant ($P < .05$).

TABLE I
 RELATIONS OF AVERAGE TWO-YEAR (1968 AND 1969) SOYBEAN
 YIELDS PRODUCED TO MAJOR OCCUPATIONS OF
 MARION COUNTY PRODUCERS^a

Major Occupation	Yield Group (Bushels per Acre)		
	Total (N=38) Percent	High Yield (N=17) Percent	Low Yield (N=21) Percent
Full-time farmer	58	59	57
Part-time farmer	42	41	43
Total	100.0	100.0	100.0

^aCalculated X^2 value = .01. Critical X^2 value for .05 level of significance with 1 df = 3.8. Not significant at .05 level.

TABLE II

RELATIONS OF AVERAGE TWO-YEAR (1968 AND 1969) SOYBEAN YIELDS
 PRODUCED TO WHETHER OR NOT SOYBEAN PRODUCTION WAS THE
 MAJOR SOURCE OF INCOME FOR MARION COUNTY PRODUCERS^a

Soybean Production Was Major Source of Income	Yield Group (Bushels per Acre)		
	Total (N=38) Percent	High Yield (N=17) Percent	Low Yield (N=21) Percent
Yes	34	41	29
No	66	59	71
Total	100.00	100.0	100.0

^aCalculated X^2 value = .66. Critical X^2 value for .05 level of significance with 1 df = 3.84. Not significant at .05 level.

Relation of Other Major Sources of Income and Yields

One-half of the 38 soybean producers did not answer the question concerning other major sources of income.

It will be noted from Table III that 33 percent of the producers in the Low yield group had swine as a major source of income, while only 6 percent of the High yield group gave this as a major source of income. The situation is reversed for dairying as a major source of income. Eighteen percent of the High yield group listed dairying as a major source of income, while only 5 percent of the Low yield group did so. Other than these two comparisons there seems to be little relation between other major sources of income and yields of soybeans. The relationship did not achieve the required level ($P < .05$) of probability, but did reach the .30 level of confidence.

Relation of Educational Levels and Yields

Sixty-one percent of the 38 soybean producers completed grades 10-13 (see Table IV). The next largest group, 34 percent, had completed nine years or less in school, while 5 percent had from 14 to 18 years of education. The average for all producers was 9.5, considerably above the 1960 county average of 8.1 (1:38). Larger numbers of both yield groups had from 10 to 13 years of education. Of the Low yield group 38 percent completed grades 1-9, while 29 percent of the High yield group attained this lower level of education. Sixty-five percent of the High yield group completed grades 10-13, while only 57 percent of the Low yield group completed this level of education. The average level for the High yield group was 9.9 and for the Low yield group was 9.2. The Chi square value did not achieve the required level of significance.

TABLE III
 RELATIONS OF AVERAGE TWO-YEAR (1968 AND 1969) SOYBEAN YIELDS
 PRODUCED TO OTHER MAJOR SOURCES OF INCOME FOR
 MARION COUNTY PRODUCERS^a

Other Major Sources of Income	Yield Group (Bushels per Acre)		
	Total (N=38) Percent	High Yield (N=17) Percent	Low Yield (N=21) Percent
Not answered	50	53	48
Swine	21	6	33
Dairy	11	18	5
Wage Earner	11	12	9
Cattle	5	6	5
Poultry	2	6	0
Total	100.0	100.0	100.0

^aCalculated X^2 value = 6.02. Critical X^2 value for .05 level of significance with 5 df = 11.07. Not significant at .05 level.

TABLE IV
 RELATIONS OF AVERAGE TWO YEAR (1968 AND 1969) SOYBEAN
 YIELDS PRODUCED TO EDUCATIONAL LEVELS
 OF MARION COUNTY PRODUCERS^a

Educational Level	Yield Group (Bushels per Acre)		
	Total (N=38) Percent	High Yield (N=17) Percent	Low Yield (N=21) Percent
1 - 9	34	29	38
10 - 13	61	65	57
14 - 18	5	6	5
Total	100.0	100.0	100.0
Average Educational Level (Grades)	9.5	9.9	9.2

^aCalculated X^2 value = .31. Critical X^2 value for .05 level of significance with 2 df = 5.99. Not significant at .05 level.

Relation of Age of Soybean Producers and Yields

Reference to Table V shows that 42 percent of the soybean producers were 25 to 45 years of age. Twenty-six percent were from 45 to 55 years of age and 29 percent were 55 to 65 years of age. Only 3 percent were 65 to 75 years of age, and none were over 75 years of age. Average ages were for all producers 47.1 years, for High yield group were 46.8 and for Low yield group 47.9 years. The Chi square value did not attain the required level ($P < .05$) level of confidence. Age levels did not appear to influence yield levels of soybeans produced, though High yield people were very slightly younger than the Low.

Relation of Gross Family Income and Yields

It is interesting to note that almost equal percents of both the High and Low yield groups listed gross family incomes of from 0 to 10,000 dollars (see Table VI). Twenty-nine percent of the Low yield group reported gross family incomes of 10,000 to 20,000 dollars, as compared to only 12 percent of the High yield group. However, 35 percent of the High yield group indicated gross family incomes of 20,000 dollars or more, while only 19 percent of the Low yield group mentioned this level of gross family income. Though the Chi square value was not significant, the High yield group (\$17,499 median) did have a higher median gross family income than the Low (\$13,338). However, no clear relation could be established. Note that large groups did not answer this optional question.

Relation of Average Soybean Yields and Attitude Toward Survey

It will be noted from Table VII that all soybean producers were considered to be "friendly" or "somewhat friendly" toward the survey,

TABLE V
 RELATIONS OF AVERAGE TWO-YEAR (1968 AND 1969) SOYBEAN YIELDS
 PRODUCED TO AGES OF MARION COUNTY PRODUCERS^a

Ages of Farmers Interviewed	Yield Group (Bushels per Acre)		
	Total (N=38) Percent	High Yield (N=17) Percent	Low Yield (N=21) Percent
25 - 44	42	41	43
45 - 54	26	30	24
55 - 64	29	29	28
65 - 74	3	0	5
Total	100.0	100.0	100.0
Average Age (years)	47.1	46.8	47.9

^aCalculated X^2 value = 0.93. Critical X^2 value for .05 level of significance with 3 df = 7.82. Not significant at .05 level.

TABLE VI
 RELATIONS OF AVERAGE TWO-YEAR (1968 AND 1969) SOYBEAN
 YIELDS PRODUCED TO TOTAL GROSS FAMILY INCOMES OF
 MARION COUNTY PRODUCERS^a

Gross Family Income	Yield Group (Bushels per Acre)		
	Total (N=38) Percent	High Yield (N=17) Percent	Low Yield (N=21) Percent
Not answered	21	24	19
0 - 9,999	32	29	33
10,000 - 19,999	21	12	29
20,000 - Over	26	35	19
Total	100.0	100.0	100.0
Median Gross Family Income ^b	\$14,375	\$17,499	\$13,333

^aCalculated X^2 value = 2.20. Critical X^2 value for .05 level of significance with 3 df = 7.82. Not significant at .05 level.

^bFor those answering.

TABLE VII
 RELATIONS OF AVERAGE TWO-YEAR (1968 AND 1969) SOYBEAN YIELDS
 PRODUCED BY MARION COUNTY PRODUCERS AND THEIR
 APPARENT ATTITUDES TOWARD THE SURVEY^a

Apparent Attitude Toward Survey	Yield Groups (Bushels per Acre)		
	Total (N=38) Percent	High Yield (N=17) Percent	Low Yield (N=21) Percent
Friendly	95	94	95
Somewhat friendly	5	6	5
Total	100.0	100.0	100.0

^aCalculated X^2 value = .02. Critical X^2 value for .05 level of significance with 1 df = 3.84. Not significant at .05 level.

and 95 percent were "friendly." Almost equal percents of the High and Low yield groups were in these two categories.

There seemed to be no relation between yields produced and attitude toward the survey. The Chi square value was not significant at any level.

Relation of Average Soybean Yields Produced and Interest in Improvements

Table VIII shows the interest, in the judgement of the interviewer, of the 38 soybean producers in improving their soybean yields. Forty-five percent were considered to be "very interested," 47 percent "somewhat interested," and 8 percent were "indifferent."

In comparing the two yield groups, 53 percent of the High yield group were considered to be "very interested," while 38 percent of the Low yield group was considered to have this level of interest. Fifty-seven percent of the Low yield group were considered to be "somewhat interested," as compared to 35 percent of the High yield group. Twelve percent of the High yield group seemed to be "indifferent," as compared to 5 percent of the Low yield group.

The findings represented in this table seem to be somewhat inconsistent. The Chi square value was not significant.

Relation of Soybean Yields Produced and Stage of Practice Adoption

Table IX reveals the interviewer's judgement concerning the level of recommended practice adoption of the 38 soybean producers, and of the High and Low yield groups.

Thirty-two percent of the 38 soybean producers were considered to be "soon after the first few" on the adoption scale, 29 percent "among

the first few" and 24 percent "sooner than average." Smaller percents were considered to be lower on the adoption scale.

In comparing the two yield groups it will be noted that 35 percent of the High yield group were considered to be "among the first few," while only 24 percent of the Low yield group were thought of as ranking this high on the adoption scale. However, 38 percent of the Low yield group were "soon after the first few," while only 23 percent of the High yield group were ranked this high by the interviewer. Thirty-three percent of the Low yield group were "sooner than average," compared to 12 percent of the High yield group. Eighteen percent of the High yield group were "a little" later than most, while only 5 percent of the Low yield group were considered by the interviewer to be so low on the adoption scale. Twelve percent of the High yield group were considered to be "among the last few," while none of the Low yield group were considered to be in this category.

The findings revealed in this table do not fit a consistent pattern. The Chi square value was not significant at the level ($P < .05$) of probability selected for testing, though it did achieve the .20 level.

Relation of Average Soybean Yields and How Well Interviewer Knew

Producers

The interviewer knew 53 percent of the 38 soybean producers "very well," 34 percent "fairly well," 8 percent "not very well," and 5 percent "not at all" (see Table X).

In comparing the two yield groups it will be noted that the interviewer knew 65 percent of the High yield group "very well," as compared to 43 percent of the Low yield group. Forty-seven percent of the

TABLE X

RELATIONS OF AVERAGE TWO-YEAR (1968 AND 1969) SOYBEAN YIELDS
PRODUCED AND HOW WELL MARION COUNTY PRODUCERS WERE KNOWN^a

How Well Respondent Was Known	Yield Groups (Bushels per Acre)		
	Total (N=38) Percent	High Yield (N=17) Percent	Low Yield (N=21) Percent
Very well	53	65	43
Fairly well	34	17	47
Not very well	8	12	5
Not at all	5	6	5
Total	100.0	100.0	100.0

^aCalculated X^2 value = 4.79. Critical X^2 value for .05 level of significance with 3 df = 7.82. Not significant at .05 level.

Low yield group were known "fairly well," while 17 percent of the High yield group were known this well. Twelve percent of the High yield group were "not very well" known, as compared to 5 percent of the Low yield group. Practically equal percents were known "not at all," being one producer in each yield group.

There seemed to be little relation of average soybean yields produced and how well the interviewer knew each producer. The Chi square value did not achieve the level ($P < .05$) of probability selected for testing, though it did reach the .30 level of significance.

Relation of Size of Farm and Yields

Data in Table XI show that 40 percent of the 38 soybean producers interviewed had farms of less than 150 acres. The next largest group (34 percent) had farms of 300 to 1,000 acres, while 15 percent had from 150 to 300 acres, and 10 percent had 1,000 acres or more. The average acreages were 430 acres for all producers, 498 acres for the High, and 365 acres for the Low yield groups.

It was noted that 59 percent of the producers in the High yield group had farms of 300 acres or more, while only 33 percent of the Low yield group had farms that large. These comparisons indicate a slight tendency for High yields to be associated with larger farms. The relation did not achieve the required level ($P < .05$) of probability, but it did reach the .30 level of confidence.

Relation of Acres of Cropland and Yields

Sixty percent of the 38 soybean producers had less than 150 acres of cropland (see Table XII), while 24 percent had from 150 to 300 acres. Sixteen percent had 300 or more acres of cropland.

TABLE XI
RELATIONS OF AVERAGE TWO-YEAR (1968 AND 1969) SOYBEAN YIELDS
PRODUCED TO NUMBER OF ACRES IN FARMS OF
MARION COUNTY PRODUCERS^a

Number of Acres in Farm	Yield Group (Bushels per Acre)		
	Total (N=38) Percent	High Yield (N=17) Percent	Low Yield (N=21) Percent
1 - 149	40	29	48
150 - 299	16	12	19
300 - 999	34	47	24
1000 - 2000	10	12	9
Total	100.0	100.0	100.0
Average (acres)	430	498	365

^aCalculated X^2 value = 3.6. Critical X^2 value for .05 level of significance with 3 df = 7.8. Not significant at .05 level.

TABLE XIII

RELATIONS OF AVERAGE TWO-YEAR (1968 AND 1969) SOYBEAN YIELDS
 PRODUCED TO THE NUMBERS OF ACRES PLANTED BY
 MARION COUNTY PRODUCERS^a

Number of Soybean Acres Planted	Yield Group (Bushels per Acre)		
	Total (N=38) Percent	High Yield (N=17) Percent	Low Yield (N=21) Percent
8 - 49	26	35	19
50 - 99	29	18	38
100 - 149	16	6	24
150 - 322	29	41	19
Total	100.0	100.0	100.0
Average planted (acres)	102	92	114

^aCalculated X^2 value = 5.80. Critical X^2 value for .05 level of significance with 3 df = 7.82. Not significant at .05 level.

The Chi square value was not significant at the required level ($P < .05$). Therefore there seemed to be little, if any, tendency for size of planters and equipment to be related with yield.

Relation of Previous Crop Grown and Yields

It is evident from the data in Table XVI that most farmers plant soybeans in fields that had previously been planted in corn or soybeans. Eighty-nine percent of the 38 soybean producers planted soybeans following either soybeans or corn. Small percents (3) followed fescue and grain sorghum with soybeans. Three percent planted fields that had been idle the previous two years.

It is evident from the data that no positive relation existed between previous crops grown and higher yields of soybeans. The Chi square value was not significant.

Relation of Texture of Soil and Yields

Study of Table XVII reveals that 61 percent of the 38 producers planted soybeans on soil of loamy texture, 24 percent used sandy soil, and 8 used both sandy and loamy textured soil. One producer used clay soil and one used cherty soil, with both being in the High yield group. The Chi square value did not achieve the level ($P < .05$) of probability selected for testing, though it did reach the .20 level of significance. The data may indicate some relation between soil texture and yields, though what the relation might be is unclear.

Relation of pH Level and Yields

Twenty-four percent of the 38 soybean producers did not answer the question concerning pH levels of their soils (see Table XVIII).

TABLE XVI

RELATIONS OF AVERAGE TWO-YEAR (1968 AND 1969) SOYBEAN YIELDS
PRODUCED AND WHAT CROPS WERE GROWN IN SOYBEAN FIELDS TWO
YEARS AGO BY MARION COUNTY PRODUCERS^a

Crops Grown in Soybean Fields Two Years Ago	Yield Group (Bushels per Acre)		
	Total (N=38) Percent	High Yield (N=17) Percent	Low Yield (N=21) Percent
Not answered	2	6	0
Soybeans	46	50	43
Soybeans and corn	22	6	33
Corn	21	25	19
Gr. Sorghum	3	7	0
Nothing	3	6	0
Fescue	3	0	5
Total	100.0	100.0	100.0

^aCalculated X^2 value = 8.10. Critical X^2 value for .05 level of significance with 7 df = 14.07. Not significant at .05 level.

TABLE XVII

RELATIONS OF AVERAGE TWO-YEAR (1968 AND 1969) SOYBEAN YIELDS
 PRODUCED TO TEXTURE OF SOYBEAN LAND USED BY
 MARION COUNTY PRODUCERS^a

Texture of Land	Yield Groups (Bushels per Acre)		
	Total (N=38) Percent	High Yield (N=17) Percent	Low Yield (N=21) Percent
Sandy	24	17	28
Loamy	61	53	67
Clay	3	6	0
Cherty	2	6	0
Sandy and Loamy	8	18	0
Sandy, Loamy, and Clay	2	0	5
Total	100.0	100.0	100.0

^aCalculated X^2 value = 7.39. Critical X^2 value for .05 level of significance with 5 df = 11.07. Not significant at .05 level.

TABLE XVIII

RELATION OF AVERAGE TWO-YEAR (1968 AND 1969) SOYBEAN YIELDS
 PRODUCED TO WHETHER LAND TESTED WAS ABOVE OR BELOW
 6.0 IN pH ACCORDING TO MARION COUNTY PRODUCERS^a

pH was Above or Below 6.0	Yield Groups (Bushels per Acre)		
	Total (N=38) Percent	High Yield (N=17) Percent	Low Yield (N=21) Percent
Not answered	24	30	19
Does not apply	8	6	9
Above	24	29	19
Below	44	35	53
Total	100.0	100.0	100.0

^aCalculated X^2 value = 1.62. Critical X^2 value for .05 level of significance with 3 df = 7.82. Not significant at .05 level.

The question did not apply to 8 percent of the producers. Fifty-four percent said the pH of their soil was below 6.0, and the remaining 24 percent said that it was above 6.0. Thirty percent of the High yield group did not answer the question, as compared to 19 percent of the Low yield group. Twenty-nine percent of the High yield group indicated that the pH of their soil was above 6.0, as compared to 19 percent of the Low yield group. Fifty-three percent of the Low yield group said the pH of their soil was below 6.0, as compared to 35 percent of the High yield group. These comparisons indicate that higher percents of the High yield group grew soybeans on soils with a pH level above 6.0 than did the Low yield group. However, the Chi square value was not significant at the level ($P < .05$) selected for testing.

Relation of Type of Combine Used and Yields

It will be noted from Table XIX that there seemed to be no relation between type of combine used and yields of soybeans, since almost equal percents of both the High and Low yield groups had used the two types of combines. The Chi square value was not significant.

Relation of Where Soybeans Were Marketed and Yields

Seventy-six percent of the 38 soybean producers marketed their soybeans at Jasper, 8 percent at Chattanooga, and 16 percent marketed soybeans at both locations (see Table XX).

Eighty-eight percent of the High yield group marketed their soybeans at Jasper, as compared to 67 percent of the Low yield group. Fourteen percent of the Low yield group marketed soybeans only at Chattanooga, while none of the High yield group did so.

TABLE XIX
 RELATIONS OF AVERAGE TWO-YEAR (1968 AND 1969) SOYBEAN YIELDS
 PRODUCED AND TYPE OF COMBINE USED IN HARVESTING SOYBEANS
 BY MARION COUNTY PRODUCERS^a

Type of Combine Used in Harvesting	Yield Groups (Bushels per Acre)		
	Total (N=38) Percent	High Yield (N=17) Percent	Low Yield (N=21) Percent
Pull-type	24	23	24
Self-propelled	71	71	71
Both	5	6	5
Total	100.0	100.0	100.0

^aCalculated X^2 value = .02. Critical X^2 value for .05 level of significance with 3 df = 7.82. Not significant at .05 level.

TABLE XX
 RELATIONS OF AVERAGE TWO-YEAR (1968 AND 1969) SOYBEAN YIELDS
 PRODUCED AND WHERE SOYBEANS WERE MARKETED
 BY MARION COUNTY PRODUCERS^a

Where Soybeans were Marketed	Yield Groups (Bushels per Acre)		
	Total (N=38) Percent	High Yield (N=17) Percent	Low Yield (N=21) Percent
Jasper	76	88	67
Chattanooga	8	0	14
Jasper and Chattanooga	16	12	19
Total	100.0	100.0	100.0

^aCalculated X^2 value = 3.32. Critical X^2 value for .05 level of significance with 2 df = 5.99. Not significant at .05 level.

These comparisons show that higher percents of the High yield group marketed their soybeans at Jasper than did the Low yield group, although the relation was not significant at the level ($P < .05$) of probability selected for testing. It should be noted that the relation did reach the .20 level of significance.

Relation of Climatic Conditions and Yields

Table XXI reveals that 95 percent of the 38 soybean producers considered climatic conditions to have been unfavorable for the years of 1968 and 1969. Two percent considered the climatic conditions to have been favorable and 3 percent did not answer the question.

It will also be noted that all of the 17 soybean producers in the High yield group said the climatic conditions in 1968 and 1969 were unfavorable, while 90 percent of the Low yield group considered climatic conditions to have been this bad. However, no conclusions can be reached by these comparisons, since the Chi square value did not achieve the level ($P < .05$) of probability selected for testing.

Relation of Climatic Conditions at Planting and Yields

Study of Table XXII reveals that 92 percent of the 38 soybean producers stated they experienced good climatic conditions at planting, while 5 percent felt climatic conditions were only fair and 3 percent said climatic conditions were poor at planting.

In comparing the two yield groups it will be noted that 94 percent of the High yield group judged climatic conditions at planting for 1968 and 1969 as good, while 90 percent of the Low yield group did so. Six percent of the High yield group stated that climatic conditions at

TABLE XXI

RELATIONS OF AVERAGE TWO-YEAR (1968 AND 1969) SOYBEAN YIELDS
 PRODUCED AND GENERAL CLIMATIC CONDITIONS AS REPORTED BY
 MARION COUNTY PRODUCERS^a

General Climatic Conditions	Yield Groups (Bushels per Acre)		
	Total (N=38) Percent	High Yield (N=17) Percent	Low Yield (N=21) Percent
Not answered	3	0	5
Favorable	2	0	5
Unfavorable	95	100	90
Total	100.0	100.0	100.0

^aCalculated X^2 value = 1.71. Critical X^2 value for .05 level of significance with 2 df = 5.99. Not significant at .05 level.

TABLE XXII

RELATIONS OF AVERAGE TWO-YEAR (1968 AND 1969) SOYBEAN YIELDS
 PRODUCED AND GENERAL CLIMATIC CONDITIONS AT PLANTING TIME
 AS REPORTED BY MARION COUNTY PRODUCERS^a

Climatic Conditions at Planting Time	Yield Groups (Bushels per Acre)		
	Total (N=38) Percent	High Yield (N=17) Percent	Low Yield (N=21) Percent
Good	92	94	90
Fair	5	0	10
Poor	3	6	0
Total	100.0	100.0	100.0

^aCalculated X^2 value = 2.87. Critical X^2 value for .05 level of significance with 2 df = 5.99. Not significant at .05 level.

planting were poor, and 10 percent of the Low yield group said that climatic conditions were only fair at planting.

No positive relation of climatic conditions at planting and yields of soybeans was revealed in this study, since the Chi square value was not significant at the level selected for testing.

Relation of Climatic Conditions During Growing Season and Yields

It is readily apparent from the data in Table XXIII that there was no relation between climatic conditions during the growing seasons of 1968 and 1969 and yields of soybeans. The Chi square value was not significant.

Relation of Climatic Conditions During Harvest and Yields

All of the 38 soybean producers said that climatic conditions during harvest were good in 1968 and 1969, thus no relation could be shown.

Relation of Average Soybean Practice Diffusion Ratings and Total Average Ratings and Yields

Table XXIV shows the average practice diffusion ratings of soybean producers in the total, High and Low yield groups for the 11 recommended production practices surveyed. It will be noted that the producers in the High yield group had a higher total average practice diffusion rating (4.48) than the Low yield group which had a rating of 4.37. This suggests that some relation may exist between recommended practice adoption and higher yields of soybeans.

TABLE XXIII

RELATIONS OF AVERAGE TWO-YEAR (1968 AND 1969) SOYBEAN YIELDS
 PRODUCED AND GENERAL CLIMATIC CONDITIONS DURING GROWING
 SEASON AS REPORTED BY MARION COUNTY PRODUCERS^a

Climatic Conditions During Growing Season	Yield Group (Bushels per Acre)		
	Total (N=38) Percent	High Yield (N=17) Percent	Low Yield (N=21) Percent
Good	0	0	0
Fair	13	12	14
Poor	87	88	86
Total	100.0	100.0	100.0

^aCalculated X^2 value = .05. Critical X^2 value for .05 level of significance with 2 df = 5.99. Not significant at .05 level.

TABLE XXIV

AVERAGE SOYBEAN PRACTICE DIFFUSION RATINGS AND TOTAL AVERAGE RATINGS
FOR ALL MARION COUNTY PRODUCERS, HIGH AND LOW YIELD GROUPS

Soybean Production Practices	Total Av. Rating	High Yield Av. Rating	Low Yield Av. Rating
1. Planted a soybean variety or varieties recommended last year.	5.00	5.00	5.00
2. Planted between May 1 and June 15 last year.	4.89	5.00	4.81
3. Used inoculant on seed or grew soybeans in all fields at least one year in the last three years prior to the last.	4.32	4.24	4.38
4. Treated seed with Molybdenum where lime was not used or where pH was below 6.0.	3.87	3.65	4.05
5. Used recommended seeding rate.	4.95	5.00	4.90
6. Prepared seedbed in advance of planting.	4.89	4.77	5.00
7. Fertilized (including liming) according to soil test recommendations.	3.50	3.76	3.29
8. Effectively controlled weeds last year by using recommended procedures.	4.74	4.94	4.57
9. Effectively controlled insects last year by using recommended procedures.	4.79	4.82	4.76
10. Harvested when moisture was between 10 and 15 percent.	4.21	4.18	4.24
11. Got the advice of professionals in the area of soybean production and marketing.	3.47	3.88	3.14
Total Average Rating	4.42	4.48	4.37

Practices 1, 2, 3, 4, 5, 6, and 7 related to production procedures up to and including planting. It will be noted that all producers planted recommended varieties of soybeans. The High yield group had a slightly higher diffusion rating with regard to recommended planting dates than did the Low yield group (5.00 and 4.81, respectively). The same was true concerning Practice 5--"recommended seeding rates" (5.00 compared to 4.90), and Practice 7--"fertilized (including lime) according to soil test recommendations" (3.76 compared to 3.29). However, the Low yield group had higher ratings with regard to Practice 3--"used inoculant on seed or grew soybeans in all fields at least one year in the last three years prior to the last" (4.38 compared to 4.24), Practice 4--"treated seed with Molybdenum where lime was not used or where pH was below 6.0" (4.05 compared to 3.65), and Practice 6--"prepared seedbed in advance of planting" (5.00 compared to 4.77).

In terms of practice diffusion, Practice 7 appeared to have the greatest difference between High and Low yield groups, the former falling in the "tried" stage and the latter only "planning to try" the practice.

Practices 8 and 9 related to procedures from time of planting to harvest. The High yield group showed higher diffusion ratings for both practices, as follows: (1) Practice 8--"effectively controlled weeds last year by using recommended procedures" (4.94 and 4.57, respectively), and (2) Practice 9--"effectively controlled insects last year by using recommended procedures" (4.82 and 4.76, respectively). Thus, both groups averaged in the "using" stage on these two practices.

Practice 10 related to harvesting soybeans at moisture levels from 10 to 15 percent. It will be noted that the Low yield group had a higher practice diffusion rating than the High in this case (4.24 vs 4.18). This may be accounted for by the fact that more producers in the High yield group grew larger acreages of soybeans and preferred to start harvesting at higher moisture levels in order to complete harvesting on time. Both groups were in the "tried" stage of diffusion.

Practice 11, although not strictly a production practice, related to overall production and marketing. It may be seen that the High yield group had a higher practice diffusion rating than the Low yield group with regard to Practice 11--"got the advice of professionals in the area of soybean production and marketing" (3.88 vs 3.14). The High group averaged in the "tried" stage; while the Low were in the "planning to try" stage.

Percents of Marion County Farmers Interviewed With Regard to Soybean Production Practices

Table XXV shows the percents of the 38 farmers in both High and Low yield group at the various stages of the diffusion process with regard to the 11 recommended production practices surveyed. Tables XXVI and XXVII present data for the High and Low yield groups, respectively.

It is interesting to note that in regard to the whole package of 11 recommended practices, about the same percents of the High (84) and Low (85) were using the practices.

It will be seen that 100 percent of the High yield group planted soybeans within recommended planting dates, while 95 percent of the Low

TABLE XXV

PERCENTS OF ALL MARION COUNTY PRODUCERS AT VARIOUS STAGES OF THE DIFFUSION
PROCESS WITH REGARD TO USE OF SOYBEAN PRODUCTION PRACTICES

Soybean Production Practices	Total (N=38) %	Unaware %	Aware %	Interested %	Plan to Try %	Tried and Not Using %	Using %
1. Planted a soybean variety or varieties recommended last year.	100.0	0	0	0	0	0	100.0
2. Planted between May 1 and June 15 last year.	100.0	0	3	0	0	0	97
3. Used inoculant on seed or grew soybeans in all fields at least one year in the last three years prior to the last.	100.0	2	13	0	0	3	82
4. Treated seed with Molybdenum where lime was not used or where pH was below 6.0.	100.0	8	18	0	0	0	74
5. Used recommended seeding rate.	100.0	0	0	0	0	5	95
6. Prepared seedbed in advance of planting.	100.0	0	3	0	0	0	97
7. Fertilized (including liming) according to soil test recommendations.	100.0	0	14	3	0	18	65
8. Effectively controlled weeds last year by using recommended procedures.	100.0	0	5	0	0	5	90
9. Effectively controlled insects last year by using recommended procedures.	100.0	2	0	3	0	0	95
10. Harvested when moisture was between 10 and 15 percent.	100.0	0	18	0	0	5	77

TABLE XXV (continued)

Soybean Production Practices	Total (N=38) %	Unaware %	Aware %	Interested %	Plan to Try %	Tried and Not Using %	Using %
11. Got the advice of professionals in the area of soybean production and marketing.	100.0	0	34	3	3	2	58
Total Average Percent	100.0	1	10	1	0	3	85

yield group did so. Essentially the same percentage of both groups reportedly inoculated soybean seed when needed. However, it is interesting to note that 15 percent of the producers (18 percent of the High and 14 percent of the Low) were not even interested in the practice. All others were either "using" the practice or had "tried" it.

It is surprising to note that 17 percent of the producers in the High yield group seemed "unaware" of the practice of "treating seed with Molybdenum where lime had not been used or where the pH was below 6.0." All of the producers in the Low yield group were at least "aware" of the practice, and 76 percent of them were "using" the practice, as compared with 71 percent of the High yield group.

Nearly all High (100 and 94 percents, respectively), producers were "using" Practices 5 and 6, as was true also for the Low (91 and 100 percents, respectively).

In regard to Practice 7--"fertilizing and liming according to soil test recommendations," 86 percent of the Low yield group producers were "using" the practice, while only 41 percent of the High yield group were doing so. All producers were at least "aware" of the practice. It is interesting to note that 35 percent of the High yield group had tried the practice, but were no longer using it regularly, while only 5 percent of the Low yield producers had quit the practice after using it.

Ninety-four percent of the High yield group used Practice 8--"effectively controlled weeds by following recommended practices," while 86 percent of the Low yield group did so. Recommended practices included both cultivation and chemical weed control. One producer in each group had tried chemical weed control, but was no longer doing so.

Only one producer in each group believed that he had encountered insect problems that needed to be controlled (Practice 9), stating that insect problems were minor. One producer in the Low yield group was interested in the practice, stating that stink bugs were becoming a problem.

All producers were at least "aware" of the importance of "harvesting soybeans at moisture levels of 10 to 15 percent" (Practice 10). However, 81 percent of the Low yield group followed the practice, compared to only 70 percent of the High yield group. As noted before, this may be because more High yield producers had larger acreages of soybeans and preferred to start harvesting a little earlier to avoid possible undesirable weather later on.

In regard to Practice 11--"getting the advice of professionals in the area of soybean production and marketing," a much higher percent (71) of the High yield group was using the practice. Only 48 percent of the Low yield group had sought the advice of professionals. All producers were aware that professional advice was available.

Relation of Average Practice Diffusion Ratings and Total Average Ratings and Soybean Yields

It will be noted from Table XXVIII that of the 38 soybean producers, 47 percent had average practice diffusion ratings of 4.50 to 5.00, indicating that in the main they were "using" recommended production and marketing practices. It will also be noted that 53 percent of the producers in the High yield group were, in the main, "using" recommended production and marketing practices, as compared to only 43 percent of the

TABLE XXIX

RELATIONS OF AVERAGE TWO-YEAR (1968 AND 1969) SOYBEAN YIELDS
 PRODUCED TO NUMBER OF WEEKS AHEAD OF TIME SEEDBED
 WAS PREPARED BY MARION COUNTY PRODUCERS^a

Number of Weeks Ahead of Time Seedbed Was Prepared	Yield Group (Bushels per Acre)		
	Total (N=38) Percent	High Yield (N=17) Percent	Low Yield (N=21) Percent
1-5 weeks	21	24	19
6 weeks	47	41	52
7 weeks	3	0	5
8 weeks - 20 weeks	29	35	24
Total	100.0	100.0	100.0

^aCalculated X^2 value = 1.58. Critical X^2 value for .05 level of significance with 3 df = 7.82. Not significant at .05 level.

TABLE XXX
 RELATIONS OF AVERAGE TWO-YEAR (1968 AND 1969) SOYBEAN YIELDS
 PRODUCED TO WIDTH OF ROWS PLANTED BY
 MARION COUNTY PRODUCERS^a

Width of Row Planted	Yield Groups (Bushels per Acre)		
	Total (N=38) Percent	High Yield (N=17) Percent	Low Yield (N=21) Percent
Under 36 inches	18	6	28
36 inches	42	41	43
38 inches	37	53	24
40 inches	3	0	5
Total	100.0	100.0	100.0

^aCalculated X^2 value = 5.61. Critical X^2 value for .05 level of significance with 3 df = 7.82. Not significant at .05 level.

planted in 40 inch rows. Small amounts of soybeans were broadcast seeded and are not represented in this table.

Fifty-three percent of the High yield group planted in 38 inch rows, as compared to 24 percent of the Low yield group. It also will be noted that 28 percent of the Low yield group planted in rows of under 36 inches in width, while only 6 percent of the High yield group did so. The Chi square value did not reach the required level, though it did attain significance at a lower level of .20.

These comparisons suggest a slight tendency for higher yields of soybeans to be associated with row widths of 38 inches, and for lower yields to be associated with row widths of less than 36 inches.

Relation of Source of Seed and Yields

Study of Table XXXI reveals that 73 percent of all soybean producers bought seed from a dealer, 11 percent each bought from another farmer and save their own seed. Two Low producers stated they bought some seed from a dealer and from this planting saved seed to use the following year.

It will be noted that 82 percent of the High yield group bought seed from a dealer, as compared to 67 percent of the Low yield group. Nineteen percent of the Low yield group saved their own seed, while no producer in the High yield group did so. The Chi square value did not achieve the required .05 level, though it did reach the .10 level of confidence. There seemed to be some relation between the source of seed and yields of soybeans, though what the relation might be is unclear.

TABLE XXXI

RELATIONS OF AVERAGE TWO-YEAR (1968 AND 1969) SOYBEAN YIELDS
 PRODUCED TO WHERE SEED WAS OBTAINED BY
 MARION COUNTY PRODUCERS^a

Where Seed Was Obtained	Yield Groups (Bushels per Acre)		
	Total (N=38) Percent	High Yield (N=17) Percent	Low Yield (N=21) Percent
Dealer	73	82	67
Farmer	11	18	5
Saves own	11	0	19
Dealer and saves own	5	0	9
Total	100.0	100.0	100.0

^aCalculated X^2 value = 6.65. Critical X^2 value for .05 level of significance with 3 df = 7.82. Not significant at .05 level.

Relation of Use of Certified Seed and Yields

Table XXXII indicates that 16 percent of the 38 soybean producers apparently did not know whether they bought certified seed or not, since they were not able to answer the question. Sixty-eight percent stated they did not use certified seed, while 16 percent did purchase certified seed.

A slightly higher percent (18) of the High yield group stated that they used certified seed, since only 14 percent of the Low yield group followed the practice. The Chi square value was not significant. Therefore, use of certified seed did not appear in this study to be related with yields.

Relation of Use of Registered Seed and Yields

Seventy-six percent of the 38 soybean producers and Low yield group members did not use registered seed. The remainder, did use such seed (see Table XXXIII).

For the High yield group, 77 percent did not use registered seed and 23 percent did. No significant relation was established between use of such seed and yield of soybeans.

Relation of Pounds of Seed Planted Per Acre and Yields

Table XXXIV shows that 53 percent of the 38 producers planted within the recommended range of 42 to 51 pounds of seed per acre. Fewer farmers planted at lower seeding rates, and one producer did not know.

It will be noted that 65 percent of the High yield group and only 43 percent of the Low planted within the recommended range.

TABLE XXXII

RELATIONS OF AVERAGE TWO-YEAR (1968 AND 1969) SOYBEAN YIELDS
 PRODUCED TO WHETHER CERTIFIED SEED WAS PLANTED
 BY MARION COUNTY PRODUCERS^a

Certified Seed Was Planted	Yield Groups (Bushels per Acre)		
	Total (N=38) Percent	High Yield (N=17) Percent	Low Yield (N=21) Percent
Yes	16	18	14
No	84	82	86
Total	100.0	100.0	100.0

^aCalculated X^2 value = .09. Critical X^2 value for .05 level of significance with 1 df = 3.84. Not significant at .05 level.

TABLE XXXIII

RELATIONS OF AVERAGE TWO-YEAR (1968 AND 1969) SOYBEAN YIELDS
 PRODUCED TO WHETHER REGISTERED SEED WAS PLANTED
 BY MARION COUNTY PRODUCERS^a

Registered Seed Was Planted	Yield Groups (Bushels per Acre)		
	Total (N=38) Percent	High Yield (N=17) Percent	Low Yield (N=21) Percent
Yes	24	23	24
No	76	77	76
Total	100.0	100.0	100.0

^aCalculated X^2 value = .40. Critical X^2 value for .05 level of significance with 2 df = 5.99. Not significant at .05 level.

TABLE XXXIV
 RELATIONS OF AVERAGE TWO-YEAR (1968 AND 1969) SOYBEAN YIELDS
 PRODUCED TO POUNDS OF SEED PLANTED PER ACRE BY
 MARION COUNTY PRODUCERS^a

Pounds of Seed Planted Per Acre	Yield Groups (Bushels per Acre)		
	Total (N=38) Percent	High Yield (N=17) Percent	Low Yield (N=21) Percent
Did not know	3	6	0
25 - 31	26	6	43
32 - 41	18	23	14
42 - 45	45	53	38
46 - 51	8	12	5
Total	100.0	100.0	100.0

^aCalculated X^2 value = 7.60. Critical X^2 value for .05 level of significance with 4 df = 9.49. Not significant at .05 level.

These comparisons indicate a slight positive association between planting at the recommended rate and higher yields of soybeans. The Chi square value did not achieve the level ($P < .05$) selected for testing, but did reach the .20 level of significance.

Relation of Soybean Yields to Variety of Soybeans Planted

Data in Table XXV reveal that 29 percent of all producers planted Ogden soybeans only, and that while 35 percent of the High yield group planted this variety only, 24 percent of the Low yield group did so. Seventy-one percent planted at least some Ogden soybeans.

Eighteen percent of all producers planted a combination of Ogden-Lee-Hill varieties. Seventeen percent of the High yield group planted this combination and 19 percent of the Low yield group did so. Smaller percents planted other varieties and combinations of varieties.

The Chi square value was not significant, thus no positive association was shown between varieties of soybeans and yields. All varieties planted were varieties recommended by The University of Tennessee Agricultural Extension Service.

Relation of Number of Seeds Planted Per Foot of Row and Yields

It will be noted from Table XXXVI that 66 percent of all producers planted within the range of 6 to 14 seed per foot of row, and the remaining 34 percent planted from 15 to 20 seed per foot of row.

It is interesting to note that 71 percent of the Low yield group planted 6 to 14 seed per foot of row, while 59 percent of the High yield group planted at this rate. Forty-one percent of the High group planted at higher rates (15 to 20 seed per foot of row), as compared to 29

TABLE XXXV
RELATIONS OF AVERAGE TWO-YEAR (1968 AND 1969) SOYBEAN YIELDS
PRODUCED TO VARIETY OF SOYBEANS PLANTED BY
MARION COUNTY PRODUCERS^a

Variety of Seed Planted	Yield Groups (Bushels per Acre)		
	Total (N=38) Percent	High Yield (N=17) Percent	Low Yield (N=21) Percent
Ogden	29	35	24
Hill	5	6	5
Hood	3	6	0
Hill-Hood	5	6	5
Ogden-Hill	8	6	9
Ogden-Lee	11	6	14
Ogden-Hood	5	6	5
Ogden-Lee-Hill	18	17	19
Other combinations	16	12	19
Total	100.0	100.0	100.0

^aCalculated X^2 value = 3.05. Critical X^2 value for .05 level of significance with 8 df = 15.51. Not significant at .05 level.

TABLE XXXVI

RELATIONS OF AVERAGE TWO-YEAR (1968 AND 1969) SOYBEAN YIELDS
 PRODUCED TO NUMBER OF SEEDS PLANTED PER FOOT
 OF ROW BY MARION COUNTY PRODUCERS^a

Number of Seed Planted Per Foot of Row	Yield Groups (Bushels per Acre)		
	Total (N=38) Percent	High Yield (N=17) Percent	Low Yield (N=21) Percent
6 - 14	66	59	71
15 - 20	34	41	29
Total	100.0	100.0	100.0

^aCalculated X^2 value = .66. Critical X^2 value for .05 level of significance with 1 df = 3.84. Not significant at .05 level.

percent of the Low yield group. These comparisons indicate a very slight tendency for the higher rate listed here to be associated with higher yields. However, the Chi square value did not achieve the level ($P < .05$) of probability selected for testing.

Relation of Number of Plants Per Foot of Row at Harvest and Yields

Perusal of data in Table XXXVII shows that 37 percent of the 38 soybean producers reported having from 4 to 9 plants per foot of row at harvest, and the remaining 63 percent had from 10 to 18 plants per foot of row.

Eighty-two percent of the High yield group had from 10 to 18 plants per foot of row at harvest, while only 48 percent of the Low yield group did so. The Chi square value reached the level of significance ($P < .05$) selected for testing, indicating a positive relation between higher yields of soybeans and number of plants per foot of row.

Relation of Depth of Planting and Yields

All producers planted seed at the recommended depth (from 3/4 inch to 2 inches), depending on soil and moisture conditions. The relation between depth of planting and yields was not a significant one (see Table XXXVIII).

Relation of Use of Soil Testing and Yields

Seventy-four percent of the 38 soybean producers had fertilized and limed their fields according to soil test recommendations, although most indicated that they had their soil tested only every three or four years. Seventy-six percent of the Low yield group had followed this practice, as compared to 70 percent of the High yield group. This would

TABLE XXXVII

RELATIONS OF AVERAGE TWO-YEAR (1968 AND 1969) SOYBEAN YIELDS
 PRODUCED TO NUMBER OF PLANTS PER FOOT OF ROW
 AT HARVEST BY MARION COUNTY PRODUCERS^a

Number of Plants per Foot of Row at Harvest ^b	Yield Groups (Bushels per Acre)		
	Total (N=38) Percent	High Yield (N=17) Percent	Low Yield (N=21) Percent
4 - 9	37	18	52
10 - 18	63	82	48
Total	100.0	100.0	100.0

^aCalculated X^2 value = 4.87. Critical X^2 value for .05 level of significance with 1 df = 3.84.

^bSignificant at .05 level of probability.

TABLE XXXVIII

RELATIONS OF AVERAGE TWO-YEAR (1968 AND 1969) SOYBEAN YIELDS
 PRODUCED TO HOW DEEP SOYBEANS WERE PLANTED BY
 MARION COUNTY PRODUCERS^a

Depth of Planting	Yield Groups (Bushels per Acre)		
	Total (N=38) Percent	High Yield (N=17) Percent	Low Yield (N=21) Percent
3/4 inch to 1 inch	26	29	24
1-1/2 inches	58	53	62
2 inches	16	18	14
Total	100.0	100.0	100.0

^aCalculated X^2 value = .31. Critical X^2 value for .05 level of significance with 2 df = 5.99. Not significant at .05 level.

seem to indicate a slight negative relation concerning this recommended practice and yields, though the Chi square value was not significant (see Table XXXIX).

Relation of Most Recent Year Soybean Land Was Tested and Yields

Fifty-five percent of the 38 soybean producers had tested their soil no later than 1967, while the remaining 45 percent had used this practice in 1969. Forty-seven percent of the High yield group had tested their soil in 1969 as compared to 43 percent of the Low yield group (see Table XL). The Chi square value was not significant.

Relation of Use of Molybdenum When Needed and Yields

Table XLI reveals that 40 percent of all producers had used Molybdenum when the soil was below 6.0 and the land had not been limed, while 23 percent had not used this recommended practice.

Forty-seven percent of the High yield group had followed the practice, as compared to 33 percent of the Low yield group. These comparisons suggest a slight positive relation of use of Molybdenum as needed and higher yields. However, the Chi square value did not achieve the level ($P < .05$) of probability, so the relation cannot be verified.

Relation of Use of Lime If Needed and Yields

Table XLII shows that only 8 percent of the 38 producers said lime had been applied as needed, and 32 percent said that lime had not been applied, though needed.

However, 10 percent of the Low yield group said lime had been applied when needed, as compared to only 6 percent of the High yield group. Twenty-nine percent of the High yield group and 33 percent of

TABLE XXXIX

RELATIONS OF AVERAGE TWO-YEAR (1968 AND 1969) SOYBEAN YIELDS
 PRODUCED TO WHETHER SOYBEAN LAND HAD BEEN TESTED BY
 MARION COUNTY PRODUCERS^a

Soybean Land Had Been Tested	Yield Groups (Bushels per Acre)		
	Total (N=38) Percent	High Yield (N=17) Percent	Low Yield (N=21) Percent
Yes	74	70	76
No	26	30	24
Total	100.0	100.0	100.0

^aCalculated X^2 value = .15. Critical X^2 value for .05 level of significance with 1 df = 3.84. Not significant at .05 level.

TABLE XL

RELATIONS OF AVERAGE TWO-YEAR (1968 AND 1969) SOYBEAN YIELDS
 PRODUCED AND MOST RECENT YEAR SOYBEAN LAND WAS TESTED
 ACCORDING TO MARION COUNTY PRODUCERS^a

Most Recent Year Soybean Land Was Tested	Yield Groups (Bushels per Acre)		
	Total (N=38) Percent	High Yield (N=17) Percent	Low Yield (N=21) Percent
1967	55	53	57
1969	45	47	43
Total	100.0	100.0	100.0

^aCalculated X^2 value = .07. Critical X^2 value for .05 level of significance with 1 df = 3.84. Not significant at .05 level.

TABLE XLI

RELATIONS OF AVERAGE TWO-YEAR (1968 AND 1969) SOYBEAN YIELDS
 PRODUCED TO WHETHER MOLY WAS USED, IF pH WAS UNDER 6.0,
 BY MARION COUNTY PRODUCERS^a

Moly was used when pH was under 6.0	Yield Groups (Bushels per Acre)		
	Total (N=38) Percent	High Yield (N=17) Percent	Low Yield (N=21) Percent
Does not apply ^b	37	29	43
Yes	40	47	33
No	23	24	24
Total	100.0	100.0	100.0

^aCalculated X^2 value = .96. Critical X^2 value for .05 level of significance with 2 df = 5.99. Not significant at .05 level.

^bIncludes those producers who had not tested their soils and those producers who had soil pH levels above 6.0.

TABLE XLII

RELATION OF AVERAGE TWO-YEAR (1968 AND 1969) SOYBEAN YIELDS
PRODUCED TO WHETHER LIME WAS APPLIED, IF pH WAS UNDER
6.0, BY MARION COUNTY PRODUCERS^a

Lime was applied when pH was under 6.0	Yield Groups (Bushels per Acre)		
	Total (N=38) Percent	High Yield (N=17) Percent	Low Yield (N=21) Percent
Does not apply ^b	50	65	57
Yes	8	6	10
No	32	29	33
Total	100.0	100.0	100.0

^aCalculated X^2 value = .28. Critical X^2 value for .05 level of significance with 2 df = 5.99. Not significant at .05 level.

^bIncludes those producers who had not tested their soils and those producers who had soil pH levels above 6.0.

the Low indicated that lime had not been applied, though needed. The Chi square value did not achieve level ($P < .05$) of probability selected for testing, though it did reach the .20 level of confidence.

Relation of Amount and Analysis of Fertilizer Applied and Yields

Table XLIII shows that 18 percent of all producers did not use any fertilizer. Thirty-eight percent applied fertilizer containing nitrogen, even though nitrogen is not recommended. Twenty-one percent had fertilized the crop heavily the preceding year and did not apply any fertilizer to produce soybeans.

Twenty-three percent of the High yield group, and 14 percent of the Low did not use any fertilizer for soybeans. Twenty-three percent of the High yield group had fertilized the preceding crop heavily, as compared to 19 percent of the Low yield group. Forty-eight percent of the High yield group applied fertilizer containing nitrogen, while 43 percent of the Low yield group did so. The Chi square value was not significant at the level selected for testing, thus no relation was shown between use of fertilizer and yields.

Relation of Amount of Actual Nutrients Used and Yields

Study of Table XLIV shows that 19 percent of all soybean producers did not apply any fertilizer. Twenty-one percent had fertilized a previous crop heavily. Thirty-four percent applied from 70 to 120 pounds of nutrients (NPK), and 21 percent applied from 45 to 60 pounds.

Twenty-three percent of the High yield group did not use any fertilizer, as compared to 14 percent of the Low yield group. Eighteen percent of the High yield group applied 45 to 60 pounds of plant nutrients

TABLE XLIII

RELATIONS OF AVERAGE TWO-YEAR (1968 AND 1969) SOYBEAN YIELDS
PRODUCED TO AMOUNT AND ANALYSIS OF FERTILIZER USED BY
MARION COUNTY PRODUCERS^a

Fertilizer Used Amount (lbs.)	Analysis	Yield Group (Bushels per Acre)		
		Total (N=38) Percent	High Yield (N=17) Percent	Low Yield (N=21) Percent
Did Not Fertilize		18	23	14
100-200	6-12-12	16	12	19
200-250	4-12-12	16	6	24
200-400	0-20-20	10	12	9
100	0-0-60	5	6	5
200	33-0-0-and 10-20-20	3	6	0
100 300	0-0-60 and 10-20-20	2	6	0
Did not fertilize, but heavily fertilized preceding year		21	23	19
Total		100.0	100.0	100.0

^aCalculated X^2 value = 5.95. Critical X^2 value for .05 level of significance with 8 df = 15.51. Not significant at .05 level.

TABLE XLIV
 RELATIONS OF AVERAGE TWO-YEAR (1968 AND 1969) SOYBEAN YIELDS
 PRODUCED TO ACTUAL PLANT NUTRIENTS USED BY
 MARION COUNTY PRODUCERS^a

Pounds of Actual Plant Nutrients (NPK) Used	Yield Group (Bushels per Acre)		
	Total (N=38) Percent	High Yield (N=17) Percent	Low Yield (N=21) Percent
Did not fertilize	19	23	14
45 - 60	21	18	24
70 - 120	34	12	0
166 - 210	5	12	0
Did not fertilize, but heavily fertilized year preceding soybeans	21	23	19
Total	100.0	100.0	100.0

^aCalculated X^2 value = 3.77. Critical X^2 value for .05 level of significance with 4 df = 9.49. Not significant at .05 level.

(NPK), while 24 percent of the Low yield group fertilized at this rate. Twenty-four percent of the High yield group used from 70 to 210 pounds of nutrients, while none of the Low yield group applied at this rate, which in general is more than the recommended rate. Twenty-three percent of the High yield group and 19 percent of the Low heavily fertilized the preceding crop.

These comparisons show no consistent relation between fertilization rates and yields. The Chi square value was not significant.

Relation of Amount of Nitrogen Applied and Yields

It will be seen from Table XLV that 55 percent of the 38 soybean producers did not use any nitrogen. Thirty-three percent applied from 6 to 12 pounds of nitrogen, 10 percent applied 30 pounds and 2 percent used as high as 86 pounds.

Sixty-four percent of the High yield group did not use any nitrogen, as compared to 48 percent of the Low yield group. Fifty-two percent of the Low yield group used from 6 to 30 pounds of nitrogen, while 36 percent of the High yield group applied from 6 to 86 pounds of nitrogen. It should be remembered that the percents of producers using no nitrogen included those that had fertilized the preceding crop heavily.

These comparisons show no consistent relation of use of nitrogen and yield of soybeans. The Chi square value was not significant.

Relation of Amount of Phosphate Applied and Yields

Table XLVI reveals that 45 percent of all soybean producers did not apply any phosphate fertilizer materials. Thirty-nine percent used from 12 to 30 pounds of phosphate and 16 percent applied from 40 to 80 pounds.

TABLE XLV
RELATIONS OF AVERAGE TWO-YEAR (1968 AND 1969) SOYBEAN YIELDS
PRODUCED TO AMOUNT OF NITROGEN USED BY
MARION COUNTY PRODUCERS^a

Pounds of Actual Nitrogen (N) Used	Yield Group (Bushels per Acre)		
	Total (N=38) Percent	High Yield (N=17) Percent	Low Yield (N=21) Percent
0	54	64	48
6-12	33	18	42
30	10	12	10
86	3	6	0
Total	100.0	100.0	100.0

^aCalculated X^2 value = 3.40. Critical X^2 value for .05 level of significance with 3 df = 7.82. Not significant at .05 level.

TABLE XLVI
 RELATIONS OF AVERAGE TWO-YEAR (1968 AND 1969) SOYBEAN YIELDS
 PRODUCED TO AMOUNT OF PHOSPHATE USED BY
 MARION COUNTY PRODUCERS^a

Pounds of Actual Phosphate (P ₂ O ₅) Used	Yield Group (Bushels per Acre)		
	Total (N=38) Percent	High Yield (N=17) Percent	Low Yield (N=21) Percent
0	45	52	38
12 - 30	39	24	52
40 - 80	16	24	10
Total	100.0	100.0	100.0

^aCalculated X² value = 3.64. Critical X² value for .05 level of significance with 2 df = 5.99. Not significant at .05 level.

Fifty-two percent of the High yield group used no phosphate, as compared to 38 percent of the Low yield group. It will be remembered that these percents included those producers which heavily fertilized the preceding crop. Sixty-two percent of the Low yield group applied from 12 to 80 pounds of phosphate, while only 48 percent of the High yield group had used this much. Higher percents (52 compared to 24) of the Low yield group used a range of 12 to 30 pounds of phosphate, while the opposite was true concerning the higher range (40 to 80 pounds) of phosphate (24 percent of the High compared to 10 percent of the Low group).

These comparisons indicate that soybeans may not consistently respond to applications of phosphate fertilizer. The Chi square value was not significant for the level ($P < .05$) of probability selected for testing, though it did achieve the .20 level.

Relation of Amount of Potash Applied and Yields

The data in Table XLVII reveal that 40 percent of all soybean producers interviewed did not use any potash. Forty percent applied from 12 to 30 pounds, 18 percent from 40 to 80 pounds and one producer applied 120 pounds of actual potash.

Forty-seven percent of the High yield group did not use any potash, as compared to 33 percent of the Low yield group. However, these percents include those producers who had heavily fertilized the preceding crop.

Sixty-seven percent of the Low yield group applied from 12 to 80 pounds of potash, as compared to 48 percent of the Low yield group. Higher percents of the Low yield group used from 12 to 30 pounds of potash (53 vs 24 percent), while higher percents of the High yield group

TABLE XLVII

RELATIONS OF AVERAGE TWO-YEAR (1968 AND 1969) SOYBEAN YIELDS
 PRODUCED TO AMOUNT OF POTASH USED BY
 MARION COUNTY PRODUCERS^a

Pounds of Actual Potash (K ₂ O) Used	Yield Group (Bushels per Acre)		
	Total (N=38) Percent	High Yield (N=17) Percent	Low Yield (N=21) Percent
0	40	47	33
12 - 30	40	24	53
40 - 80	18	24	14
120	2	5	0
Total	100.0	100.0	100.0

^aCalculated X^2 value = 4.06. Critical X^2 value for .05 level of significance with 3 df = 7.82. Not significant at .05 level.

(24 vs 14 percent) used from 40 to 80 pounds of potash. One producer in the High yield group applied 120 pounds of potash.

These comparisons seem to indicate that soybeans may not respond to application of potash fertilizer consistently. The Chi square value was not significant at the level ($P < .05$) of significance selected for testing. However, it did achieve the .30 level.

Relation of Number of Times Cultivated and Yields

Three percent of the 38 soybean producers did not answer the question concerning the number of times they had cultivated (see Table XLVIII). Thirty-nine percent had cultivated one time, 40 percent twice and 10 percent three times.

Five percent of the Low yield group did not answer the question concerning the number of times they had cultivated. Higher percents of the High yield group had cultivated one time (47 vs 33 percent). Slightly higher percents of the High yield group had cultivated two and three times. These comparisons do not show a consistent relation of number of times soybeans are cultivated and yield. The Chi square value was not significant.

Relation of Use of Pre-Emerge Herbicides and Yields

Thirty-seven percent of the 38 soybean producers did not answer the question concerning the use of pre-emergence herbicides. Three percent (one producer) did use this practice and 60 percent did not.

High percents of both yield groups did not answer the question (see Table XLIX), high percents of both indicated that they did not use the practice, and only one producer said he was using the practice. No

TABLE XLVIII

RELATIONS OF AVERAGE TWO-YEAR (1968 AND 1969) SOYBEAN YIELDS
 PRODUCED AND NUMBER OF TIMES CULTIVATED BY
 MARION COUNTY PRODUCERS^a

Number of Times Soybeans Were Cultivated	Yield Groups (Bushels per Acre)		
	Total (N=38) Percent	High Yield (N=17) Percent	Low Yield (N=21) Percent
Not answered	3	0	5
Does not apply (broadcast)	8	0	14
One time	39	47	33
Two times	40	41	38
Three times	10	12	10
Total	100.0	100.0	100.0

^aCalculated X^2 value 3.75. Critical X^2 value for .05 level of significance with 4 df = 11.07. Not significant at .05 level.

TABLE XLIX

RELATIONS OF AVERAGE TWO-YEAR (1968 AND 1969) SOYBEAN YIELDS
 PRODUCED AND WHETHER A PRE-EMERGENT HERBICIDE WAS USED
 BY MARION COUNTY PRODUCERS^a

Used Pre-emergent Herbicide	Yield Groups (Bushels per Acre)		
	Total (N=38) Percent	High Yield (N=17) Percent	Low Yield (N=21) Percent
Not answered	37	47	29
Yes	3	6	0
No	60	47	71
Total	100.0	100.0	100.0

^aCalculated X^2 value = 3.03. Critical X^2 value for .05 level of significance with 2 df = 5.99. Not significant at .05 level.

significant relation was shown between use of pre-emergence herbicides and yields. The Chi square value was not significant.

Relation of Use of Post-Emerge Herbicides and Yields

Thirty-four percent of the 38 soybean producers did not answer the question concerning the use of post-emergence herbicides. Thirteen percent indicated they did use this practice and 53 percent said they did not use the practice (see Table L).

Forty-one percent of the High yield group did not answer the question, as compared to 29 percent of the low yield group. Twelve percent of the High yield group did use post-emergent herbicides, as did 14 percent of the Low yield group.

The Chi square value was not significant. Thus, no relation was shown between use of post-emergence herbicides and yields.

Relation of Effectiveness of Weed Control and Yields

Forty-seven percent of the 38 soybean producers stated they had obtained good weed control, and 32 percent felt weed control results were excellent. Eighteen percent rated their weed control as only fair and 3 percent rated their weed control as poor (see Table LI).

The data show essentially no difference between High and Low yield groups concerning the effectiveness of their weed control efforts. The Chi square value was not significant. Thus, no relation seemed to exist between effectiveness of weed control and yields.

Relation of Effectiveness of Insect Control and Yields

Study of Table LII reveals that there seemed to be no essential difference in effectiveness of insect control between the two yield

TABLE L
 RELATIONS OF AVERAGE TWO-YEAR (1968 AND 1969) SOYBEAN YIELDS
 PRODUCED AND WHETHER A POST-EMERGENT HERBICIDE WAS USED
 BY MARION COUNTY PRODUCERS^a

Used Post-emergent Herbicide	Yield Groups (Bushels per Acre)		
	Total (N=38) Percent	High Yield (N=17) Percent	Low Yield (N=21) Percent
Not answered	34	41	29
Yes	13	12	14
No	53	47	57
Total	100.0	100.0	100.0

^aCalculated X^2 value = .66. Critical X^2 value for .05 level of significance with 2 df = 5.99. Not significant at .05 level.

TABLE LI
RELATIONS OF AVERAGE TWO-YEAR (1968 AND 1969) SOYBEAN YIELDS
PRODUCED AND EFFECTIVENESS OF WEED CONTROL
BY MARION COUNTY PRODUCERS^a

Effectiveness of Weed Control	Yield Groups (Bushels per Acre)		
	Total (N=38) Percent	High Yield (N=17) Percent	Low Yield (N=21) Percent
Excellent	32	29	33
Good	47	47	48
Fair	18	18	19
Poor	3	6	0
Total	100.0	100.0	100.0

^aCalculated X^2 value = 1.29. Critical X^2 value for .05 level of significance with 3 df = 7.82. Not significant at .05 level.

TABLE LII
 RELATIONS OF AVERAGE TWO-YEAR (1968 AND 1969) SOYBEAN YIELDS
 PRODUCED AND EFFECTIVENESS OF INSECT CONTROL BY
 MARION COUNTY PRODUCERS^a

Effectiveness of Insect Control	Yield Groups (Bushels per acre)		
	Total (N=38) Percent	High Yield (N=17) Percent	Low Yield (N=21) Percent
Excellent	21	24	19
Good	24	29	19
Fair	47	41	52
Poor	8	6	10
Total	100.0	100.0	100.0

^aCalculated X^2 value = .92. Critical X^2 value for .05 level of significance with 3 df = 7.82. Not significant at .05 level.

groups. All producers indicated that they had not used any control measures. The percents shown only reflect the opinions of the producers concerning the amount of insect damage they had experienced. Thus, no comparison of insect control measures could be made.

Relation of Seed Inoculation and Yields

Table LIII reveals that 66 percent of the 38 soybean producers inoculated their soybean seed when necessary. Seventy-seven percent of the High yield group inoculated soybean seed, while only 57 percent of the Low yield group used this recommended practice. These comparisons indicate a slight positive relation between inoculation of seed and yields of soybeans. The Chi square value was not significant at the level ($P < .05$) selected for testing, though it did reach the .30 level of confidence.

Relation of Number of Days After Soybeans Emerged and Start of Cultivation and Yields

Seventy-seven percent of the 38 soybean producers started cultivation from 8 to 15 days after the soybeans emerged. Eleven percent started sooner than 8 days and 12 percent started later than 14 days (see Table LIV).

It will be noted that 22 percent of the High yield group started cultivation sooner than eight days, as compared to only 5 percent of the Low yield group. Eighty-six percent of the Low yield group started cultivation from 8 to 15 days after soybeans emerged, while only 64 percent started cultivation at this time. However, 14 percent of the High yield group started cultivation from 15 to 22 days after soybeans emerged, as compared to only 8 percent of the Low yield group.

TABLE LIII

RELATIONS OF AVERAGE TWO-YEAR (1968 AND 1969) SOYBEAN YIELDS
 PRODUCED AND WHETHER SEED USED HAD BEEN INOCULATED BY
 MARION COUNTY PRODUCERS^a

Seed Had Been Inoculated	Yield Groups (Bushels per Acre)		
	Total (N=38) Percent	High Yield (N=17) Percent	Low Yield (N=21) Percent
Yes	66	77	57
No	34	23	43
Total	100.0	100.0	100.0

^aCalculated X^2 value = 1.56. Critical X^2 value for .05 level of significance with 1 df = 3.84. Not significant at .05 level.

TABLE LIV

RELATIONS OF AVERAGE TWO-YEAR (1968 AND 1969) SOYBEAN YIELDS
 PRODUCED AND NUMBER OF DAYS AFTER SOYBEANS WERE UP BEFORE
 CULTIVATION WAS STARTED BY MARION COUNTY PRODUCERS^a

Number of Days After Soybeans Were Up Before Cultivation	Yield Group (Bushels per Acre)		
	Total (N=38) Percent	High Yield (N=17) Percent	Low Yield (N=21) Percent
1 - 7	11	22	5
8 - 14	77	64	86
15 - 22	12	14	9
Total	100.0	100.0	100.0

^aCalculated X^2 value = 2.71. Critical X^2 value for .05 level of significance with 2 df = 5.99. Not significant at .05 level.

These comparisons indicate a slight tendency toward a positive association between cultivation soon after soybeans emerge and yields produced. However, the relation did not reach the level ($P < .05$) selected for testing. It did reach the .30 level of significance.

Relation of Dockage on Soybeans Sold and Yields

The data in Table LV show that 74 percent of the 38 soybean producers had received dockage on soybeans. Seventy-six percent of the Low yield group had received dockage, while 71 percent of the High yield group had received dockage. These comparisons indicate that high percents of all soybean producers had received dockage, with no significant differences between the two yield groups. The Chi square value was not significant.

Relation of Lodging and Yields

Sixty-eight percent of the 38 soybean producers stated that lodging was not a problem (see Table LVI).

In comparing the two yield groups it will be noted that 77 percent of the High yield group stated that lodging was not a problem, as compared to 62 percent of the Low yield group. This comparison indicates a slight positive relation between lodging and lower yields of soybeans. However, the Chi square value did not reach the level ($P < .05$) of probability selected for testing.

Relation of Things Liked Most About Soybean Production and Yields

Reference to Table LVII shows that 29 percent of the 38 soybean producers said that the one thing they liked most about soybean production was that it was an easy crop to grow and/or harvest. The next

TABLE LV

RELATIONS OF AVERAGE TWO-YEAR (1968 AND 1969) SOYBEAN YIELDS
 PRODUCED AND WHETHER DOCKAGE ON SOYBEANS SOLD WAS
 RECEIVED BY MARION COUNTY PRODUCERS^a

Dockage Received on Soybeans Sold	Yield Group (Bushels per Acre)		
	Total (N=38) Percent	High Yield (N=17) Percent	Low Yield (N=21) Percent
Yes	74	71	76
No	26	29	24
Total	100.0	100.0	100.0

^aCalculated X^2 value = .15. Critical X^2 value for .05 level of significance with 1 df = 3.84. Not significant at .05 level.

TABLE LVI

RELATIONS OF AVERAGE TWO-YEAR (1968 AND 1969) SOYBEAN YIELDS
PRODUCED AND WHETHER LODGING WAS A PROBLEM FOR
MARION COUNTY PRODUCERS^a

Was Lodging a Problem	Yield Groups (Bushels per Acre)		
	Total (N=38) Percent	High Yield (N=17) Percent	Low Yield (N=21) Percent
Yes	32	23	38
No	68	77	62
Total	100.0	100.0	100.0

^aCalculated X^2 value = .92. Critical X^2 value for .05 level of significance with 1 df = 3.84. Not significant at .05 level.

TABLE LVII

RELATIONS OF AVERAGE TWO-YEAR (1968 AND 1969) SOYBEAN YIELDS
 PRODUCED TO THINGS LIKED MOST ABOUT SOYBEAN PRODUCTION
 MENTIONED BY MARION COUNTY PRODUCERS^a

Things Liked Most About Soybean Production	Yield Groups (Bushels per Acre)		
	Total (N=38) Percent	High Yield (N=17) Percent	Low Yield (N=21) Percent
Easy to grow and/or harvest	29	35	24
Good cash crop	26	23	29
Low labor requirements and low overall production costs	13	12	14
Low capital requirements	11	12	9
Good cash crop and good crop for farm rotation	8	12	5
Will stand dry and/or wet seasons	5	6	5
Dependable and ready market	5	0	9
Adaptable to land not suited for other crops	3	0	5
Total	100.0	100.0	100.0

^aCalculated X^2 value = 3.70. Critical X^2 value for .05 level of significance with 7 df = 14.07. Not significant at .05 level.

largest group, 26 percent, stated that it was a good cash crop. Smaller numbers of producers gave other reasons for liking soybean production. Twenty-three percent of the High yield group and 29 percent of the Low yield group liked soybean production because they considered soybeans a good cash crop. Small percents of producers mentioned the other reasons listed in Table LVII. The calculated Chi square value was not significant. No apparent relation existed between things liked most about soybean production and yields.

Relation of Things Disliked Most About Soybean Production and Yields

One-half of the 38 soybean producers (53 percent of the High and 47 percent of the Low yield groups) gave weed control as the one thing they disliked most about soybean production (see Table LVIII). The next largest group, 23 percent of all producers, listed low yields and low net income and/or prices. Smaller percents listed other dislikes. It is interesting to note that 10 percent of producers stated that they had no dislikes about soybean production. Further, 14 percent of the Low yield group had no dislikes, while only 6 percent of the High yield group so reported. Twenty-nine percent of the High yield group gave low yields and low net income and/or prices as the one thing they disliked most about soybean production, as compared to only 19 percent of the Low yield group. Other than these comparisons there seemed to be little relation of soybean yields produced to things disliked about soybean production. The Chi square value did not reach the level of significance ($P < .05$) selected for testing.

TABLE LVIII

RELATIONS OF AVERAGE TWO-YEAR (1968 AND 1969) SOYBEAN YIELDS
 PRODUCED TO THINGS DISLIKED MOST ABOUT SOYBEAN PRODUCTION
 MENTIONED BY MARION COUNTY PRODUCERS^a

Things Disliked Most About Soybean Production	Yield Groups (Bushels per acre)		
	Total (N=38) Percent	High Yield (N=17) Percent	Low Yield (N=21) Percent
Weed control problem	50	53	47
Low yields and low net income and/or prices	23	29	19
No dislikes	10	6	14
Price and profit vary too much and controlled prices	5	6	5
Grading system at market	3	6	0
Conflict in double cropping	3	0	5
Low yield and low net income	3	0	5
Low yields and weeds	3	0	5
Total	100.0	100.0	100.0

^aCalculated X^2 value = 5.24. Critical X^2 value for .05 level of significance with 7 df = 14.07. Not significant at .05 level.

Relation of Soybean Yields Produced and Reasons for Not Having Plans for the Future

Sixty-eight percent of the 38 soybean producers did not answer the question concerning plans for future soybean production. Fewer of the High yield group (64 percent) indicated they had no plans for the future than was true for the Low (72 percent) group (see Table LVIX).

It will be noted that 19 percent of the Low yield group stated they expected to decrease their acreage of soybeans, as compared to 12 percent of the High yield group.

No producers in the Low yield group stated they were satisfied with their soybean production, while one producer in the High yield group was satisfied. The Chi square value was not significant. Therefore, no relation appeared to exist between reasons for no plans and yield.

Relation of Sources of Advice and Yields

Table LX reveals that 87 percent of the 38 soybean producers sought advice from their neighbors and friends concerning soybean production. Eighty-two percent sought advice from soybean buyers and seed, fertilizer or pesticide dealers. Sixty-six percent sought advice from equipment dealers, 61 percent from Extension Agents, 40 percent from a Soil Conservation Service representative, 32 percent from an Extension Service soybean specialist, 24 percent from a Farmers Home Administration representative, and 16 percent from a banker or Production Credit Association representative, among others. Thus, Extension Agents did rank as an important source of information on production practices for soybean producers in Marion County.

TABLE LVIX

RELATIONS OF AVERAGE TWO-YEAR (1968 AND 1969) SOYBEAN YIELDS
 PRODUCED TO REASONS FOR NOT HAVING PLANS FOR FUTURE
 BY MARION COUNTY PRODUCERS^a

Reasons for Not Having Plans for Future Soybean Production	Yield Group (Bushels per Acre)		
	Total (N=38) Percent	High Yields (N=17) Percent	Low Yield (N=21) Percent
No plans	68	64	72
Decreasing soybean production	16	12	19
Is discontinuing soybean production, grower is in poor health	8	6	9
Soybeans do not fit most land on farm	5	12	0
Satisfied with present operation	3	6	0
Total	100.0	100.0	100.0

^aCalculated X^2 value = 4.14. Critical X^2 value for .05 level of significance with 4 df = 9.49. Not significant at .05 level.

TABLE LX

RELATIONS OF AVERAGE TWO-YEAR (1968 AND 1969) SOYBEAN YIELDS
 PRODUCED TO SOURCES OF ADVICE ON SOYBEAN PRODUCTION
 AND MARKETING BY MARION COUNTY PRODUCERS

Persons From Whom Advice Was Sought	Yield Groups (Bushels per Acre)		
	Total (N=38) Percent	High Yield (N=17) Percent	Low Yield (N=21) Percent
Neighbor or friend	87	88	86
Seed, fertilizer, or pesticide dealer	82	88	76
Soybean buyer	82	76	86
Equipment dealer	66	65	67
Extension agent	61	59	62
SCS representative	40	41	38
Soybean specialist	32	35	29
FHA representative	24	29	19
Banker or PCA representative	16	23	10
Others	0	0	0

Sixty-two percent of the Low yield group sought advice from Extension Agents, as compared to 59 percent of the High yield group. Other comparisons between High and Low yield groups show essentially no difference in advice sought from neighbors and friends, equipment dealers, and Soil Conservation Service representatives. Higher percents of the High than the Low yield group had sought the advice of an Extension Soybean Specialist (35 and 29 percent, respectively); seed, fertilizer, or pesticide dealer (88 and 76 percent, respectively); banker or Production Credit Association representative (23 and 10 percent, respectively); and Farmers Home Administration representative (29 and 19 percent, respectively). Eighty-six percent of the Low yield group sought advice from soybean buyers, while 76 percent of the High yield group also sought advice from this source.

Extension Agents ranked fifth as a source of advice for both the High and Low yield groups. A statistical analysis of the findings in this table was not attempted, since most soybean producers listed more than one source of advice on soybean production practices.

Relation of Sources of Information and Yields

Table XLI reveals that 92 percent of the 38 soybean producers gained information from Extension newsletters and Extension bulletins and publications, 95 percent from farm magazines, 82 percent from monthly or other newspapers (includes Marion County Farm Progress, a monthly newspaper edited by Extension Agents), 76 percent from radio programs presented by Extension Agents, 71 percent weekly newspapers and farm meetings, 68 percent from commercial bulletins, 55 percent from daily

TABLE LXI

RELATIONS OF AVERAGE TWO-YEAR (1968 AND 1969) SOYBEAN YIELDS
 PRODUCED TO SOURCES OF INFORMATION ON SOYBEAN PRODUCTION
 AND MARKETING BY MARION COUNTY PRODUCERS

Sources of Information	Yield Groups (Bushels per Acre)		
	Total (N=38) Percent	High Yield (N=17) Percent	Low Yield (N=21) Percent
Farm magazines	94	100.0	90
Extension bulletins and publications	92	100.0	86
Monthly or other newspapers	82	94	71
Radio	76	71	81
Weekly newspapers	71	82	62
Farm meetings	71	71	71
Commercial bulletins	68	65	71
Daily newspapers	55	65	48
Field days or tours	50	41	57
Television	13	12	14
Extension newsletters	92	100	86

newspapers, 50 percent from field days and tours, and 13 percent from television.

It is interesting to note that 100 percent of the High yield group gained information from Extension newsletters and Extension bulletins and publications, as compared to 86 percent of the Low yield group.

Comparison of the data reveals that higher percents of the High than the Low yield group gained information from farm magazines (100 and 90 percent, respectively); weekly newspapers (82 and 62 percent, respectively); monthly and other newspapers (94 and 71 percent, respectively); and daily newspapers (65 and 62 percent, respectively). Higher percents of the Low than the High yield group gained information from field days and tours (57 and 41 percent, respectively); radio (81 and 71 percent, respectively); commercial bulletins (71 and 65 percent, respectively); and television (14 and 12 percent, respectively).

These comparisons seem to suggest that more of the High than of the Low yield group may have gained information from sources of Extension origin, with the exception of radio and field days and tours.

A statistical analysis of the findings was not made, since most of the soybean producers indicated they sought information from more than one source.

Relation of Ranking of First Most Important Reason for Not Adopting Recommended Practices and Yields

Table LXII reveals that the single most important reason for not adopting recommended production and marketing practices, as stated by farmers, was the lack of adequate machinery and equipment. Forty percent

TABLE LXII

RELATIONS OF AVERAGE TWO-YEAR (1968 AND 1969) SOYBEAN YIELDS
 PRODUCED AND RANKING OF FIRST MOST IMPORTANT REASON FOR
 NOT ADOPTING RECOMMENDED PRODUCTION AND MARKETING
 PRACTICES AS REPORTED BY MARION
 COUNTY PRODUCERS^a

First Most Important Reason for Not Adopting Recommended Practices ^b	Yield Groups (Bushels per Acre)		
	Total (N=38) Percent	High Yield (N=17) Percent	Low Yield (N=21) Percent
Lack adequate machinery and equipment	40	35	43
Don't have technical knowledge needed	21	41	5
The cost of the practice outweighs the benefits	13	18	9
More rewarding activities claim owner's time and money	13	0	24
Don't believe practices are sound	8	6	10
Tried practices and found them unsatisfactory	5	0	9
Total	100.0	100.0	100.0

^aCalculated X^2 value = 13.24. Critical X^2 value for .05 level of significance with 5 df = 11.07.

^bSignificant at .05 level.

of the 38 soybean producers ranked this reason first. Forty-three percent of the Low yield group ranked this reason first, as compared to 35 percent of the High yield group.

It will be noted that 41 percent of the High yield group ranked--"Don't have technical knowledge needed"--first, as compared to only 5 percent of the Low yield group. Also, 24 percent of the Low yield group ranked--"More rewarding activities claim owners' time and money"--first, while none of the High yield group ranked this reason first.

Nine Percent of the Low yield group ranked--"Tried practices and found them unsatisfactory"--first, while none of the High yield group ranked this question first.

A significant relation ($P < .05$) was shown between yield and the first most important reason mentioned by producers as preventing farmers in general from adopting recommended practices. Thus, it would appear that more High yield producers selected "Don't have technical knowledge needed" and "The cost of the practice outweighs the benefits"; while more Low yield producers chose "More rewarding activities claim owner's time and money" and "Tried the practices and found them unsatisfactory."

Relation of Ranking of Second Most Important Reason for Not Adopting Recommended Practices and Yields

It will be noted from Table LXIII that 34 percent of the 38 soybean producers ranked--"The cost of the practice outweighs the benefits"--second, as a reason farmers do not adopt recommended practices. Forty-seven percent of the High yield group ranked this reason second, as compared to 24 percent of the Low yield group.

TABLE LXIII

RELATIONS OF AVERAGE TWO-YEAR (1968 AND 1969) SOYBEAN YIELDS
 PRODUCED AND RANKING OF SECOND MOST IMPORTANT REASON FOR
 NOT ADOPTING RECOMMENDED PRODUCTION AND MARKETING
 PRACTICES AS REPORTED BY MARION
 COUNTY PRODUCERS^a

Second Most Important Reason for Not adopting Recommended Practices	Yield Groups (Bushels per Acre)		
	Total (N=38) Percent	High Yield (N=17) Percent	Low Yield (N=21) Percent
Lack adequate machinery and equipment	21	29	14
Don't have technical knowledge needed	18	12	24
The cost of the practice outweighs the benefits	34	47	24
More rewarding activities claim owner's time and money	13	12	14
Don't believe practices are sound	14	0	24
Tried practices and found them unsatisfactory	0	0	0
Total	100.0	100.0	100.0

^aCalculated X^2 value = 7.34. Critical X^2 value for .05 level of significance with 5 df = 11.07. Not significant at .05 level.

Nineteen percent of the Low yield group ranked--"Don't believe practices are sound"--second, while none of the High yield group did so. No significant relation was noted between yield and second most important reason why farmers were felt not to adopt recommended practices.

Relation of Ranking of Third Most Important Reason for Not Adopting Recommended Practices and Yields

Table LXIV reveals that 24 percent of the 38 soybean producers ranked "The cost of the practice outweighs the benefits"--as the third most important reason farmers do not adopt recommended practices. It is interesting to note that 24 percent of both the High and the Low yield groups also ranked this reason as third most important.

No significant relation was noted between yield and third most important reason why farmers in general were felt not to adopt recommended practices.

TABLE LXIV

RELATIONS OF AVERAGE TWO-YEAR (1968 AND 1969) SOYBEAN YIELDS
 PRODUCED AND RANKING OF THIRD MOST IMPORTANT REASON FOR
 NOT ADOPTING RECOMMENDED PRODUCTION AND MARKETING
 PRACTICES AS REPORTED BY MARION
 COUNTY PRODUCERS^a

Third Most Important Reason for Not Adopting Recommended Practices	Yield Groups (Bushels per Acre)		
	Total (N=38) Percent	High Yield (N=17) Percent	Low Yield (N=17) Percent
Lack adequate machinery and equipment	21	17	24
Don't have technical knowledge needed	16	18	14
The cost of the practice outweighs the benefits	24	24	24
More rewarding activities claim owner's time and money	13	17	9
Don't believe practices are sound	18	12	24
Tried practices and found them unsatisfactory	8	12	5
Total	100.0	100.0	100.0

^aCalculated X^2 value = 2.42. Critical X^2 value for .05 level of significance with 6 df = 12.59. Not significant at .05 level.

CHAPTER V

SUMMARY, IMPLICATIONS, AND RECOMMENDATIONS

I. SUMMARY

Previous to the present study, complete information was not available on yield levels of all Marion County soybean producers. Also, reliable information was not available concerning the use of recommended soybean production practices. It was felt that information was needed and could be utilized by the Agricultural Extension Service staff in the formulation of long time and annual plans of work.

The general purpose of this study, then, was to gather pertinent data that would enable the Extension staff to formulate plans of work based on the most accurate and latest information concerning soybean production in the county. A special interview schedule was developed and used to collect data concerning certain characteristics of soybean producers and their farms, production practices being used, relation of use of recommended production practices and yield levels, and some of the more important factors influencing the adoption of recommended soybean production practices.

A complete list of soybean producers was obtained from the two firms that buy soybeans from Marion County growers. Since the list included only 38 producers, it was decided to interview all growers.

Upon completion of the survey it was found that in 1968, 38 producers harvested soybeans from 3,879 acres, with an average yield of 20.9 bushels per acre. In 1969, 38 producers harvested soybeans from

3,926 acres, with an average yield of 25.7 bushels per acre. A two-year average yield for each grower was computed. Producers were divided into High and Low yield groups for study purposes. Those in the High yield group averaged more than 23.3 bushels per acre, while those in the Low yield group had averages below 23.3 bushels. The range for the High yield group was 24 through 35 bushels per acre, and for the Low yield group the range was from 13 through 23 bushels.

Analyses were done, for the most part, in simple numbers and percents. Practice diffusion ratings and averages were computed for each individual and production groups. Chi square values were calculated to determine significance of relationships where applicable. The .05 level of confidence was selected for testing.

A search for related literature failed to reveal any relevant studies concerning soybean production. Similar studies of other crops were reviewed. Findings in the present study in general, though with exceptions, verified those reported from the similar studies of other crops.

Findings Related to Characteristics of Soybean Producers

A number of summary statements may be made concerning the findings related to selected characteristics of the soybean producers in Marion County.

Survey data did not show a significant relation between major occupation of soybean producers and yields. Fifty-eight percent of the 38 producers were full-time farmers, and the remaining 42 percent were part-time farmers.

Forty-one percent of the High yield group said that soybeans was their major source of income, as compared to only 29 percent of the Low yield group. However, the relation between soybeans as a major source of income and yields was not significant.

In studying the relation of other major sources of income and yield, it was found that 33 percent of the Low yield group listed swine as their major source of income, as compared to only 6 percent of the High yield producers. Eighteen percent of the High yield group indicated dairy as their major source of income, while only 5 percent of the Low yield group did so. The relation was not significant at the level selected for testing, though it did achieve the .30 level of confidence.

Sixty-one percent of the soybean producers had completed grades 10 - 13. Thirty-four percent had completed grades 1 - 9, and 5 percent had an education beyond the high school level. The average educational level for all producers was 9.5 grades. The High yield group educational average was 9.9 grades, as compared to 9.2 grades for the Low yield producers. No significant relation between educational levels and yields was shown by the study.

Fifty-eight percent of all soybean producers were 45 years of age or older. The average was 47.1. The Low yield group had a slightly higher average age (47.9) than did the High yield group (46.8). However, the relation was not significant at the level selected for testing.

The median gross family income for the 79 percent answering this optional question was \$14,375. The 76 percent of the High yield group answering had a higher median gross family income (\$17,499) than did the 81 percent of the Low yield group answering (\$13,333). The relation was not significant, however.

No relation between attitudes of the producers toward the survey and yields, though all were at least "somewhat friendly," was shown. The same was true concerning interest shown by the producers in improvement in their soybean production, though 8 percent of the producers were indifferent.

Ninety-five percent of the Low yield group were considered to be "sooner than average," or higher, on the practice adoption scale. Only 80 percent of the High yield producers were considered to be this high. Though not significant at the level selected for testing, the relation did achieve the .20 level of confidence.

Fifty-three percent of the soybean producers were known "very well" by the interviewer, and only 5 percent were known "not at all." However, no significant relationship between the degree to which producers were known and yield was shown to exist, even though 65 percent of the High yield group were known "very well," as compared to only 43 percent of the Low producers.

Findings Related to Characteristics of the Farms

In general the High yield group had larger farms by an average 133 acres, more cropland by an average of 28 acres, and grew smaller acreages of soybeans by 22 acres than did the Low yield group. However, in no case was the Chi square value significant at the level selected for testing.

Seventy-four percent of all soybean producers reported to have fertilized and limed their fields according to soil test recommendations. However, most farmers indicated that they tested their soils only every three or four years. Forty-four percent of all producers said the pH

level of their soils was below 6.0. A higher percent of the High yield group (29) indicated the pH level of their soils was above 6.0 than did the Low yield group (19 percent). The Chi square analyses did not reveal significant relationships between soil testing or pH levels and yields.

Eighty-nine percent of all producers planted soybeans in fields preceded by either soybeans or corn. Ninety-five percent of the Low yield producers followed this plan, as compared to 81 percent of the High yield group. The relation of average yield and the nature of the preceding crop was not a significant one.

In regard to texture of soybean land, 67 percent of the Low yield group used land of loamy texture, as compared to 53 percent of the High yield group. The Chi square value was not significant, though it did attain the .20 level of confidence. It was unclear what the relation might be, when considering all types of soil used by soybean producers.

All of the High yield producers marketed at least some soybeans at Jasper, most of them marketing at Jasper only, 14 percent of the Low yield group marketed at Chattanooga only. The relation achieved the .20 level of significance, though not the required .05 probability.

No significance was indicated between size of planter or type of combine used and yields. This was true also in regard to general climatic conditions for the years of 1968 and 1969.

Findings Related to Soybean Production Practices

The farmers in the High yield group had a higher average practice diffusion rating (4.48 out of 5.00) than did the Low yield group (4.37 out of a possible 5.00).

Eighty-five percent of the 38 soybean producers were, on the average in the "using stage" with regard to the 11 recommended production practices included in the interview schedule. No difference was noted when High and Low yield groups were compared.

Surprisingly large percents of both yield groups (41 percent for the High and 48 percent for the Low) had practice diffusion ratings in the "tried" stage (3.50 - 4.49), but were no longer using them.

In regard to recommended practices, the only one that achieved the level ($P < .05$) of probability selected for testing was the number of plants per foot of row at harvest. Eighty-two percent of the High yield group had 10 to 18 plants per foot of row at harvest, as compared to only 48 percent of the Low yield group. This finding does not agree with experiment station research, which in general, has shown no significant relation between plant population and yield of soybeans.

Eighty-two percent of the High yield producers bought seed from a dealer, as compared to only 67 percent of the Low yield group. Nineteen percent of the Low yield group saved their own seed, while none of the High yield producers did so. The Chi square value achieved the .10 level of confidence, indicating some relation between yields produced and the source of seed, though the required level of significance was not reached.

In regard to the relation between width of row and pounds of seed planted per acre and soybean yields, the required .05 level was not attained, though the .20 level was. Fifty-three percent of the High yield group used a 38 inch row width, while 61 percent of the Low yield group used row widths of 36 inches or less. Sixty-five percent of the

High yield producers planted from 42 to 51 pounds of seed per acre, while only 43 percent of the Low yield group planted at this recommended rate.

Use of pre-emergence herbicides, inoculation of soybean seed, and length of time between emergence of soybeans and start of cultivation was not significantly related to yields of soybeans. The Chi square value for these practices did reach the .30 level of confidence, however. Slightly higher percents of the High yield group had used pre-emergence herbicides, inoculated seed, and started cultivation within seven days after soybeans emerged than was true for the Low.

Fertilizer usage data showed no significant relationship between amount and analyses of fertilizer used, or lack of use of any fertilizer. Forty-five percent of all producers used between 6 and 86 pounds of nitrogen, which is not recommended for soybeans. Fifty-two percent of the Low yield group had used nitrogen fertilizer, as compared to only 36 percent of the High yield group, with higher percents of both yield groups using from 6 to 12 pounds of nitrogen. The Chi square value was not significant at the level selected for testing.

Fifty-five percent of all producers had used from 12 to 80 pounds of phosphate per acre. Sixty-two percent of the Low yield producers had used from 12 to 80 pounds of phosphate per acre, as compared to only 48 percent of the High yield group. Also, 52 percent of the High yield producers did not use any phosphate, as compared to only 38 percent of the Low yield group. A general recommendation when soil test results are not available would be from 20 to 40 pounds per acre. The Chi square value was not significant, though the .20 level was attained.

Sixty percent of all producers used from 12 to 120 pounds of potash per acre. Sixty-seven percent of the Low yield group had used from 12 to 80 pounds of potash per acre. Forty-eight percent of the High yield producers had used this amount of potash, and 5 percent had used 120 pounds of potash. Forty-seven percent of the High yield producers had used no potash, as compared to 33 percent of the Low yield group. Though not significant at the .05 level selected for testing, the relation between use of potash and yields did achieve the .30 level of confidence. A general recommendation when soil test results are not available would be from 20 to 40 pounds of potash per acre.

It should be noted that all the data concerning fertilizer usage includes 23 percent of the High and 19 percent of Low yield groups who had heavily fertilized the preceding crop.

All other recommended production practices when tested for relation to yield were found to be insignificant. Thus, little or no apparent relation existed between these practices and yields of soybeans. These practices included: number of weeks prior to planting that the seedbed was prepared, use of certified seed, use of registered seed, selection of varieties (all producers planted recommended varieties), number of seeds planted per foot of row, depth of planting (all producers planted at recommended depths depending on soil and moisture conditions), use of soil testing, testing soils within three years, use of Molybdenum when pH was below 6.0, use of lime when pH was below 6.0, effective control of weeds (e.g., cultivate and/or use of herbicides), effective control of insects and harvesting at correct moisture levels.

Findings Related to Factors Influencing Practice Adoption

Twenty-nine percent of the 38 producers said the one thing they liked most about soybean production was that it was "easy to grow and/or harvest." Twenty-six percent said soybeans was a "good cash crop." Thirty-five percent of the High yield group indicated "easy to grow and/or harvest" as the thing they liked most, while 29 percent of the Low yield producers said the one thing they liked best was that soybeans was a "good cash crop." Other reasons listed (in order of frequency listed by all producers) were, "low labor requirements and low overall production costs," "Low capital requirements," "good cash crop and good cash crop for farm rotation," "will stand dry and/or wet seasons" and "adaptable to land not suited for other crops."

Fifty percent of the soybean producers indicated that "weed control problems" was the one thing they disliked most about soybean production. Fifty-three percent of the High yield group have "weed control problems" as the one thing they disliked most about soybean production, while 47 percent of the Low yield group did so. Other reasons listed were, in order of frequency, "low yields and low net income and/or prices," "price and profit vary too much and government control or prices," "improper moisture and foreign matter sampling for testing at the market," and "conflict in double cropping."

No relation was shown between things liked or disliked most about soybean production and yields.

Sixty-eight percent of all producers said they had no plans for the future concerning soybean production. Sixty-four percent of the High yield group indicated no plans for the future, as compared to 72

percent of the Low yield group. Sixteen percent of the producers said they planned to reduce their acreage of soybeans, as did 12 percent of the High and 19 percent of the Low yield groups. The Chi square value was not significant.

Eighty-eight percent of the High yield group and 86 percent of the Low listed "neighbors and friends" most frequently as a source of advice concerning soybean production. "Seed, fertilizer, or pesticides dealers" ranked second as a source of advice for High yield producers. "Soybean buyers" were indicated as the second choice of advice for the Low yield group. "Equipment dealers" ranked fourth as a source of advice, and "Extension agents" ranked fifth for all yield groups. Other sources were (in order of frequency for all producers), "SCS representative," "soybean specialist," "FHA representative," and "banker or PCA representative."

All of the High yield group listed Extension bulletins and publications, and farm magazines as sources of information concerning soybean production. Ninety percent of the Low yield group listed farm magazines, and 86 percent listed Extension bulletins and publications, and Extension newsletters as important sources of information. Other sources listed (in order of frequency mentioned by all producers) were, monthly or other newspapers, radio, weekly newspapers, farm meetings, commercial bulletins, daily newspapers, field days and tours, and television.

Forty percent of all producers listed "lack of adequate machinery and equipment" as the first most important reason why farmers in general do not adopt recommended production practices, while 35 percent of the

High and 43 percent of the Low yield groups listed this reason first. Forty-one percent of the High and 5 percent of the Low yield producers listed "don't have technical knowledge needed" as the primary reason farmers do not adopt recommended practices. Twenty-four percent of the Low yield group listed "more rewarding activities claim owner's time and money" as the first most important reason for failing to adopt practices. The statistical analysis (Chi square value) of the reasons listed as the first most important reason farmers do not adopt recommended practices was significant at the .05 level selected for testing--establishing a relation with soybean yields.

"The cost of the practice outweighs the benefits" was listed most frequently by all producers, and both yield groups, as the second most important reason farmers in general do not adopt recommended production practices. In neither case was the Chi square value significant at the required ($P < .05$) of significance.

II. IMPLICATIONS AND RECOMMENDATIONS

Based on the findings of this study, a few implications may be drawn. The relatively small number of significant relations found to have existed between the variables studied and soybean yields tended to verify the findings of previous similar studies. Soybean production does not seem to be related to individual recommended production practices to the extent that practices have been found to be influential with other crops grown commercially in Tennessee. However, the use of the total bundle of recommended production practices may be more critical for soybeans than for other crops. Further study in this area may be desirable.

The interest in and need for an educational program is implied by study findings since nearly all soybean producers were interested in such efforts and a large percent felt they lacked technical knowledge needed to do an efficient job.

It was surprising to note the degree to which Extension educational efforts had been reaching the soybean producers through news releases, radio, meetings, publications, newsletters and other media used. The influence of such media would suggest their continued and accelerated use in any educational program developed for the county.

Subject matter should include emphasis on liming and fertilization according to soil test recommendations. The study revealed that soybean growers were not basing their fertilizer usage on current soil test recommendations. In many cases more fertilizer was being used than would be called for by soil test recommendations. Far too few farmers were found to be liming their soybean fields as needed.

Furthermore, continued research and educational efforts should be directed toward expanded use of herbicides, since almost two-thirds of the producers indicated they were not using such chemicals, even though one-half of the growers said weed control was their biggest problem in soybean production.

Further study would appear to be called for regarding row width and number of plants per foot of harvested row, since these items were found to have some influence on yields of soybeans.

Similar surveys of soybean producers in other soybean producing counties in Tennessee should be conducted to ascertain whether or not the findings of this study might apply more generally.

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APPENDIX

THE AGRICULTURAL EXTENSION SERVICE, UNIVERSITY OF TENNESSEE

Knoxville, Tennessee

TENNESSEE SOYBEAN PRODUCTION SURVEY

INTRODUCTION: I am helping with a survey that is being made by The University of Tennessee. The purpose of the survey is to obtain information to use in planning programs helpful to soybean producers. The answers you give will be added to those given by other soybean producers who are being interviewed in this county and other parts of the state to get a complete picture of the soybean situation. Could I have a little of your time to go over these questions?

1. About how many acres do you have in your farm(s)? Cropland?
 - a. Total land in farm(s) _____ acres.
 - b. Cropland _____ acres.
2. How many acres of soybeans did you plant last year? _____ acres.
3. How many acres of soybeans did you harvest for beans? _____ acres.
 - a. What was your average yield per acre? _____ bushels.
4. How many acres of soybeans did you harvest for hay? _____ acres.
 - a. What was your average yield per acre? _____ tons of hay.
5. How much of the harvested acreage was _____ owned, _____ cash, _____ rented, _____ shared?
6. Major occupation of the respondent.
 - a. Full-time farmer _____.
 - b. Part-time farmer _____.
 - c. Business (specify) _____.
 - d. Professional (specify) _____.
 - e. Wage earner _____.
 - f. Housewife or widow _____.
 - g. Retired _____.
 - h. Other (specify) _____.
7. Would you please complete this sentence? (Hand respondent card)

"The thing I list most about soybean production is _____

TO THE INTERVIEWER: If the respondent mentions more than one thing, write all of them, and ask him "Which is most important?" Then underscore it.

8. Would you please complete this sentence? (Hand respondent card)

"The thing I dislike most about soybean production is _____
 _____."

TO THE INTERVIEWER: If the respondent mentions more than one thing, write all of them, and ask him "Which is most important." Then underscore it.

9. Is income from soybeans your major source of income? Yes __, No __.

10. If your answer to question #9 above is NO, what is your major source of income? _____

TO THE INTERVIEWER: The purpose of the next question is to find out if the respondent:

1. is aware of certain recommended practices.
2. is interested in using them or plans to try them.
3. has tried them, but may not be using them now.
4. is still using them, or will use them when the need arises.
5. and his reason for never trying the practices, or for not using them after trying them.

INTERVIEWER WILL ASK APPROPRIATE QUESTIONS TO OBTAIN THE ANSWERS

II. Soybean Production Practices	Un-aware	Read or heard of	Inter-ested in	Plans to try	Has Tried (Not now using)	Now Using
(1) Planted a soybean variety or varieties recommended last year (as in Performance Trials Bulletin—that year)						

i. Reasons for never trying practice OR not using it after trying

(2) Planted between May 1 and June 15 last year (see Ext. Pub. 421)						
---	--	--	--	--	--	--

i. Reasons for never trying practice OR not using it after trying

	Un- aware	Read or heard of	Inter- ested in	Plans to try	Has Tried (Not now using)	Now using
(3) Used inoculant on seed or grew soybeans in all fields at least one year in the last three prior to last year (see Pub. 421)						

i. Reasons for never trying practice or not using it after trying

(4) Treated seed with Molybdenum where lime was not used or where pH was below 6.0 (see Pub. 421)						
---	--	--	--	--	--	--

i. Reasons for never trying practice OR not using it after trying

(5) Used recommended seeding rate (see Pub. 378)						
--	--	--	--	--	--	--

i. Reasons for never trying practice OR not using it after trying

(6) Prepared seedbed in advance of planting (see Pub. 421)						
--	--	--	--	--	--	--

i. Reasons for never trying practice OR not using it after trying

(7) Fertilized (including liming) according to soil test recommendations (see Pub. 421 & 381)						
---	--	--	--	--	--	--

i. Reasons for never trying practice OR not using it after trying

	Un- aware	Read or heard of	Inter- ested in	Plans to try	Has tried (Not now using)	Now using
(8) Effectively control- led weeds last year by using recommended procedures (see Pub. 381)						

i. Reasons for never trying practice OR not using it after trying

(9) Effectively control- led insects last year by using recom- mended procedures (see Pub. 506)						
---	--	--	--	--	--	--

i. Reasons for never trying practice OR not using it after trying

(10) Harvested when mois- ture was between 10 & 13 percent (see Pub. 421)						
--	--	--	--	--	--	--

i. Reasons for never trying practice OR not using it after trying

(11) Got the advice of professionals in the area of soybean pro- duction and market- ing						
--	--	--	--	--	--	--

i. Reasons for never trying practice OR not using it after trying

12. During the past year have you talked to anyone about your soybean production and marketing? Yes _____, No _____.

13. With whom have you talked? (Check one or more of the following. If respondent gives names, write them at the side and check list later).

- a. Extension agent _____
- b. Extension soybean specialist _____
- c. Soybean buyer _____
- d. SCS representative _____
- e. FHA Representative _____
- f. Equipment dealer _____
- g. Seed, fertilizer or pesticide dealer or salesman _____
- h. Banker or PCA representative _____
- i. Neighbor or friend _____
- j. Other (specify) _____

14. From which of the following sources did you receive useful information concerning your soybean production and marketing last year?

- a. Extension bulletins or publications _____
 b. Commercial bulletins _____
 c. Farm magazines _____
 d. Daily newspapers _____
 e. Weekly newspapers _____
 f. Monthly or other newspapers _____
 g. Radio _____
 h. Television _____
 i. Farm meetings _____
 j. Field days or tours _____
 k. Newsletters _____

15. What was the highest grade level that you completed in school? (Circle one.)

- | | | | | | | |
|------|------------|------------|------------------|------------|----------|----------|
| 0 | 12345678 | 9 10 11 12 | 1 2 3 4 | Bachelor's | Master's | Doctor's |
| None | Grade Sch. | H.S. | College Undergr. | degree | degree | degree |

16. Age of respondent?

- a. Under 25 _____
 b. 25 - 34 _____
 c. 35 - 44 _____
 d. 45 - 54 _____
 e. 55 - 64 _____
 f. 65 - 74 _____
 g. 75 or more _____

17. What plans do you have for the future of your soybean enterprises? (Including use of the 11 production practices listed plus others mentioned and possible expansion.)

18. (If respondent says he has no plans in question 17 above, ask, "Why not?")

19. How many weeks ahead of planting did you begin seedbed preparation last year? _____ weeks.

20. Did you prepare a well-pulverized, firm, smooth seedbed? Yes _____, No _____.

21. What size planter did you use? One row _____, Two row _____, Four row _____, Six row _____.

22. What width row did you plant? Under 36 inches (specify _____) _____, 36 in. _____, 38 in. _____, 40 in. _____, 42 in _____, broadcast _____.

23. Did you periodically check the adjustment of your planter to assure a uniform row width? Yes _____, No _____.

24. Where did you get your seed? Dealer ____, Wholesaler ____, Farmer ____, Other (specify ____), _____
25. Was the seed planted certified? ____, Registered? ____ (check if appropriate).
26. How did you plant? (How much seed per acre and what variety). Pounds seed per acre ____, Variety _____.
27. How many seed would you say that you planted per foot of row? ____ seed.
28. How many plants per foot of row would you say that you had at harvest? ____ plants.
29. About how deep did you generally plant your soybean seed? ____ 3/4", ____ 1", ____ 1-1/2" ____ 2", ____ Other (specify _____).
30. In the main, of what texture does your soybean land tend to be? (Check one) Sandy ____, Loamy ____, Clay ____, Cherty ____.
31. Have you ever had your soybean land tested? Yes ____, No ____.
32. If answer yes to #31. When _____ (Most recent test).
33. (If Yes to question #31) By whom was it done? U. T. _____, Federal Chemical Company _____, Other (specify _____) _____.
34. How much fertilizer did you apply last year?
- ____ Grade ____ Lbs. per acre
 ____ Grade ____ Lbs. per acre
 ____ Grade ____ Lbs. per acre
 ____ Grade ____ Lbs. per acre
35. (If Yes to question #31) Was the pH ____ under 6.0 ____ above 6.0?
36. If the pH was under 6.0, has the lime been applied? Yes ____, No ____.
 If so, when? _____ (year and season).
37. If the pH was under 6.0, did you use Moly? Yes ____, No ____.
38. How did you control weeds last year (Please check appropriate sequence)
- a. ____ Cultivation only. If so, how many times? ____
- b. ____ Used a pre-emergent herbicide (If so, which one or ones)
 Herbicide(s) _____
- c. ____ Used a post-emergent herbicide (If so, which one or ones)
 Herbicide(s) _____

39. How effective would you say your weed control was last year?
Excellent ____, Good ____, Fair ____, Poor ____. If only Fair or Poor,
what measures do you plan to take to correct the problem? _____

40. Did you use any insect control measures last year? Yes ____, No ____.
If yes, specify _____
41. How effective would you say your insect control was last year?
Excellent ____, Good ____, Fair ____, Poor ____. If only Fair or
Poor, what measures do you plan to take to correct the problem?

42. What type of combine did you use in harvesting soybeans?
Pull-type ____, Self-propelled ____.
43. If you own a combine, how many acres were harvested with it last year?
____ acres.
44. How many acres did you pay to have custom harvested? ____ acres.
How paid? _____
45. What time of day did you harvest your soybeans last year? Early
morning ____, Mid-day ____, Late afternoon ____, Night ____.
46. Where did you market your soybeans last year? Jasper ____, Tulla-
homa ____, Chattanooga ____, Alabama ____, Other (specify) _____.
47. Did you inoculate your seed last year? If Yes, by what method?
Dry ____, Wet ____.
48. Did you use Moly-Inoculant mixture? Yes ____, No ____.
49. What crops were grown in your soybean fields two years ago and how
were they fertilized?
____ Crop ____ Grade ____ Lbs.
____ Crop ____ Grade ____ Lbs.
____ Crop ____ Grade ____ Lbs.
50. How soon was cultivation started after the soybeans were up?
____ days.
51. Did you receive any dockage on soybeans sold? Yes ____, No ____.
If Yes, for what reason? _____
52. Was lodging a problem last year? Yes ____, No ____.
53. What were the general climatic conditions last year? Favorable
____; Unfavorable ____.
- a. At planting? Good ____, Fair ____, Poor ____.
- b. Growing season? Good ____, Fair ____, Poor ____.
- c. At harvest? Good ____, Fair ____, Poor ____.

54. We have listed on these cards some reasons why soybean producers sometimes do not adopt recommended soybean production and marketing practices. (Hand respondent set of cards). Now, here is what we would like you to do:

- a. Please look through all cards: read each one; and pick out the 3 cards that show why you believe soybean growers do not use better production practices. After you have selected 3, please hand me the rest.
- b. Now these 3 reasons are not of the same importance; so, please go through them and decide which one is probably of most importance. Please give me the number on the back of the card. Also, please do this with the other 2 cards.

Rank	1	2	3
Card number			

- c. Are there any other reasons why you believe soybean growers do not adopt recommended production and marketing practices?
-

55. (OPTIONAL) Approximately what was your total gross family income last year? (Hand card to respondent and ask him to select a category)

- | | |
|--------------------------|--------------------------|
| a. 0 - 1999 _____ | i. 16,000 - 17,999 _____ |
| b. 2,000 - 3,999 _____ | j. 18,000 - 19,999 _____ |
| c. 4,000 - 5,999 _____ | k. 20,000 - 21,999 _____ |
| d. 6,000 - 7,999 _____ | l. 22,000 - 23,999 _____ |
| e. 8,000 - 9,999 _____ | m. 24,000 - 25,999 _____ |
| f. 10,000 - 11,999 _____ | n. 26,000 - 29,999 _____ |
| g. 12,000 - 13,999 _____ | o. 30,000 - 49,999 _____ |
| h. 14,000 - 15,999 _____ | p. 50,000 - 99,999 _____ |

NAME OF RESPONDENT _____

Address _____ County _____ Number _____

Date _____ Tenure status _____

NAME OF RESPONDENT _____

NUMBER _____

QUESTIONS FOR THE INTERVIEWER TO ANSWER:

56. All people do not adopt practices at the same rate or time. About where would you place the respondent with respect to adopting new recommended soybean production and management practices?
- a. _____ Among the first few
 - b. _____ Soon after the first few
 - c. _____ Sooner than average
 - d. _____ A little later than most
 - e. _____ Among the last few.
57. Is the respondent
- a. _____ Man?
 - b. _____ Woman?
58. Interest of respondent in improving soybean production and marketing? (In interviewer's judgment)
- a. _____ Very interested
 - b. _____ Somewhat interested
 - c. _____ Indifferent
 - d. _____ Not interested.
59. Respondent's attitude toward the survey? (In interviewer's judgement)
- a. _____ Friendly
 - b. _____ Somewhat friendly
 - c. _____ Indifferent
 - d. _____ Antagonistic.
60. Should the respondent pay more attention to his soybean production and marketing?
- a. _____ Yes.
 - b. _____ No.
 - c. _____ Uncertain.
61. How well do you know the respondent?
- a. _____ Very well
 - b. _____ Fairly well
 - c. _____ Not very well
 - d. _____ Not at all.

VITA

William A. Hall was born in Waverly, Tennessee, on January 27, 1924. He attended elementary school in Humboldt, Tennessee, and was graduated from Humboldt High School in 1942. He served three years in the armed forces during World War II. He entered The University of Tennessee Junior College at Martin, Tennessee, in September, 1946. He entered The University of Tennessee in September of 1949, and in December, 1951, he received a Bachelor of Science degree in Agricultural Business. He was employed by The University of Tennessee Agricultural Extension Service as an Assistant County Agent in Morgan County in February, 1952. He transferred to Marion County in August of 1954 and was appointed County Agricultural Agent of Marion County in August of 1956.

He has done graduate study at the University of Arkansas, Colorado State University, and the University of Wisconsin, in addition to The University of Tennessee.

He is a member of the First Baptist Church of Jasper, a Deacon, Church Treasurer, Superintendent of the Young Adult Sunday School Department, and past Training Union Director. He is a member of the Jasper Lions Club and has served two terms as President and as Deputy District Governor.

He is married to the former Betty Ann Morgan of Knoxville, Tennessee, and has two children, Janet Lynn and Barry Alan.