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# Evaluation of the Farm and Home Development Program in Deuel County: 1958 to 1964

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**August 1966**

Evaluation  
of the  
Farm and Home  
Development Program  
in Deuel County  
1958 to 1964

**Rural Sociology Department  
Agricultural Experiment Station  
and Cooperative Extension Service  
SOUTH DAKOTA STATE UNIVERSITY, BROOKINGS**

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## SUMMARY

An experimental Farm and Home Development program was started by the Deuel County Extension Service in 1956 for a selected group of volunteer farm families by employing a Farm and Home Development Agent. The FHD agent was to work closely with each family to give guidance in establishing short and long-range goals, in analyzing farm business, and in obtaining information about and adopting better farming practices. This improved farm management should provide income to help reach desired family goals. An added incentive was offered cooperating farmers in the form of low cost fertilizer obtained through the cooperation of the Tennessee Valley Authority test demonstration program.

The evaluation program was begun in 1958 after the Farm and Home Development program had been in operation for 18 months. This fact should be taken into consideration when evaluating the statistical data.

Measurements before and after 6 years of Farm and Home Development participation showed some significant changes for both the Program and the Control families.

During that period the 38 Program families studied had increased the number of acres operated and had larger net worth and gross farm income; they also had a higher level of living and a more favorable attitude toward the Farm and Home Development program. There was a decline in the amount of participation in farm and non-farm organizations and fewer contacts with all agricultural agents in 1964 than in 1958.

While the Control farmers also made some significant changes during this period, the 1964 comparison of Program and Control farmers showed the Program farmers "higher" on most of the characteristics measured. For example, they had more contacts with County Extension Agents and more contacts with all agricultural agencies combined. They were more favorable toward adopting recommended farm practices; they adopted more recommended livestock and general farming practices, and used fertilizer according to recommended methods to a greater extent. They also had a more favorable attitude toward South Dakota agricultural agencies.

# Evaluation of the Farm and Home Development Program in Deuel County 1958 to 1964

JEANNE C. BIGGAR and  
HOWARD M. SAUER†

## I. INTRODUCTION

During the past two decades, the traditional American farm has met increasing demands for adjustments in institutionalized patterns of operation to fit modern conditions. Greater availability and convenience of consumer goods and services have resulted in higher living standards. Costs of production have increased more rapidly than product prices. At the same time technological developments have increased the productivity of the farm worker, and more efficient practices and methods of production have been developed through scientific research. The rate of return on the family farm investment of capital and labor depends upon the rate of adoption of more efficient methods and practices.

The Cooperative Extension Service was established to disseminate information about farm operating

and family living practices developed by the Agricultural Experiment Stations. Extension programs in general have been designed to encourage the adoption of improved methods and higher family living standards. The use of news media, discussion meetings, demonstrations and personal contacts with farm families are the most common educational methods employed. Limitations of time and personnel have restricted the development of many intensive programs which would otherwise be desirable.

### **The Farm and Home Development Program**

In 1956, the Extension Service, in cooperation with the Tennessee Valley Authority, started a Farm

\*This is the second report of Rural Sociology Department research designed by John D. Photiadis, now at West Virginia University, Morgantown, West Virginia.

†Former Instructor, and Professor and Head of Rural Sociology Department, respectively.

and Home Development Program in Deuel County. The major goal of this program was to emphasize total farm planning. A specific objective was to demonstrate the benefits from extensive use of fertilizer. Since the Tennessee Valley Authority cooperated with this program, it provided fertilizer at less than market prices as an incentive.

A Farm and Home Development Agent was assigned to work intensively with the participating families in this program. Total farm planning was to involve reaching personal and family goals as well as the farm business goals. Various alternatives of organizing the farm as well as specific operating methods were to be considered and analyzed. The Farm and Home Development Agent was responsible for helping the participating farmers apply sound farm business planning methods.

Forty-five families were selected to participate in this intensive Program. They were chosen from a number of volunteers, considering characteristics including township location, age, education, type of farming and size of farm.

The Farm and Home Development Program enabled the Extension Agent to develop more intensive personal contacts between the farm family and the Extension Service. This was expected to result in greater economic development as well as better farm living for the participating families through the farm management changes effected through sound planning.

The Rural Sociology Department

began this study in 1958 to obtain an estimate of the effectiveness of the Farm and Home Development Program.<sup>1</sup> The participating Deuel County farm families were compared with a similar group of nonparticipants over a 6 year period.

### **The Process of Effecting Change**

The Farm and Home Development Program is essentially a change program. Some understanding of the process of effecting change is needed to evaluate the effectiveness of the Program in relation to its goals.

Reports on the results of other change programs indicate that the diffusion and adoption of innovations is a complex process. Diffusion, or the dissemination of knowledge from the scientist to the farmers who adopt this knowledge, involves social interactions between people. Adoption, or the application of the knowledge to the individual farm situation, involves individual decision-making.

Key persons in the diffusion and adoption process are called "change-agents." "Innovators" and "early adopters" also play an important role in diffusing knowledge of improved methods by demonstrating practical applications on their own farms. Regular Extension personnel seldom have time to do more than make knowledge available through their established programs. The Farm and Home Development Agent is in the unique position of

<sup>1</sup>Preliminary Report No. 1, John D. Photiadis, *Evaluation of Farm and Home Development*, presented information on the characteristics of these farmers in 1958.

being able to follow through on each step of the adoption process with the individual farm family.

The adoption process has been subdivided into five stages:<sup>2</sup>

1. The *awareness stage*, where the farmer has some knowledge of the new idea or method, but lacks adequate information.
2. The *interest stage*, where the farmer seeks additional knowledge about the innovation. He tends to have a favorable attitude toward the idea, although reserving judgment until he has considered it for his particular situation.
3. The *evaluation stage*, where the farmer puts the idea on "mental trial." He evaluates the effect of the change on his present and future operation. He may seek advice from others, usually farmers like himself. At this point the change-agent is in a strategic position to influence the farmer's decision and encourage him to take action. The decision is made at this time whether to adopt or not adopt the idea. The decision to adopt involves taking action and accepting the responsibility for the decisions. Many farmers hesitate to take action because of inertia or the fear of possible undesirable consequences.
4. The *trial stage*, where the farmer puts the innovation

to actual practice. If the practice is divisible, most farmers will test the idea on a limited basis. This enables him to visualize the effect of the change for his particular situation. The change-agent can give valuable assistance at this time by interpreting accurately the results of the trial and projecting the result of more extensive application of the practice.

5. The *adoption stage*, where the innovation is fully applied and adopted as a permanent practice.

Rejection of the innovation may occur during any of the first four stages. When either expected or actual returns from the change do not outweigh the expense and effort of adoption, the farmer will reject the change. At any time after adoption, discontinuances, based on rational or irrational reasons, often occur. In general, late adopters tend to have the highest rates of discontinuance.

Adoption occurs at varying rates according to the characteristics of the innovation. The rate of adoption tends to increase as the farmer is able to perceive the relative advantage of the innovation over his present methods, and the compatibility with existing norms and values. Further, the rate of adoption depends upon the degree of com-

<sup>2</sup>Everett M. Rogers' stages have been used here, and his definitions of each stage paraphrased. From *Diffusion of Innovations*, The Free Press of Glencoe, New York, N. Y., 1962, pp. 79-86.

plexity limiting the farmer's understanding of the innovation; the degree of divisibility, enabling trial on a limited basis; and the degree of communicability allowing him to discuss the practice with others.

Adoption rates are variable between individuals. Some farmers move quite rapidly from "awareness" to "adoption." Others may be aware of an innovation for extended periods before they pass to the trial stage. An example is the rate of adoption of hybrid seed corn. After 10 years in which demonstrations had clearly shown the superiority of hybrid seed, a sample of Iowa farmers indicated that one percent of the responders had failed to adopt hybrid seed corn.<sup>3</sup>

Roger's innovativeness continuum delineates five farmer categories: the *innovators*, (2.5%) who are the first to adopt; the *early adopters*, (13.5%); the *early majority*, (34%); the *late majority*, (34%); and the *late adopters*, (16%) some of whom never reach the trial stage. He characterizes the relatively early adopters as "... younger in age, have higher social status, a more favorable financial position, more specialized operations and a different type of mental ability (ability to deal with abstract ideas)."<sup>4</sup>

Adoption studies in the Midwest showed that earlier adopters were more active in farm organizations and cooperatives as well as other local organizations. They were more likely to cut across community lines to participate in county and state organizations. These farmers used Extension services more fre-

quently. The earliest innovators sought and obtained information from other innovators and directly from the agricultural scientists. On the other hand later adopters tended to rely on friends and neighbors for social interaction as well as information. The innovators had more favorable attitudes toward sources of information, science and educators, and tended to be more venturesome. The laggards were likely to depend upon "magic and folk beliefs" and generally fear change.<sup>5</sup>

The professional change-agent then needs a variety of approaches in his contacts with farmers in order to influence the greatest number. The Farm and Home Development Agent provides information, interpretation and reinforcement on a person-to-person basis. He is able to help farm families assess the effect of adoption in relation to the total farm organization and farm and personal goals.

## II. PROCEDURE OF EVALUATION STUDY

### Design of the Study

This study was based on the hypothesis that the Farm and Home Development Program implemented more recommended changes in the group of participating farmers than could be observed in a control

<sup>3</sup>*Ibid.*, p. 106.

<sup>4</sup>*Ibid.*, p. 192.

<sup>5</sup>Subcommittee for the Study of Diffusion of Farm Practices, North Central Rural Sociology Committee, *Adopters of New Farm Ideas*, North Central Regional Extension Publication, No. 13, Chicago, Ill., October 1961.



group of nonparticipating farmers from Deuel County between 1958 and 1964.

In order to accept or reject this hypothesis, the following null hypotheses were proposed and tested:

1. There is a significant difference between the Program (experimental) group and the control (nonparticipating) group in Period I (1958). The rejection of this hypothesis would establish that both groups were in the same statistical population and assure the comparability of the two groups.
2. There is no significant difference (change) between the Program group in Period I (1958) and Period II (1964). Rejection of this hypothesis would indicate that some measurable degree of change occurred during this period of "treatment."
3. There is no significant difference (change) between the Control group in Period I and Period II. Rejection of this hypothesis would have same meaning as in Hypothesis II. Acceptance of this hypothesis and rejection of Hypothesis 2 would infer some effectiveness of the Farm and Home Development Program.
4. There is no significant difference between the Program group and the Control group in Period II. Rejection of this hypothesis would imply effectiveness of

the program, provided that the Program group showed more change. Acceptance would infer that the program did not produce more than normal measurable changes.

The degree of change was measured by comparing the differences between groups and between periods for selected quantified variables. These variables, to be discussed later, included adoption, knowledge, attitudes toward specific farm operation and family living practices.

### The 1958 Benchmark Study

In the second year of the Farm and Home Development Program in Deuel County, the Department of Rural Sociology began the first stage of a "before-after" study to evaluate the effectiveness of the Program. The forty-five participating farm operators and homemakers, plus a random sample of nonparticipating families were interviewed by trained personnel.<sup>6</sup> Statistical analysis of the responses showed that as a group, the Program farmers were significantly different in a number of characteristics from the group selected at random.<sup>7</sup> Comparison of means for the two groups indicated that the Program farmers were younger,

<sup>6</sup>For further details of this 1958 survey, see John D. Photiadis, *Evaluation of the Farm and Home Development Program in South Dakota*, Preliminary Report No. 1, Department of Rural Sociology, Division of Agriculture, South Dakota State College, Brookings, South Dakota, 1959.

<sup>7</sup>The chi-square test was employed with the probability of chance difference at less than 1%.

had more years of formal education, higher levels of living, greater capital investments and net worth, higher rates of adoption, and more knowledge of and more favorable attitudes toward adoption of the recommended farm practices. These differences closely parallel the differences between earlier adopters and later adopters discussed previously. Apparently the kind of farmers characterized as relatively early adopters on Rogers' innovativeness continuum were most likely to volunteer to participate.

If the program farmers were in fact early adopters, they could be expected to show more changes over time than the Control (nonparticipating) group even though no "treatment" was applied. Therefore, no valid conclusions could be obtained from comparisons of the Program group with the random sample.

A matching technique was then employed to obtain a Control group of nonparticipating farmers with characteristics similar to the Program farmers. Each Program farm family was selectively matched with a family from a random sample on the basis of type of farming and as many of the other quantified variables as possible. Forty-three matched pairs were obtained. Statistical comparisons of the two groups now showed that the Control group was not significantly different from the Program group in all but three characteristics.<sup>8</sup> The Program farmers had more contacts with Soil Conservation personnel and County Extension

Agents, and greater participation in formal organizations. Differences in these areas could logically be expected as the result of the 2 years participation in the Farm and Home Development Program and encouragement to participate and to use the services of other agricultural agencies. Similarity in personal, socio-economic, and farm practices characteristics provided validity for the assumption that the two groups were comparable.<sup>9</sup>

### The 1964 Follow-up Study

The second stage of the evaluation study was conducted in the summer of 1964 by the Rural Sociology Department. Some adjustments in both experimental and control samples were necessary due to migration and refusals to be interviewed (table 1). Five farm fam-

<sup>8</sup>The t-test for sample means of paired observations was used:

$$t = \frac{\bar{d}}{s_{\bar{d}}}$$

$$\text{where } \bar{d} = \bar{x}_1 - \bar{x}_2$$

$$\text{and } s_{\bar{d}} = \sqrt{\frac{\sum D^2 - (\sum D)^2 / N}{N(N-1)}}$$

and D is the sum of differences between observations  
and N is the number of paired observations

from Robert G. D. Steel and James H. Torrie, *Principles and Procedures of Statistics*, McGraw Hill, New York, N. Y., 1960, pp. 78-9.

<sup>9</sup>Similarity of the Program and Control groups provided the basis for the rejection of Hypothesis 1: There is a significant difference between the Program group and Control group in Period 1.

**Table 1. 1964 Replacements in 1958  
Program and Control Groups**

Changes	Program Farmers	Control Farmers
1958 Total .....	43	43
Losses:		
Moved to "town" ..	-2	-4
Moved .....		-2
Refused .....	-1	-4
No "Match" .....	-2	
Remainder of		
1958 Group .....	38	33
Additions .....		5
Total 1964 Group	38	38

ilies were selected from the original random sample to substitute in the matching control group, using the 1958 matching technique. Thirty-eight matched pairs of farm families were obtained. Statistical comparisons of these two groups on the basis of their 1958 characteristics produced results similar to the 1958 comparisons of the two groups.<sup>10</sup> The Program farmers had more participation in farm organizations and more contacts with Soil Conservation and Extension Agents. They also had more favorable attitudes toward recommended farm practices and Agricultural Extension agencies. Comparisons of all other personal, socio-economic and farm practices characteristics showed no significant differences between the two groups. Participation in the Farm and Home Development Program for 2 years prior to 1958 is again assumed to account for the differences between the experimental and control groups. The adjusted Program

and Control groups were considered comparable within the design of the evaluation study.

Comparable data were collected by interviewing farm families in 1958 and in 1964. The degree of change between 1958 and 1964 was measured by the differences in the response scores for each variable. The differences between periods for each group and between the Program and Control farmers for each period are presented in the sections following.

### **III. FINDINGS OF THE EVALUATION STUDY**

#### **Characteristics of Farmers in 1958**

The farm families composing both groups were not representative of the total farm population in Deuel County. They were possibly representative of the type of families who were most likely to benefit from the services of the Extension Agent and related agricultural agencies. They were relatively young farm families in the process of expanding their business. The following is a general description of these families and their farming operations based on the group averages (means).

**Personal and Family Characteristics.** On the average, these farm operators were 34 years old with nine grades of formal education (table 2). They had operated farms for about 9 years. The homemakers were about 31 years old and had

<sup>10</sup>The t-test for sample means of paired observations was used. The test results and levels of significance for each variable are given in Table A1, Appendix. Hypothesis 1 was again rejected.

completed 11 years of school. The average family had two children of grammar school age. The Program families were somewhat younger and the family size was slightly larger. These differences were not great enough to be significant.

**Economic Characteristics.** In 1958 the gross farm income of the Program farmers was about \$10,000, and the Control group averaged about \$8,500 (table 3). A few families in each group had small income from nonfarm sources. The net worth of the Program farmers averaged about \$28,000, and the Control group averaged about \$27,000. These

differences were not statistically significant. Land operated by both groups averaged about 370 acres with a slight advantage in size for the Control farmers. The Program farmers owned an average of 228 acres while the Control farmers owned 204 acres. This again was not a significant difference.

**Participation in Formal Organizations and Agricultural Programs.** The level of participation in non-farm organizations was about the same for both groups (table 4). The Program farmers tended to have a significantly higher level of participation in farm organizations than the Control farmers. The average

Table 2. Comparison of Farm and Home Development Program Farmers with Control Farmers on Personal and Family Characteristics, 1958

Personal and Family Characteristics	N	Mean		“t” Value	Level of Significance
		Program Farmers	Control Farmers		
<b>Farm Operators</b>					
Age (Years)		33.7	34.4	−.594	N.S.
Education (Years)		9.5	9.5	.000	N.S.
Number of Years Farming		8.3	9.2	−.852	N.S.
<b>Homemakers</b>					
Age		30.5	32.9	−1.436	N.S.
Education		11.1	11.1	.000	N.S.
<b>Families</b>					
Size		4.7	4.0	1.921	N.S.

Table 3. Comparison of Farm and Home Development Program Farmers with Control Farmers on Economic Characteristics, 1958

Economic Characteristics	N	Mean		"t" Value	Level of Significance
		Program Farmers	Control Farmers		
Gross Income		\$10,101	\$ 8,441	1.473	N.S.
Additional Income		\$ 110	\$ 20	1.783	N.S.
Net Worth		\$28,321	\$27,001	.421	N.S.
Acres Operated		365	373	-.291	N.S.
Acres Owned		228	204	.722	N.S.
Percent Acres Owned		63.4	54.4	1.224	N.S.

score of the Program farmers was 50% of the highest score while the Control farmers had an average score of 38%.<sup>11</sup> Homemakers had much lower rates of participation in formal organizations than the operators, and the Control and

Program homemakers scored about the same.

On the basis of contacts with agricultural agencies the Program farmers had significantly higher scores than the Control group.<sup>12</sup> Both groups had about the same number of contacts with the Agricultural Stabilization and Conservation Service. However, the Program participants had used the

<sup>11</sup>Scores for participation in formal organizations were derived in the following manner: The farmer was given one point for membership in the previous year; two points for regular attendance; three points for contributions or dues; four points for committee work; and five points for holding office. Separate scores were tabulated for farm organizations and nonfarm organizations, which included school, community and church groups. The total organization participation score was the sum of the scores for farm and nonfarm organizations plus points for public offices held in the preceding 3 years.

<sup>12</sup>Scores for participation in agricultural programs were derived by totaling points given for each contact with each agency in the preceding year. The points were weighted for different types of contacts with agricultural agents, such as office visits, attendance at meetings, home visits. For a more detailed description of development of scale see Photiadis, *op. cit.*, p. 9.

**Table 4. Comparison of Farm and Home Development Program Farmers with Control Farmers on Participation Variables, 1958**

Participation Variables	Highest Score	Mean		“t” Value	Level of Significance
		Program Farmers	Control Farmers		
		% of Highest Score	% of Highest Score		
<b>Formal Organizations</b>					
<b>Operators</b>					
Farm	50	50	38	2.128	.05
Nonfarm	33	26	18	.124	N.S.
All Organizations and Public Office	99	48	39	1.830	N.S.
<b>Homemakers</b>					
Farm	17	50	50	.124	N.S.
Nonfarm	17	34	26	.574	N.S.
All Organizations and Public Office	47	57	69	-.870	N.S.
<b>Contacts—Agricultural Agents</b>					
<b>Operators</b>					
ASC	192	29	21	1.867	N.S.
SCS	276	15	8	2.198	.05
County Extension	336	38	10	6.429	.001
All Agents	999	38	10	7.858	.001
<b>Homemakers</b>					
County Extension	24	32	43	-.622	N.S.

services of the Soil Conservation Service and the County Extension Agent to a greater degree than the Control group. As stated previously this was assumed to be the result of the encouragement by the Program to utilize the services of other agencies. However it is possible that the Program farmers kept closer contact with agricultural agents before 1956, and therefore had more opportunity to learn about and volunteer for the Farm and Home Development Program at the start. Extension participation by homemakers was about the same for both groups with a slightly higher average score for the housewives in the Control group.

**Knowledge, Attitudes and Adoption of Farm Practices.** Knowledge, attitudes, skills and habits are three dimensions of potential change.<sup>13</sup> In this study, knowledge indicates the *awareness* and *interest* stages of adoption; attitude indicates the *evaluation* and *trial* stages; and skills and habits indicate the *adoption* stage on the adoption continuum.<sup>14</sup> Farm operators participating in the Farm and Home Develop-

ment Program had generally higher average scores for knowledge, attitude, and adoption of farm practices (table 5). However, the difference was not statistically significant except in the attitude toward recommended practices. The more favorable attitudes by Program farmers are attributed to the influence of the Farm and Home Development Programs' 2 year emphasis on changes. However, as pointed out previously, early adopters generally have more favorable attitudes toward change. If, in fact, the Program group of farmers are earlier adopters than the Control group we can expect that at least some part of the change measured between periods can be imputed to this characteristic. Both groups scored nearly 75% on knowledge of general basic farm practices, and had adopted about 60% of the practices at the time of the interview. Knowledge,

<sup>13</sup>Photiadis, *op. cit.*, p. 10.  
<sup>14</sup>Questions on farm practices were selected with the help of subject matter specialists, and were designed to measure the degree of each dimension of knowledge, attitude, and adoption. Individual farmers were scored only on the enterprises included in his 1958 farming operation.

**Table 5. Comparison of Farm and Home Development Program Farmers with Control Farmers on Farm Practices Variables, 1958**

Farm Practices Scores	N	Mean		"t" Value	Level of Significance
		Program Farmers	Control Farmers		
Knowledge of Recommended Practices		77.7	72.7	1.587	N.S.
Attitude toward Recommended Practices		81.5	71.6	2.990	.01
Adoption of Recommended Practices		63.7	59.8	1.318	N.S.
Fertilizer Score		77.1	69.2	.899	N.S.

attitude and adoption questions on fertilizer were asked of all farmers who had used a soil test in the previous year. These items were scored separately from other farm practices to check for bias which might have been introduced by the reduced cost of fertilizer to the Program farmers. Although the Program farmers showed a higher average fertilizer score (77%) than the control farmers (69%), the difference was not significant.

#### Differences Between Groups in 1964

The evaluation study was designed to answer two questions: What changes did each group make between 1958 and 1964?<sup>15</sup> What significant differences resulting from these changes were found between the Program group and the Control group in 1964?<sup>16</sup> In answering these questions, the findings center on two measurements for each quantified variable. The first measurement is the average (mean) change or difference; the second is the test of significance of the cumulative changes of in-

dividual farmers between the study periods, or the cumulative differences between paired farmers in 1964.

In some cases the discrepancy between changes or differences in the averages compared and the statistical significance of changes for individual farmers or differences between paired farmers may seem inconsistent. For example, the 12% average increase in acreage *operated* for Control farmers was associated with significant changes for the individual Control farmers between the 1958 and 1964 observations (table 6). On the other hand, the 12% average increase in acreage *owned* for this group was not associated with significant changes among individual farmers over the 6-year period. This was true because the magnitudes of the individual changes among these farmers were irregular. That is, some farmers showed a large in-

<sup>15</sup>See Appendix Table A2 and A3 for "t" test results for all quantified variables for Program and Control groups, respectively.

<sup>16</sup>See Appendix Table A4 for "t" test results.

Table 6. Acreage Operated by Farm and Home Development Farmers and Control Farmers, 1958 and 1964, Changes and Differences

Farmer Group	Acreage Operated		% Change	"t" Value	Level of Significance
	Mean 1958	Mean 1964			
Program Farmers	365	405	10.0	3.035	.01
Control Farmers	373	417	11.7	3.165	.01
Difference between Farm Groups	-8	-12			
"t" Value	-.291	-.208			
Level of Significance	N.S.	N.S.			

**Table 7. Acreage Owned by Farm and Home Development Farmers and Control Farmers, 1958 and 1964, Changes and Differences**

Farmer Group	Acreage Owned		% Change	“t” Value	Level of Significance
	Mean 1958	Mean 1964			
Program Farmers	227	235	3.5	.529	N.S.
Control Farmers	204	228	11.8	1.027	N.S.
Difference between Farm Groups	23	7			
“t” Value	.722	.243			
Level of Significance	N.S.	N.S.			

**Table 8. Home Facilities for Farm and Home Development Farmers and Control Farmers, 1958 and 1964, Changes and Differences**

Farmer Group	Home Facilities Score		% Change	“t” Value	Level of Significance
	Mean 1958	Mean 1964			
Program Farmers	2.50	3.00	20.0	3.748	.001
Control Farmers	2.41	2.74	13.7	2.645	.02
Difference between Farm Groups	.09	.26			
“t” Value	.367	1.271			
Level of Significance	N.S.	N.S.			

**Table 9. Gross Income for Farm and Home Development Farmers and Control Farmers, 1958 and 1964, Changes and Differences**

Farmer Group	Gross Income		% Change	“t” Value	Level of Significance
	Mean 1958	Mean 1964			
Program Farmers	\$10,101	\$13,451	33.2	4.035	.001
Control Farmers	8,441	10,951	29.7	1.653	N.S.
Difference between Farm Groups	1,660	2,500			
“t” Value	1.473	1.357			
Level of Significance	N.S.	N.S.			



crease; others, a small increase; and still others, decreases in acreage owned. Decisions as to whether changes or differences were significant are necessarily based on the statistical tests.

However, the restrictions of the statistical tests do not preclude judgmental decisions as to the practical importance of the changes and differences indicated by the averages. Even though these judgments were excluded from the design of this study, they may be as important in the final evaluation of the Program.

**Economic Characteristics.** Both groups enlarged their farming operations between 1958 and 1964. The size of Program farms increased 11% in 6 years to an average 405 acres (table 6). This gain was statistically significant. Similarly the Control farms increased 12% in average size to 417 acres, also statistically significant. Due to similar changes between matched farmers there was no significant difference between the two groups in acres operated in 1964.

Both groups of farmers also increased their land ownership over the study period (table 7). In 1964 the Program group showed an average 235 acres owned (+3.5%) and the Control group, 228 acres (+11.8%). These changes were not statistically significant for either group, nor was there a significant difference between groups in 1964.

These farm families raised their level of living between 1958 and 1964 as measured by the Home Facilities Index (table 8). Program

families made a significant 29% increase in home facilities; Control families a significant 14% increase. Statistical tests of 1964 differences between pairs of Program families and their matched control families showed these differences to be too small to be significant. At the same time when the cumulative differences in growth for Program farmers average twice that for Control farmers it may be inferred that the Program families were moving toward better family living at a more rapid rate.

The farmers studied also increased the scale of their farm business as measured by gross farm income (table 9). Program farmers showed the greater growth in income between 1958 and 1964. Their average gross income of \$13,451 was a 33% increase over the 1958 average. These 6-year changes were statistically significant. Although the average gross income for the Control group gained 30% to \$10,951, the changes for the individual farmers were too variable to show statistical significance. Despite the greater change among Program farmers, the differences between matched pairs in 1964 were not significant.

The groups' changes in net worth over the study period were the reverse of the changes in gross income (table 10). Here the Control farmers made the significant growth. In 1964 the average net worth of \$36,601 was a 36% increase over 1958. Program farmers also increased in average net worth. Their 1964 average, \$34,951, was a 23% increase

**Table 10. Net Worth for Farm and Home Development Farmers and Control Farmers, 1958 and 1964, Changes and Differences**

Farmer Group	Net Worth		% Change	“t” Value	Level of Significance
	Mean 1958	Mean 1964			
Program Farmers	\$28,321	\$34,951	23.4	1.933	N.S.
Control Farmers	27,001	36,601	35.6	2.339	.05
Difference between Farm Groups	1,320	-1,650			
“t” Value	.421	-.281			
Level of Significance	N.S.	N.S.			

over the 6 years. The changes for Program farmers were not statistically significant. Less change in net worth among the Program farmers may have been due to the higher standard of living they enjoyed in 1964. The goal of better family living was as important in the Farm and Home Development Program as the favorable balance between assets and liabilities. However, the statistical tests showed the differences between the paired farmers in 1964, were not significant.

**Participation in Formal Organizations and Agricultural Programs.** Program farmers participated in

farm organizations to a greater extent than the Control farmers. This was true in 1958 and in 1964. However, both Program and Control groups reduced their levels of participation in formal organizations between 1958 and 1964. The 22% drop in participation in farm organizations among Program farmers was statistically significant (table 11). The Control farmers also decreased their participation in farm groups by 14% (not significant). The lower participation of the Program farmers made the matched pairs “comparable” in the 1964 test, thus negating the statis-

**Table 11. Participation in Farm Organizations by Farm and Home Development Operators and Control Operators, 1958 and 1964, Changes and Differences**

Farmer Group	Operators' Participation		% Change	“t” Value	Level of Significance
	Mean 1958	Mean 1964			
Program Farmers	25.21	19.64	-22.1	-2.644	.02
Control Farmers	19.18	16.48	-14.1	-1.745	N.S.
Difference between Farm Groups	6.03	3.16			
“t” Value	2.128	1.108			
Level of Significance	.05	N.S.			

**Table 12. Participation in Nonfarm Organizations by Farm and Home Development Operators and Control Operators, 1958 and 1964, Changes and Differences**

Farmer Group	Operators' Participation		% Change	"t" Value	Level of Significance
	Mean 1958	Mean 1964			
Program Farmers	8.59	8.18	-4.8	-.411	N.S.
Control Farmers	5.83	5.29	-9.3	-.522	N.S.
Difference between Farm Groups	2.76	2.89			
"t" Value	1.645	1.806			
Level of Significance	N.S.	N.S.			

tically significant difference found in 1958.

Average participation in other community organizations also declined somewhat between 1958 and 1964 (table 12). Program farmers' average declined 5%; the Control average, 9%. These 6-year changes were not significant, nor were the differences between pairs in 1964 significant.

When total participation in farm and nonfarm groups was combined with credit for public offices held, the average score for Program farmers showed a significant 11% decrease (table 13). The Controls al-

so declined 5% from 1958 (not significant). The groups were not significantly different in level of participation in all organizations in 1964.

No explanation for these decreases was found in the data obtained in these surveys. It is possible that the expansion of farming operations as indicated by increased gross incomes in 1964 may have curtailed the time available for social responsibilities. No direct evidence of this was obtained, however.

The 1958-64 changes in average contacts made with Agricultural

**Table 13. Participation in all Organizations by Farm and Home Development Operators and Control Operators, 1958 and 1964, Changes and Differences**

Farmer Group	Operators' Participation		% Change	"t" Value	Level of Significance
	Mean 1958	Mean 1964			
Program Farmers	47.67	42.64	-10.6	-2.091	.05
Control Farmers	38.59	36.72	-4.8	-.818	N.S.
Difference between Farm Groups	9.08	5.92			
"t" Value	1.830	.838			
Level of Significance	N.S.	N.S.			

**Table 14. Contacts Made with Agricultural Stabilization and Conservation Service by Farm and Home Development Operators and Control Operators, 1958 and 1964, Changes and Differences**

Farmer Group	Contacts with ASC		% Change	“t” Value	Level of Significance
	Mean 1958	Mean 1964			
Program Farmers	56.62	54.86	-3.1	-.320	N.S.
Control Farmers	39.75	59.08	48.6	1.713	N.S.
Difference between Farm Groups	16.87	-4.22			
“t” Value	1.957	-.258			
Level of Significance	N.S.	N.S.			

**Table 15. Contacts Made with Soil Conservation Service by Farm and Home Development Operators and Control Operators, 1958 and 1964, Changes and Differences**

Farmer Group	Contacts with SCS		% Change	“t” Value	Level of Significance
	Mean 1958	Mean 1964			
Program Farmers	42.08	29.02	-31.0	-2.015	.05*
Control Farmers	23.32	29.72	27.4	.760	N.S.
Difference between Farm Groups	18.76	-.70			
“t” Value	2.198	-.092			
Level of Significance	.05	N.S.			

\*Approaches  $P < .05$

**Table 16. Contacts Made with County Extension Agent by Farm and Home Development Operators and Control Operators, 1958 and 1964, Changes and Differences**

Farmer Group	Contacts—Ext. Agent		% Change	“t” Value	Level of Significance
	Mean 1958	Mean 1964			
Program Farmers	127.64	110.94	-13.1	-1.141	N.S.
Control Farmers	34.91	48.83	39.9	1.498	N.S.
Difference between Farm Groups	92.73	62.11			
“t” Value	6.429	2.620			
Level of Significance	.001	.02			

Agents took different directions for each group; the Program farmers decreased; the Control farmers increased.

Program farmers had considerable more contacts with the Agricultural Stabilization and Conservation Service than did the Control farmers in the early part of the program (1958). Between 1958 and 1964 the Program farmers contacts with this agency declined slightly (3.1%). However, by the end of the study, the two groups were quite similar in the number of contacts made (table 14). Neither set of changes was statistically significant. It may be surprising that the 49% change in average contacts for Control farmers failed to show statistical significance. Study of the individual observations in each study year showed that while Control farmers increased contacts on the average, the changes from individual to individual were irregular.

This pattern of inconsistent change in number of contacts among Control farmers also resulted in varying differences between the matched pairs in 1964. Therefore, statistical tests comparing the two groups yielded no significant differences.

Services obtained from the Soil Conservation Service also declined for Program Farmers over this 6-year time span (table 15). Furthermore, their 31% average drop in contacts was statistically significant. Control farmers increased contacts with this agency an average 27% (not significant). These changes reduced the 1958 differences be-

tween the Program and Control pairs to the point that there was no significant difference between groups in 1964.

Neither the 13% reduction of the Program group, nor the 40% increase of the Control group was associated with statistically significant changes in average contacts with the County Extension Agent (table 16). Furthermore, despite the 1958-64 changes, the Program farmers had more than twice as many contacts with this agent than Control farmers. As a result, the Program group maintained a significantly higher level of contacts with the County Extension Agent in 1964.

Program farmers also reduced their contacts with the Farm and Home Development Agent significantly by an average of 42% during the 6-year period (table 17). This is not necessarily indicative of less cooperation between client and agent. During the early years of the program, more person-to-person contact was necessary for the development of long-range farm plans. It was expected that Program farmers would pass on to more independent stages of operation. This rationale may also explain the other decreases in average contacts between Program farmers and agricultural agents.

When the contacts with all Extension and agricultural agencies were combined into one summary score, the same pattern of change and difference was evident (table 18). Program farmers significantly lowered their rate of contact by an

average 24%; Control farmers significantly raised by an average 40%. Nevertheless Program farmers were participating in all Agricultural programs in 1964 at a rate twice that of the Control farmers. Therefore, the 1964 comparison of pairs showed the Program group

significantly higher in total contacts with all agents.

**Recommended Farm Practices.** Changes and differences were measured for three dimensions of adoption: Knowledge of, Attitude Toward, and Adoption of Recommended Farm Practices.

**Table 17. Contacts Made with Farm Home Development Agent by Program Farmers in 1958 and 1964**

Farmer Group	Contacts—FHD Agent		% Change	“t” Value	Level of Significance
	Mean 1958	Mean 1964			
Program Farmers	157.05	91.70	-41.6	-3.641	.001

**Table 18. Total Contacts Made with Extension and Agricultural Agencies by Farm and Home Development Farmers and Control Farmers, 1958 and 1964, Changes and Differences**

Farmer Group	Contacts—All Agents		% Change	“t” Value	Level of Significance
	Mean 1958	Mean 1964			
Program Farmers	376.40	285.30	-24.2	-2.925	.01
Control Farmers	98.24	137.61	40.1	2.030	.05
Difference between Farm Groups	278.16	147.69			
“t” Value	7.858	3.441			
Level of Significance	.001	.01			

**Table 19. Knowledge of Basic Farm Information for Farm and Home Development Farmers and Control Farmers, 1958 and 1964, Changes and Differences**

Farmer Group	Knowledge Score		% Change	“t” Value	Level of Significance
	Mean 1958	Mean 1964			
Program Farmers	77.67	66.54	-14.3	-4.520	.001
Control Farmers	72.75	64.97	-10.7	-2.404	.05
Difference between Farm Groups	4.92	1.57			
“t” Value	1.587	.399			
Level of Significance	N.S.	N.S.			

Farmers' knowledge of basic farm information, as measured by the 1958 and the 1964 answers to the same 19 questions, declined significantly for both groups (table 19). The Program farmers' scores dropped an average 14%; the Control farmers' an average 11%. Even though the Program farmers were higher in knowledge in both years, there was no significant difference between the two groups in either 1958 or 1964. It is difficult to explain this decline in knowledge. Possibly the information used in testing here had been disseminated through mass media to a greater extent in 1958.

Changes in farmers' attitudes toward recommended farm practices were slight (table 20). Program average attitude increased 2%; Control attitude increased 4%. The 1964 comparison showed the Program farmers still had significantly more favorable attitudes toward these farm practices.

Findings on the adoption of 26 recommended farm practices showed changes in both directions for

each group. In an attempt to measure both qualitative and quantitative changes, the adoption results were analyzed in three ways:

- to discover the directions of change — adoption or discontinuance of recommended practices — for farmers in each group by type of enterprise;
- to determine the distribution according to "High" and "Low" scores by enterprise;
- to estimate the total change for each group and differences between the two in 1964 when the recommended practices were combined.

In the "direction" analysis, farmers were divided in the following manner. Those who increased in adoption score between 1958 and 1964 were classed *adopters*; those with no change, *same level*; those who decreased, *discontinuers*. Comparisons of the two groups showed more *adopters* among Pro-

Table 20. Attitudes Toward Recommended Farm Practices of Farm and Home Development Farmers and Control Farmers, 1958 and 1964, Changes and Differences

Farmer Group	Attitude Score		% Change	"t" Value	Level of Significance
	Mean 1958	Mean 1964			
Program Farmers	81.54	83.16	2.0	.750	N.S.
Control Farmers	70.59	73.16	3.9	.842	N.S.
Difference between Farm Groups	10.95	10.00			
"t" Value	2.990	2.515			
Level of Significance	.01	.02			

gram farmers in dairy and swine practices, in all livestock practices, and all farm practices combined (table 21). On the other hand, Control farmers had higher rates of

adoption *and* higher rates of discontinuance in poultry and sheep practices.

To determine whether adoption occurred more frequently among

**Table 21. Changes in Level of Adoption of Recommended Farm Practices by Adoption Score for Farm and Home Development Farmers and Control Farmers Between 1958 and 1964**

Recommended Practices	All Scores		High Scores—1958		Low Scores—1958	
	Program Farmers	Control Farmers	Program Farmers	Control Farmers	Program Farmers	Control Farmers
Poultry Practices						
Adopters (%)	46	53	33		60	89
Same Level (%)	27	7	17	17	40	
Discontinuers (%)	27	40	50	83		11
(N)	(11)	(15)	(6)	(6)	(5)	(9)
Dairy Practices						
Adopters (%)	50	46	14		73	58
Same Level (%)	22	27	28	33	18	25
Discontinuers (%)	28	27	58	67	9	17
(N)	(18)	(15)	(7)	(3)	(11)	(12)
Swine Practices						
Adopters (%)	36	10			83	25
Same Level (%)	36	30	62	33		25
Discontinuers (%)	28	60	38	67	17	50
(N)	(14)	(10)	(8)	(6)	(6)	(4)
Sheep Practices						
Adopters (%)	40	43	33		50	100
Same Level (%)	40	14	33	25	50	
Discontinuers (%)	20	43	33	75		
(N)	(5)	(7)	(3)	(4)	(2)	(3)
All Livestock Practices						
Adopters (%)	44	40	17		71	68
Same Level (%)	29	20	38	26	21	14
Discontinuers (%)	27	40	45	74	8	18
(N)	(48)	(47)	(24)	(19)	(24)	(28)
General Farming Practices						
Adopters (%)	40	40	27	12	67	59
Same Level (%)	10	18	11	19	8	18
Discontinuers (%)	50	42	62	69	25	23
(N)	(38)	(38)	(26)	(16)	(12)	(22)
All Practices						
Adopters (%)	42	40	22	6	69	64
Same Level (%)	21	19	24	23	17	16
Discontinuers (%)	37	41	54	71	14	20
(N)	(86)	(85)	(50)	(35)	(36)	(50)



those with high or with low rates of adoption in the earlier period, controls for high and low scores were introduced. Among farmers who were high in 1958, the Program group showed more adoptions and fewer discontinuances than the Control high's in all of the livestock practices and general farming practices. This was also true among the Program low's except for poultry and sheep practices.

Distribution of the farmers using the practices included under general farming in 1958 and in 1964 showed the nature of adoptions and discontinuances in this category (table 22). All of the Program farmers said they used soil tests to determine their fertilizer needs, although in 1964, 21% had not tested their soil for 3 years. Almost all of them (95%) used a complete test checking for nitrogen, phosphate,

and potash. A few Program farmers began using their farm account book to study during this period. The Program farmers who renovated pasture by plowing, reseeding and fertilizing, doubled in number. On the remaining practices there was little or no change in the proportion of Program adoptions. Control farmers showed increased adoptions of soil testing, including use of complete soil tests, and their knowledge of the reasons for testing soil. Eight percent of the Control group began keeping records with a Farm Account Book but 13% discontinued appraising their farming business from their records. The 1964 comparison of rate of adoption of general farming practices showed the Program farmers with a higher rate of use of these recommended practices.

**Table 22. Percent of Farm and Home Development Program Farmers and Control Farmers Using Recommended General Farming Practices 1958 and 1964**

Recommended Farm Practices	1958		1964	
	Program Farmers	Control Farmers	Program Farmers	Control Farmers
	%	%	%	%
Grew rangeland or vernal alfalfa .....	58	40	55	34
Used hay crop mixture of alfalfa with brome or wheat grass .....	82	66	76	66
Ground some of Grain .....	92	90	90	86
Tested soil for fertilizer needs .....	100	68	100	87
Soil test within last three years .....	100	68	79	68
Complete Soil Test (Nitrogen, Phosphate, and Potash) .....	95	68	95	87
Fertilizer requirements given as reason for Soil Test .....	68	55	68	68
Records by Farm Account Book .....	94	79	92	87
Used Records to Study Farm Business .....	82	79	87	66
Some of Pasture renovated by Plowing, Reseeding and Fertilizing in last three years	19	20	40	21

The second indicator of the direction of changes in adoption of recommended farm practices was the distribution of high and low adoption scores for each group in 1958 and 1964 (table 23). The results of this analysis gave no clear-cut differences from which to draw inferences, however. More farmers in both groups showed high scores

in poultry, dairy, and sheep practices in 1964. The same proportion of Program farmers was high in both years in the adoption of recommended swine and general farming practices. Half of the Control farmers who were high on swine practices in 1958 dropped to low in 1964.

Some farmers in both groups dis-

**Table 23. Percentage Distribution of Adoption of Recommended Practices Scores for Farm and Home Development Farmers and Control Farmers, 1958 and 1964**

Recommended Practices	High Scores		Low Scores	
	Program Farmers	Control Farmers	Program Farmers	Control Farmers
	%	%	%	%
Poultry Practices*				
1958 .....	55	40	45	60
1964 .....	64	60	36	40
Dairy Practices*				
1958 .....	65	27	35	73
1964 .....	45	53	55	47
Swine Practices*				
1958 .....	57	60	43	40
1964 .....	57	30	43	70
Sheep Practices*				
1958 .....	60	57	40	43
1964 .....	80	86	20	14
All Livestock Practices				
Farmers: Dropped Livestock Enterprise by 1964				
1958 .....	24	41	76	59
Farmers: Added Livestock Enterprise by 1964				
1964 .....	44	25	56	75
Farmers: All Livestock*				
1958 .....	50	43	50	57
1964 .....	56	55	44	45
General Farming Practices				
1958 .....	68	42	32	58
1964 .....	68	45	32	55
All Practices				
1958 .....	58	46	42	54
1964 .....	62	54	38	46

\*Includes only farmers with this type of livestock both 1958 and 1964.

continued livestock enterprises, and some added livestock enterprises between periods. These farmers were omitted in the distributions described above. Among Program farmers, 75% of those who discontinued a livestock enterprise were low in their use of recommendations in 1958. On the other hand, among Control farmers who dropped an enterprise, 60% were low in adoption. The Program farmers who added one or more livestock enterprises were fairly well divided between high and low adoption, 44% and 56%, respectively. Control farmers who added an enterprise

were more likely to enter at a low rate of adoption, 25% high, 75% low. This is an indication of sound farm planning among the Program farmers. It appears that many of those with marginal operations in specific classes of livestock discontinued the enterprise. Furthermore, almost half of those who established an additional livestock enterprise acquired information about efficient methods of production and put this knowledge into practice.

In general, a larger proportion of Control farmers moved from low adoption scores in 1958 to high scores in 1964. However, slightly

**Table 24. Adoption of Recommended Farm Practices by Farm and Home Development Farmers and Control Farmers, 1958 and 1964, Changes and Differences.**

Farmer Group	Adoption Score		% Change	“t” Value	Level of Significance
	Mean 1958	Mean 1964			
Program Farmers	63.74	65.39	2.4	.834	N.S.
Control Farmers	59.82	59.68	-0.2	-.045	N.S.
Difference between Farm Groups	3.92	5.71			
“t” Value	1.318	2.011			
Level of Significance	N.S.	.05			

**Table 25. Adoption Index for Farm and Home Development Farmers and Control Farmers, 1958 and 1964, Changes and Differences**

Farmer Group	Adoption Index		% Change	“t” Value	Level of Significance
	Mean 1958	Mean 1964			
Program Farmers	74.21	72.05	-2.9	-1.507	N.S.
Control Farmers	67.63	65.58	-1.6	-1.031	N.S.
Difference between Farm Groups	6.58	6.47			
“t” Value	3.025	2.661			
Level of Significance	.01	.02			

more of the Program farmers were high in most enterprises both in 1958 and in 1964.

The summary score for the adoption of all recommended farm practices showed a 2.4% increase (not significant) among Farm and Home Development farmers and a 0.2% decrease (not significant) among Control farmers (table 24). The 1964 difference between the pairs was statistically significant, with the Program farmers showing a somewhat higher level of adoption.

The knowledge, attitude, and adoption scores of each farmer were combined to give an Adoption Index, or a measure of their "prone-

ness" toward making recommended changes (table 25). The average Adoption Index for Program farmers dropped 3% (not significant); the Control farmers dropped 2% (not significant) over the 6 years. This change was due, of course, to the decline in their knowledge of basic farm information. The Program farmers remained significantly higher in the 1964 pair comparisons.

**Fertilizer Scores.** Responses to eight fertilizer practice questions and two knowledge questions in 1964 differed little from the 1958 responses for either group (table 26). A small number of Program

**Table 26. Fertilizer Responses for Farm and Home Development Program Farmers and Control Farmers, 1958 and 1964**

Fertilizer Item	1958		1964	
	Program Farmers	Control Farmers	Program Farmers	Control Farmers
Use recommended rate of application .....	%	%	%	%
Used fertilizer for				
2 years or less .....				3
3 years or more .....	100	100	100	97
Use starter fertilizer for corn .....	84	76	81	76
Leave a check strip when fertilizing a field ....	100	88	92	57
Apply at least 20 pounds of nitrogen and phosphorous to small grain .....	75	47	67	51
Nitrogen and phosphorous applied by				
Top dressing .....	4	25	4	
Broadcasting prior to seeding .....	50	37	25	11
Grain drill attachment .....	46	38	71	89
Apply at least 40 pounds of nitrogen to corn ..	47	47	57	57
Nitrogen applied by plowdown, side dressing, broadcast .....	100	100	96	100
Fertilizer causes burning of crops when moisture is limited .....	84	59	81	59
If fertilizer increases yields, lowers cost of production .....	100	88	97	84

farmers adopted the practices of applying fertilizer to small grain with a grain drill attachment, and applying at least 40 pounds of fertilizer to corn. On the other hand, some discontinued using the recommended rate of fertilizer application, using starter fertilizer for corn, leaving a check strip, and applying at least 20 pounds of nitrogen and phosphorous to small grain. The Control farmers also showed adoptions in applying at least 20 pounds of nitrogen and phosphorous to small grain

fields, using a grain drill attachment, and applying at least 40 pounds of nitrogen to corn. Their discontinuances included using the recommended rate of fertilizer and leaving a check strip in fertilized fields. Most of these changes were small except for the 51% adoption of the practice of applying fertilizer with a grain drill attachment, and the 31% discontinuance of the practice of leaving check strips by the Control farmers. Both groups displayed about the same level of

**Table 27. Fertilizer Score for Farm and Home Development Farmers and Control Farmers, 1958 and 1964, Changes and Differences.**

Farmer Group	Fertilizer Score		% Change	“t” Value	Level of Significance
	Mean 1958	Mean 1964			
Program Farmers	9.94	10.49	5.5	.597	N.S.
Control Farmers	9.00	9.24	2.7	1.673	N.S.
Difference between Farm Groups	.94	1.25			
“t” Value	.899	1.992			
Level of Significance	N.S.	.05*			

\*Approaches  $P < .05$

**Table 28. Attitude Toward South Dakota Agricultural Programs of Farm and Home Development Farmers and Control Farmers, 1958 and 1964, Changes and Differences**

Farmer Group	Attitude— Agricultural Programs		% Change	“t” Value	Level of Significance
	Mean 1958	Mean 1964			
Program Farmers	81.56	78.39	-3.9	-1.540	N.S.
Control Farmers	72.18	70.28	-2.6	-.449	N.S.
Difference between Farm Groups	9.38	8.11			
“t” Value	3.336	2.213			
Level of Significance	.01	.05			

knowledge on the last two fertilizer items.

Comparisons of the two groups showed the Program farmers slightly higher in both years for most of the items. This pattern was also evident in the results of the statistical tests (table 27). The change for the Program farmers (average 5.5%) was about twice the change for the Control farmers (average 2.7%). The differences between the matched pairs in 1964 were large enough to be significant with the Program farmers higher in adoption of fertilizer.

**Attitudes toward South Dakota Agricultural Services.** Responses given in 1964 to seven questions measuring the farmers' appraisal of the value of services given by the Agricultural Experiment Station, County Agricultural Stabilization and Conservation Service, Soil Conservation Service, and County Extension Service showed little change from the 1958 responses (table 28). Farmers in both groups tended to hold somewhat less favorable opinions in the later period. However, the Program farmers' average score was significantly higher than the Control average in both years.

On the other hand, the average attitude of Program farmers toward

the Farm and Home Development Program was a good deal more favorable in 1964 (table 29). Generally, these farmers felt the program had been successful, and that Farm and Home Development should be extended to all Deuel County Farmers. Many felt it should be extended over all of South Dakota.

These farmers were asked what they thought was the best contribution of the program and how they personally had been helped the most. The most frequently mentioned benefit was the encouragement and knowledge gained in proper use of fertilizer. Next, was the information gained regarding the benefits of soil testing and soil conservation. Almost all said they felt the program had helped them to increase production and farm income.

Many Program farmers also had suggestions for improving Farm and Home Development. Several felt the program should be extended to include more farmers, and that both TVA cooperation and intensive contacts should be extended over a longer period of time. More contacts by the agent with the farmer "at home" were thought important, and a few mentioned adding another trained man to relieve the pressure on the present development agent. Several felt

**Table 29. Attitude Toward Farm and Home Development Program of Participating Farmers, 1958 and 1964, and Change**

Farmer Group	Attitude—FHD		% Change	“t” Value	Level of Significance
	Mean 1958	Mean 1964			
Program Farmers	68.37	78.81	15.3	4.229	.001

there needed to be more help with farm home planning.

## CONCLUSIONS

The major hypothesis tested by this evaluation study was that the FHD Program implemented more recommended changes in the group of participating farmers than could be observed in a control group of nonparticipating farmers in Deuel County between 1958 and 1964. The statistical findings of the before-after measurements justify both the acceptance and rejection of this hypothesis. Conclusions based on these findings are presented according to economic, participation, and adoption variables.

### Economic

Economic growth among Program farmers was indicated by increased acreage operated, level of living, and gross farm income. During the same period their matched partners showed significant growth in acreage operated, level of living and net worth. Even though the Program farmers showed larger percentage increases on most of these economic measurements, they showed no significant advantage over the Control farmers in 1964. For this reason, no statistical evidence of the effect of the 6-year Program was discernable in the economic variables measured.

### Participation

Program farmers were participating in all agricultural programs in 1964 at a rate twice that of the Control farmers even though between 1958 and 1964 there had been

a decline in participation in these agencies by the Program farmers and an increase in participation by the Control farmers.

The comparison of the two groups in 1964 indicated that the Program farmers participated in farm and nonfarm organizations to a greater extent than did the Control farmers. However, the amount of participation by both groups in these organizations declined between 1958 and 1964.

Frequency of contacts with county agricultural agents had also declined in 1964 for Program farmers. Again, the timing of the 1958 study may have influenced these findings. If the program were effective in motivating farmers to make more extensive use of Agricultural Stabilization and Conservation, Soil Conservation, County Extension, and Farm and Home Development agents, the greatest number of contacts could be expected during the 18 months' period following the start of the Farm and Home Development program in 1956 and the first part of this study in 1958. The second year of the Program (1958) should have found these operators making more extensive use of the services of these agencies, than would be expected after the majority of changes had taken place.

During the study period 1958 to 1964 the Program farmers continued a higher level of contact with the county agents than did the Control farmers. However, the Control farmers were making more extensive use of county agents' services at the end than at the beginning of

the study period. Furthermore, when contacts with all agents were combined, the Program group showed a higher level of participation in all agricultural services. Therefore, the Farm and Home Development program can be credited, indirectly at least, with influencing participating farmers to maintain a higher level of contact than the Control farmers.

### **Adoption of Recommended Farm Practices**

Changes in Program farmers' knowledge of basic farm information showed a negative direction. Although, as previously stated, the factual items used for testing knowledge may not have been as pertinent in 1964 as in 1958, there was no evidence that they gained more knowledge than the Control farmers between 1958 and 1964, or had a higher degree of knowledge in 1964.

Little change was seen in attitudes toward adopting recommended farm practices. Even though the Program farmers held somewhat more favorable attitudes toward these changes than the Control group in 1964, the effect of Farm and Home Development over 6 years was not too apparent.

The influence of the change program was apparent in the increased level of adoption among Program farmers. These farmers showed more adoptions and fewer discontinuances in each livestock enterprise than Control farmers. They also held considerable margins over Control farmers in use of practices including growing the recom-

mended varieties of alfalfa, hay crop mixture, obtaining a complete soil test since 1961, renovating at least part of their pastures since 1961, and in using farm records to study their farm business.

In addition, the Program farmers showed increased use of fertilizer at recommended rates. They exceeded their matched Controls on use of the recommended rates of application on small grain and corn, in method of application, employing a check strip, and in knowledge of results obtained from fertilizer use.

The 1964 comparisons of the Program and Control farmers showed the Program farmers higher on adoption of recommended livestock practices and general farm practices, and higher in following the recommendations for the use of fertilizer. Here the influence of Farm and Home Development can be noted from the more frequent changes made, and in the higher level of farm technology reached by the Program farmers in 1964.

### **Evaluation of Program**

The primary objectives of the Farm and Home Development program were to encourage and assist the participating families in planning changes in farm and home management designed to reach higher efficiency, a higher economic level and a higher level of family living. There are a number of indications that progress was made in this direction.

The comparative rates of change between the Program farmers and the Control farmers in the 1958-64



period as measured in this study showed a generally consistent advantage in favor of the farm families participating in the program. These farmers had adopted more recommended farm practices and in consequence had reached a higher level of operating efficiency. Often the economic rewards for changes effected are relatively low initially, and increase at an increasing rate over time. Other rewards for increased efficiency can be higher output from the same amount of labor, or increased leisure time.

The Program farmers showed a more favorable attitude toward adopting new methods and to attaining knowledge from Extension personnel. Agriculture is a dynamic industry, and the individual farmer must be willing and able to adapt to changing conditions. The favorable attitudes of these farmers indicate that they are more likely to be adoptable to changing conditions.

The expressions of the farmers who participated in the Program generally indicated that in their opinion the Farm and Home Development program was valuable to them. Nearly all farmers questioned expressed the need for continued service of this type, as well as the belief that the Program should be extended to other farmers in the area. While a few of the respondents perceived the program as primarily fertilizer promotion, most of them recognized the larger overall goal of the Extension effort. Most of the operators gave the program credit for their increased grain and livestock production.

Several specifically mentioned better farm living resulting from management decisions reached through the help of the agent and other participating farmers.

Certain limitations of the evaluation study precluded measuring all the results of the Program. First, there are many ways to measure economic development and better family living. This study was necessarily limited to five of these ways. For example, no attempt was made here to measure the level of satisfaction with farm life, or rate of realization of family goals.

Second, the design of this study restricted dynamic analysis. The 1958 questionnaire was refined to yield a valid measurement of the original goals of the Program. Knowledge and adoption items were drawn up with help of specialists in the various farming areas, and consultation with Extension personnel who delineated the program goals. However, any successful program must be flexible in adjusting specific aims in order to meet changing needs of the participants. Omissions of other charges, possibly equally important as those described, were generic to carrying out the original design. For example, the three dimensions of adoption were measured according to facts and practices important to farming technology in 1958. The nature of this study prohibited additions and/or omissions to include facts and practices which, by 1964, may have become more important than those derived for the questionnaire in 1958.

Third, no measure was made of the influence which Program farmers had upon Control farmers. Evidence of the results of the Program changes should have been apparent to many of the Control farmers. It was expected that the experimental group would be a source of diffusion to other farmers in their locality. Some of the change among Control farmers, then, can probably be attributed to the changes demonstrated effective by Program farmers. Accuracy in measuring changes and differences would have been increased had some control of the influence of diffusion been introduced.

Fourth, at least some degree of error was incurred in the delayed "before" measurements of characteristics of the participating farmers in 1958. Both quality and quantity of changes in the first 2 years were lost to measurement. It is recommended that future evaluation studies of this nature be initiated before the "treatment" has been applied. The influence of the Program may have been more precisely measured if the participating farmers had been selected to more closely simulate the normal distribution of economic characteristics of

Deuel County farmers. Because the 45 families selected possessed many characteristics of "early adopters," the matched farmers then could be expected to show above average changes toward reaching the goals set up by the development program. A more representative sample of farmers to participate in Farm and Home Development would have reduced the change-prone bias found among the matched group.

The final evaluation of the effectiveness of the Program should include consideration of the results of this before-after study. While the findings of this study gave no direct evidence that Program farmers had realized any greater degree of economic development and better family living than farmers who had not participated, there was evidence that Program farmers can be expected to reach these economic and family goals more readily than comparable farmers to whom only conventional Extension services are available. Not only their changes in farming methods, but their more favorable attitudes and more extensive use of Extension services makes the fulfillment of Program goals highly probable.

## APPENDIX TABLES

**Table A1. Comparison of Farm and Home Development Program Farmers with Matched Farmers, 1958**

Variable	N	Mean of Program Farmers	Mean of Matched Farmers	"t" Test	Significance Level of "t"
1. Age—Operator	35	1.77	1.85	-.594	N.S.
2. Age—Homemaker	33	1.45	1.69	-1.436	N.S.
3. Education—Oper.	34	2.17	2.17	.000	N.S.
4. Education—Hmkr.	33	2.69	2.69	.000	N.S.
5. No. Yrs. Farming	37	1.45	1.64	-.852	N.S.
6. Size of Family	35	2.34	2.00	1.921	N.S.
7. Family Cycle	33	3.69	3.72	-.086	N.S.
8. Gross Income	36	5.02	4.61	1.473	N.S.
9. Additional Income	36	.11	.02	1.783	N.S.
10. Net Worth	36	5.86	5.75	.421	N.S.
11. Home Facilities	36	2.50	2.41	.367	N.S.
12. Acres Operated	37	3.64	3.72	-.291	N.S.
13. Acres Owned	37	1.51	1.35	.722	N.S.
14. % Acres Owned	37	63.37	54.40	1.224	N.S.
<b>Participation in Organizations</b>					
15. Farm Org.—Oper.	37	25.21	19.18	2.128	.05
16. Farm Org.—Hmkr.	17	8.52	8.23	.124	N.S.
17. Nonfarm—Oper.	37	8.59	5.83	1.645	N.S.
18. Nonfarm—Hmkr.	17	5.82	4.47	.574	N.S.
19. Total Org.—Oper.	37	47.67	38.59	1.830	N.S.
20. Total Org.—Hmkr.	17	26.94	32.35	-.870	N.S.
<b>Contacts with Agricultural Agents</b>					
21. Con.—A.S.C.	38	55.24	39.47	1.867	N.S.
22. Con.—S.C.S.	37	42.08	23.32	2.198	.05
23. Con.—Co. Agent	37	127.64	34.91	6.429	.001
25. Total Contacts	37	376.40	98.24	7.858	.001
<b>Farm Practices</b>					
26. Adoption—F. Prac.	38	63.74	59.82	1.318	N.S.
27. Knowledge—F.P.	37	77.67	72.75	1.587	N.S.
28. Attitude—F.P.	37	81.54	70.59	2.990	.01
29. Total —					
Adop., Know., Attit.	38	74.21	67.63	3.025	.01
30. Fertilizer Score	15	9.94	9.00	.899	N.S.
31. Hmkr. Participation					
Extension	17	7.64	10.29	-.622	N.S.
32. Attit. to Extension—					
Oper.	37	81.56	72.18	3.336	.01
33. Attit. to Ex.-Hmkr.	6	5.50	5.83	-.790	N.S.
35. Att. to 4H—Hmkr.	4	7.00	5.50	1.566	N.S.
36. Att. Fed. Education					
Programs—Hmkr.	17	15.11	14.35	.601	N.S.
37. Homemaking Prac.	17	17.29	18.82	-.551	N.S.
38. Homemaking Know.	17	10.29	9.76	.771	N.S.

**Table A2. Comparison of Farm and Home Development Program Farmers in 1958 with 1964**

Variable	N	Mean for 1958	Mean for 1964	"t" Test	Significance Level of "t"
7. Family Cycle	35	3.65	4.17	3.895	.001
8. Gross Income	37	5.10	5.70	4.035	.001
9. Additional Income	37	.10	.13	.572	N.S.
10. Net Worth	37	5.91	6.37	1.933	N.S.
11. Home Facilities	36	2.50	3.02	3.748	.001
12. Acres Operated	37	3.64	4.02	3.035	.01
13. Acres Owned	37	1.51	1.56	.529	N.S.
14. % Acres Owned	37	63.37	61.51	-.550	N.S.
<b>Participation in Organizations</b>					
15. Farm Org.—Oper.	37	25.21	19.64	-2.644	.02
16. Farm Org.—Hmkr.	36	6.36	6.36	.000	N.S.
17. Nonfarm—Oper.	37	8.59	8.18	-.411	N.S.
18. Nonfarm—Hmkr.	36	3.97	4.83	.944	N.S.
19. Total Org.—Oper.	38	47.65	42.07	-2.0914	.05
20. Total Org.—Hmkr.	36	25.52	29.02	1.535	N.S.
<b>Contacts with Agricultural Agents</b>					
21. Con.—A.S.C.	37	56.62	54.00	-.320	N.S.
22. Con.—S.C.S.	38	41.45	27.70	-2.015	.05*
23. Con.—Co. Agent	37	127.64	109.41	-1.141	N.S.
24. Con.—FHD Agent	37	157.05	91.70	-3.641	.001
25. Total Contacts	37	376.40	279.89	-2.925	.01
<b>Farm Practices</b>					
26. Adoption	38	63.74	65.39	1.318	N.S.
27. Knowledge	37	77.67	66.54	-4.520	.001
28. Attitude toward	37	81.54	83.16	.754	N.S.
29. Total—					
Adop., Know., Attit.	38	74.21	72.05	-1.507	N.S.
30. Fertilizer Score	33	9.49	10.49	.597	N.S.
31. Hmkr. Participation in Extension	34	6.79	10.41	2.283	.05
32. Attit. to Extension—Oper.	37	81.56	78.13	-1.540	N.S.
33. Attit. to Ex.—Hmkr.	15	5.93	5.00	-1.895	N.S.
34. Attit. FHDev.—Op.	37	68.37	78.81	4.229	.001
35. Att. 4H—Hmkr.	19	6.84	6.57	-.482	N.S.
36. Att. Fed. Education Programs—Hmkr.	35	14.71	14.34	-.472	N.S.
37. Homemaking Prac.	35	17.34	17.97	.661	N.S.
38. Homemaking Know.	34	9.82	9.61	-.583	N.S.

\*Appr.

**Table A3. Comparison of "Match" (Non-Program) Farmers in 1958 with 1964**

Variable	N	Mean for 1958	Mean for 1964	"t" Test	Significance Level of "t"
7. Family Cycle	35	3.65	4.57	6.098	.001
8. Gross Income	35	4.65	5.14	1.653	N.S.
9. Additional Income	35	.02	.22	1.420	N.S.
10. Net Worth	35	5.74	6.40	2.339	.05
11. Home Facilities	36	2.44	2.77	2.645	.02
12. Acres Operated	37	3.72	4.08	3.163	.01
13. Acres Owned	37	1.35	1.51	1.027	N.S.
14. % Acres Owned	37	54.40	59.32	.870	N.S.
<b>Participation in Organizations</b>					
15. Farm Org.—Oper.	37	19.18	16.48	-1.745	N.S.
16. Farm Org.—Hmkr.	18	8.72	7.83	-.516	N.S.
17. Nonfarm—Oper.	37	5.83	5.29	-.552	N.S.
18. Nonfarm—Hmkr.	18	4.55	5.83	.691	N.S.
19. Total Org.—Oper.	37	38.59	36.72	-.818	N.S.
20. Total Org.—Hmkr.	18	32.77	31.11	-.426	N.S.
<b>Contacts with Agricultural Agents</b>					
21. Con.—A.S.C.	36	40.52	59.08	1.713	N.S.
22. Con.—S.C.S.	36	23.97	29.72	.760	N.S.
23. Con.—Co. Agent	36	35.44	48.83	1.498	N.S.
25. Total Contacts	37	98.59	135.30	2.030	.05
<b>Farm Practices</b>					
26. Adoption	38	59.82	59.68	-0.045	N.S.
27. Knowledge	37	72.75	64.97	-2.404	.05
28. Attitude toward	37	70.59	73.18	.842	N.S.
29. Total —					
Adop., Know., Attit.	38	67.63	65.58	-1.031	N.S.
30. Fertilizer Score	17	9.00	9.24	1.673	N.S.
31. Hmkr. Participation in Extension	18	11.44	9.94	-.624	N.S.
32. Attit. to Extension—Oper.	37	72.18	71.24	-.449	N.S.
33. Attit. to Ext.-Hmkr.	10	5.90	5.50	-.937	N.S.
35. Att. 4H—Hmkr.	8	7.12	6.75	-1.157	N.S.
36. Att. Fed. Education Programs—Hmkr.	18	14.55	14.77	.234	N.S.
37. Homemaking Prac.	18	18.55	15.77	-1.263	N.S.
38. Homemaking Know.	18	9.66	9.77	.356	N.S.

**Table A4. Comparison of Farm and Home Development Program Farmers with Matched Farmers, 1964**

Variable	N	Mean of Program Farmers	Mean of Matched Farmers	"t" Test	Significance Level of "t"
6. Size of Family	36	2.33	2.02	1.722	N.S.
7. Family Cycle	34	4.17	4.67	-1.423	N.S.
8. Gross Income	36	5.69	5.19	1.357	N.S.
9. Additional Income	36	.13	.22	-.551	N.S.
10. Net Worth	36	6.33	6.44	-.287	N.S.
11. Home Facilities	35	3.00	2.74	1.271	N.S.
12. Acres Operated	37	4.02	4.08	-.208	N.S.
13. Acres Owned	37	1.56	1.51	.243	N.S.
14. % Acres Owned	37	61.51	59.32	.257	N.S.
<b>Participation in Organizations</b>					
15. Farm Org.—Oper.	37	19.64	16.48	1.108	N.S.
16. Farm Org.—Hmkr.	35	6.37	6.08	.196	N.S.
17. Nonfarm—Oper.	37	8.18	5.29	1.806	N.S.
18. Nonfarm—Hmkr.	35	4.80	3.65	.819	N.S.
19. Total Org.—Oper.	37	42.64	36.72	1.121	N.S.
20. Total Org.—Hmkr.	35	28.85	25.40	1.034	N.S.
<b>Contacts with Agricultural Agents</b>					
21. Con.—A.S.C.	36	54.86	59.08	-.353	N.S.
22. Con.—S.C.S.	36	29.02	29.72	-.092	N.S.
23. Con.—Co. Agent	36	110.94	48.83	2.620	.02
25. Total Contacts	36	285.30	137.61	3.441	.01
<b>Farm Practices</b>					
26. Adoption	38	65.39	59.68	2.011	.05*
27. Knowledge	37	66.54	64.97	.399	N.S.
28. Attitude	37	83.16	73.18	2.515	.02
29. Total — Adop., Know., Attit.	38	72.05	65.58	2.661	.02
30. Fertilizer Score	37	10.49	9.24	1.992	.05*
31. Hmkr. Participation in Extension	34	10.58	* 7.76	1.436	N.S.
32. Attit. to Extension— Oper.	38	78.39	70.28	2.213	.05
33. Att. to Ext.—Hmkr.	10	5.35	5.00	.563	N.S.
35. Att. 4H—Hmkr.	14	6.42	6.14	.551	N.S.
36. Att. Fed. Education Programs—Hmkr.	35	14.28	14.05	.212	N.S.
37. Homemaking Practices	35	18.65	17.22	.610	N.S.
38. Homemaking Know.	34	9.67	9.35	.752	N.S.

\*Appr.

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