AN EDUCATIONAL PROGRAM IN VOCATIONAL AGRICULTURE IN SOIL CONSERVATION AND MANAGEMENT FOR FARM FAMILIES IN THE MARLAND COMMUNITY

By

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CHAPTER I

INTRODUCTION

Over a period of many years teachers of vocational agriculture through vocational agriculture departments in the public schools have been charged with the responsibility of providing an educational program in agriculture for both farm boys enrolled in high school and adult farmers of their respective communities. Consequently, the quality and success of these programs have been of major interest to public school officials and patrons, to directors and supervisors of vocational agriculture, and to the staff of the Department of Agricultural Education of Oklahoma State University, as well as to the teachers of vocational agriculture themselves. Hence, it was recognized that any study directed toward an evaluation of departmental accomplishments would furnish information of value for developing and revising courses of study and in planning long-time programs of vocational agriculture for local communities.

STATEMENT OF THE PROBLEM

The question first arises as to what are the major farming problems of the local community. Such a question cannot be separated from the relevant questions as to indentification and clarification of major problems of the school, the vocational agriculture department and the local teacher of vocational agriculture in developing and maintaining an

effective educational program in agriculture. To what extent is it feasible that a program of this nature be developed in the school? Are the major problem areas chosen so as to make up an educational program worthy of the time, effort and money spent in its development and maintenance? How effective will the methods used and learning activities planned be?

While within the scope of this study it is hardly feasible to attempt to investigate all of the factors that may be presumed to contribute to all phases of the educational program planned for a local department of vocational agriculture, an attempt has been made to investigate the significant factors and certain selected characteristics that exist in one phase of this program, the development of an effective program of soil conservation and management for farmers of the community.

PURPOSES OF THE STUDY

The purposes of this study were:

(1) To determine whether or not the educational program including learning activities of both high school students and adults was effective in increasing the number of selected soil conservation practices carried out on farms of the participants.

(2) To determine the relative effectiveness of a planned, concentrated educational program carried out through local schools both in all day and adult educational programs in vocational agriculture.

(3) To determine the extent to which time spent by the teachers in developing, implementing and maintaining an extensive all day and adult educational program in soil and moisture conservation and management can be justified in terms of results which may be achieved.

(4) To determine the feasibility of vocational agriculture depart-

ments and teachers of vocational agriculture stimulating interest in conservation of soil and moisture through an educational program to the extent that a significant increase in conservation practices may be observed.

DEFINITION OF TERMS

Participating groups. For the purpose of the study the term participating group specified those individuals, or farms of those individuals, that have had one or more boys in all day vocational agriculture classes and have participated in an educational program for all day and/or adults offered by the vocational agriculture department of the Marland Public Schools.

Non-Participating group. For the purpose of the study the term non-participating group specified those individuals, or farms of those individuals that had not had a boy in all day vocational agriculture classes nor had they participated in an educational program for all day or adults offered by the vocational agriculture department of the Marland Public Schools.

Group One and Group Two. To facilitate the construction of tables and compilation of data pertinent to the study those individuals or farms that were in the participating group was designated as Group One. Likewise that group of individuals or farms that were in the non-participating group was designated as Group Two.

LIMITATIONS OF THE STUDY

The scope of the problem was limited to one community and the activities of a single vocational agriculture department, namely Marland

School District 1-5 in Northern Noble County and to the Marland High School Department of Vocational Agriculture.

The study of conservation measures applied on the farms for the years 1956, 1957, and 1958 was limited to the home farms of students of vocational agriculture, the number of farms being 20 in 1956, 16 in 1957 and 16 in 1958, while data for the year 1959 included not only the farms of students of vocational agriculture numbering 18, but also 18 farms selected at random to serve as a check group for purposes of comparison.

METHODS OF PROCEDURE

Information on the physical factors of the Marland community were determined from a study of 75 farms and farmers in the area. This was a random sample taken from the alphabetical list secured from the Agricultural Conservation Program office in Perry, county seat of Noble County. This together with a survey taken by the United States Department of Agriculture constituted bases for comparisons of the Marland Community with any other community desired as to their physical comparison.

The soil conservation measures applied on the home farms of all day students have been collected and tabulated for the past 4 years by a point system developed by the Soil Conservation Service and designed to give, as near as possible, equal weight to various conservation measures which might be applied on a farm.

To further determine if this information on conservation measures applied could be possibly attributed to the educational program as carried out for all day and adult students in the Marland Community, a random sample of the farmers not associated with the program, that did

not or now have or who had never had a boy enrolled in vocational agriculture, were secured. They were selected at random from the alphabetical list that provided the information on the physical factors of the community. These people were then asked to fill out the same score sheet used by all day boys in securing the information on conservation measures applied on their home farms. These sheets were then tabulated on the point system and used as a comparison study with the total scores of the farms of all day boys in 1959.

This procedure then provides a year to year study and comparison of home farms of students for the 4-year period of 1956 through 1959 and a check of those participating and those non-participants in 1959 after years of an extensive educational program.

SCORING INSTRUMENTS USED

In order to arrive at comparative scores for participating experiences in applying conservation measures on the land, the author used the score sheet developed for use in the Soil Conservation Contest by the Soil Conservation Service for determining total points for practices applied on the farms giving equal weight to all conservation practices applied.

SOIL CONSERVATION PRACTICES SCORE SHEET[1]

This score sheet was used in determining total points for practices shown in tables listing conservation practices on the farms in the Marland Community.

Legumes planted in rotation or as cover crop

Alfalfa

[1]Soil and Water Conservation Association Districts of Oklahoma; Soil Conservation Program for Oklahoma F.F.A. Chapters, 1959-1960.

Sweet Clover	
Vetch	
Lespedeza	- 1 point each 3 acres
Guar	
Cowpeas	
Austrian Winter Peas	
Farming Practices	
Contour Farming	- 1 point each 17 acres
Stubble Mulching	- 1 point each 50 acres
Crop Residue Management	- 1 point each 50 acres
Strip Cropping	- 1 point each 6 acres
Mechanical Practices	
Terraces	-12 points each 1 mile
Grassed Waterways	-20 points each 1 waterway
Diversion Terraces	-26 points each 1 mile
Drainage	- 2 points each 3 acres
Farm Ponds	-16 points each pond
Pasture Practices	
Planting Native Grass	- 1 point each 2 acres
Planting Tame Pastures	- 1 point each 2 acres
Sprigging or Sodding Bermuda	- 1 point each 2 acres
Proper Use of Native Pastures	- 1 point each 25 acres
Brush Control	- 1 point each 10 acres
Wildlife Conservation	
Fish Pond Management	- 3 points each pond
Wildlife Habitat	- 1 point each 25 acres

CHAPTER II

REVIEW OF LITERATURE

Comparative studies of the nature presented in this writing were not discovered by the writer. Most studies having similar characteristics were found to be in developing a program of this type in public school systems, "The Agronomic Phase of the Teaching Program for Vocational Agriculture in the LaBette County Community High School."[2]

The "Development and Evaluation of an Adult Farmer Educational Program in the Tryon, Oklahoma Community"[3] followed the similar pattern except that it was concerned with the development of the program.

The value of this study was emphasised by Governor Brooks of Nebraska quote, "The day before I had talked to the Nebraska State Soil and Water Conservation Association. Their problem, as stated by themselves, is that of educating the Nebraska farmer on how to preserve our two most precious life giving elements - soil and water."[4]

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[2]Unpublished masters report, Oklahoma State University.

[3]Unpublished masters report, Oklahoma State University. Supplement number 12, Summary 2504

[4]Governor Ralph G. Brooks, "The Journal Salutes Nebraska" American Vocational Journal, December 1959

A review of literature of the characteristics of the area that are of importance is found in the Soil Surveys of Noble County.

GENERAL NATURE OF THE COMMUNITY

Location and Extent

The Marland Community is located in the north-eastern part of Noble County which is located in north-central Oklahoma. It is separated from Kansas by Kay County, Oklahoma. Perry, the county seat, is about 55 miles northeast of Oklahoma City, 75 miles west of Tulsa, and 35 miles southeast of Enid. The county is roughly rectangular and has an area of 747 square miles, or 478,080 acres. The community is at the eastern end of the main wheat-producing section of the State and on the southern edge of the tall-grass prairies of the central United States.

Climate[5]

The Marland Community has a continental, warm-temperate, sub-humid climate. Summers are decidely warm and winters are fairly mild and open. The climate is healthful, as it is neither excessively wet or dry. Cooling breezes moderate the high summer temperatures. Bright sunshine makes the winter temperatures seem less severe. Breezes or winds, blowing almost constantly through the year, are objectionable to people from the Southern and Eastern States, but welcome to all in midsummer.

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[5]Soil Survey, Noble County Oklahoma, series 1941, No. 16 Issued September 1956. United States Department of Agriculture, Soil Conservation Service, with cooperation with the Oklahoma Agricultural Experiment Station.

The average annual temperature is 60° F.; and the average annual precipitation, 34.24 inches.[6] Thornthwait's PE index is 58, which is within the range called subhumid in his classification of climate.[7]

The month of greatest rainfall are those in which crops are growing, April through September. Figures for a long period indicate a fairly even distribution of rainfall during the growing season. Nevertheless, dry spells lasting 4 to 6 weeks are fairly common. These dry spells do not cause crop failure but they curtail yields. Corn, which matures during the hot part of the summer, is most frequently damaged.

The soils are driest last of July and in August. High Temperatures, high transpiration of moisture by plants, and drying winds, remove moisture rapidly. The dry spells are most damaging on the extensive soils that have a subsoil of heavy clay. Part of the crop damage results from shrinking of the clay on drying. The cracks speed the rate of soil drying and also rupture plants roots. Drought damage is less on the more friable soils that have a sandy clay or sandy loam subsoil. The soils on the stream terraces and bottom lands show less damage from drought than those on the uplands, because they lose less water as runoff and many of them receive additional water from the upland.

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[6]Weather Station Records, Perry, Oklahoma.

[7]Blumenstock, David I., and Thornthwait, C. W. Climate and the World Pattern. In Climate and Man, U.S. Dept. Agr. Yearbook, 1941 pp. 98-127.

Late spring, summer, and early fall rains often come as hard showers. Winter rains are fairly gentle and steady. Wet spells are rare but occasionally delay harvest, or may prevent harvesting of small grains on the soils that have slow drainage. The wet spells also favor the spread and development of leaf and stem rusts of wheat which sometimes greatly reduce yields. Severe hailstones occur somewhere in the county nearly every year. The chance of a crop being hailed out is about one in ten.

The climate tends to hinder severe infestations of insects. Hot summers and low winter temperatures help control the boll weevil, the principal enemy of cotton. Dry periods during the growing period tend to check the hessian fly, a serious pest of wheat. Hard showers in May help control the chich bug, which is probably the pest that most frequently damages crops. The chinch bug spends the winter on small grains and crawls to corn and sorghums in summer. Hard showers drown the insect in the crawling stage. Hard showers also drown the greenbug, which sometimes seriously damages small grains. Wet weather in summer favors the chinch bug. The armyworm is more numerous when a wet seasons follows one or two dry seasons.

The frost-free growing season is 206 days, or from April 8 to October 31. Late frosts often destroy or seriously injure fruit crops. Early and late frost are more likely in valleys, where air drainage is deficient. Fruit trees on north slopes are less injured by frost because they bloom later. The latest frost recorded came on May 10, and the earliest in fall on September 26. The growing season is long enough to mature cotton, but little of that crop is grown. Winter wheat is far the most important crop, because it matures before the hot, dry

weather of midsummer. Moreover, much of the community consists of soils with a heavy clay subsoil that are better suited to wheat than row crops.

The prevailing winds are from the south. The average three o'clock wind velocity for the year is 14 miles per hour. Occasionally, violent spring and summer storms are experienced. Shifts in the wind during winter cause wide variations in temperature. "Northers" lasting three or four days come in winter. They bring rapid drops in temperature, which are moderated when the southerly winds return. Farm work can be done every month of the year, though little is done during the northers and the hot spells in summer.

The average relative humidity at 2:00 p.m. is 60 percent in January, 40 percent in April, 48 percent in July, and 50 percent in October. The sun shines 59 percent in summer, and 70 percent in fall.

In summary, the climate of the Marland Community favors a stable type of agriculture largely based on the production of winter wheat, oats, corn and livestock. Yields fluctuate widely because of intermittent dry spells. The farmer needs to keep surplus money or products on hand to tide him over the dry years. The rainfall is not great and, as a result, the soils are not strongly leached and do not need heavy applications of fertilizer for crop production.

GENERAL NATURE OF THE SOILS[5]

The soils of the Marland Community are mainly of the Reddish Prairie great soil group. Most of them have developed under grass. The normal soils in smooth areas have fairly dark surface soils that are slightly to moderately acid and dominantly of medium texture.

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[5]Ibid.

The normal soils, for the most part, have alkaline compact, very slowly permeable, clay subsoils.

As a whole, the soils are fairly productive, though their fertility has been depleted by erosion and constant cropping. About 10 percent of the agricultural land in the county consists of soils that can be used for crops without safeguards against erosion. About 40 percent is suitable for cultivation if intensive conservation methods and related good soil management are practiced. An additional 32 percent can be cropped but required contour cultivation of intertilled crops, use of the soils most of the time for erosion resistant crops, and other rather intensive measures for control of erosion. Except for small areas of forested sandy upland, some of which can be used for farm woodlots, the remaining 18 percent of the agricultural soils is best suited to permanent pasture or meadow.

MANAGEMENT OF MARLAND COMMUNITY SOILS[8]

Management of the cultivated land in the Marland Community must take into account the fact that the natural fertility of the soils has been the principal source of plant nutrients for growing crops during the past 50 years.

In some cultivated fields, continuous growing of wheat and other soil-depleting crops had reduced the supply of organic matter in the soils, and erosion has removed much, or all, of the surface soil from the steeper slopes. Erosion and declining fertility are problems that need to be met by improved management.

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[8]Horace J. Harper, Oklahoma Agricultural Experiment Station; Soil Survey, Noble County Oklahoma, series 1941, No. 16 issued Sept. 1956.

Recent rapid increase in use of fertilizer is evidence of the fact that farmers in the community are aware of the decline in soil fertility.

EROSION - If erodible soils are used for cultivated crops, efforts to improve them are often wasted unless a combination of engineering practices and cropping methods are used that will protect the soils. In this community a considerable acreage of moderately to steeply sloping land not protected by vegetation has been severely sheet and gully eroded. Also, in large gently sloping fields, runoff may concentrate to such extent that areas not protected by vegetation will be damaged.

A limited acreage of steeply sloping land used for cultivated crops should be planted to native grasses that would control erosion. Nevertheless, many eroded soils that do not contain too much clay will produce profitable yields of wheat, provided the crop is grown in a short rotation that includes sweetclover and the soil receives tillage and mechanical treatment that prevents further damage from runoff.

Wheat, the principal crop in this community, is fairly effective in controlling erosion because it covers the ground a large part of the year. The numerous areas of eroded wheatland in the community, however, are evidence that wheat alone cannot be relied upon to control erosion. Rotation of wheat and other small grains with legumes, proper fertilization, correct tillage methods, plus terracing or other engineering methods, where needed, will give effective control of erosion. The management that increases and maintains crop yields is the management that does most to control erosion. Terracing or other engineering devices used alone are not effective.

CROP ROTATION - Rotation of legumes with wheat and other small grains is effective for increasing yields and checking erosion. Few

farmers in the community practice crop rotation, though almost all the soils will produce a fair crop of some type of legume. Experimental results indicate that yields of small grains can be increased 30 to 50 percent on many of the soils merely by growing them in rotation with a legume and adding lime. Many of the soils are too acid for growth of legumes; lime must be added to such soils before legumes will grow a stand that will protect the soils and provide the organic matter and nitrogen that will increase soil productivity.

Alfalfa is the best legume to use to increase the amount of available nitrogen and active organic matter in many upland soils and in those bottom-land soils not frequently overflowed or poorly drained. On large acreages, biennial sweetclover can be used more effectively than alfalfa. The sweetclover is planted in a crop of barley or spring oats and provides grazing or seed the second year.

TILLAGE METHODS - When the moldboard plow is used, plowpans develop in some medium-textured soils used for wheat and other crops. A plowpan is a layer of slight clay accumulation or cementation just under the furrow slice. It retards downward movement of water and plant roots. Legumes should be rotated with wheat and other small grains to help break up this plowpan. If a tap-rooted legume such as sweetclover or alfalfa is planted on soils that have a plowpan at a depth of 7 to 10 inches, the roots usually penetrate the plowpan in enough places to permit satisfactory movement of water, air, and plant roots into the subsoil.

Tractor-farming has speeded up the process of soil depletion by stirring and mixing the surface layers to greater depths. This kind of farming need not be harmful. It will not be if the physical structure

of the soils is preserved by adding organic matter. Then, when the native fertility of the soil will not longer produce crops satisfactorily, plant nutrients can be added in commercial fertilizers.

PASTURE MANAGEMENT - Virgin prairie of tall grasses originally covered most of the pastureland. Much of this pastureland occurs in the eastern section of the community. The topography is more rolling there, and many shallow soils occur on moderately to steeply sloping land. The surface layer of some of this pastureland has more clay than much of cultivated land. The principal problem in pasture management is to increase the use of grazing practices that will maintain or improve the growth of native grasses. Perennial weeds, where abundant, can be controlled by spraying with 2,4-D or other effective weedkillers.

The stocking rate in the area is considered 8 acres per cow but with proper management and improvement could be increased.

EDUCATIONAL ACTIVITIES IN SOIL MANAGEMENT AS PROVIDED THROUGH THE PROGRAM OF VOCATIONAL AGRICULTURE

The educational program in vocational agriculture in the Marland High School is designed to meet the needs of community residents of all ages. Many of the learning activities are designed so as to be family oriented. For example, meetings of the Mother's Club of the Future Farmers of America have often developed into study groups involving not only both parents, but other members of the family as well. Evening meetings planned for adult farmers will include presentations by high school students, both as individuals and as teams or class groups. The entire family often is in attendance and are proud to see older

brother demonstrating his knowledge and skills to the community group.

Topics for discussion at adult farmer meetings during the years of 1956 through 1959 included many phases of soil and wildlife conservation. The major topics were: soil types and profiles, wind and water erosion control, terrace systems and construction, waterways, contour farming, cover crops and soil conserving crops, grass and legume planting, selection and indentification of useful legumes and grasses and wildlife conservation.

These same topics were used in instruction of all day boys in vocational agriculture, however, treatment of all topics was much more extensive for the high school students. For example, in terracing, the all day boys were taught how to operate the farm level for running terrace lines in addition to its many other uses such as graded lines, contour lines and water lines. In actual laboratory periods high school students became proficient in various phases of terracing and use of the farm level.

The major methods of instruction employed with the all day classes included group discussion, laboratory exercises, films, film strips, field trips and work with demostration plots while with the adult meetings many resource people were used from the Soil Conservation Service, Extension Service, and neighboring vocational agriculture departments as well as films, slides, charts, samples, posters, tours and field trips, and group discussion.

The supervised farm training of the high school students in vocational agriculture included many learning activities in soil and moisture conservation in connection with improvement projects and supplementary job skills.

There were 316 improvement projects completed in soil conservation, wheat, small grain and crop improvement, pasture improvement, wildlife conservation, terracing and maintenance, mechanical soil conservation, water way construction and maintenance, and fertilizer applied on a total of 16,245 acres, 121½ miles of terraces, 10 waterways, and 34 projects in wildlife conservation including stocking ponds with fish, posting hunting signs and providing feed and cover for wildlife.

Many supplementary skills were performed in the educational program of the all day boys including running a level line, contour line, water line on ponds to locate the spillway; grass judging and identification and land and pasture judging. A total of 624 supplementary projects were completed by high school students during the four years.

The conservation program carried on by the adults on their home farms is presented as a major portion of the findings of the study.

The investigator as teacher of vocational agriculture feels that the fact that students were involved as participator with adults in not only gaining knowledge, but also appreciations and skills contributed greatly to the strength of the educational program.

Figure 1. Farmers and wives were interested participators in a study of native pasture grasses. Pasture improvement was evident on many farms of the community.

Figure 2. A Bermuda grass waterway two months after planting on the farm of Warren Case, five miles west of Marland, Oklahoma. It is sixty-five feet wide and 26,000 feet long and designed to remove terrace water from approximately eighty acres of cropland. On this farm is found seven grassed waterways and a total of 13 miles of terraces. The entire family was active in the educational program, father, mother, and Future Farmer son Jerry and his sister Peggy.

Figure 3. Future Farmer Dennis Olbert explains how to identify a species of grass and evaluates its use in an improved pasture program. Educational meetings in the Marland Community find the entire family in attendance as participants.

Figure 4. Family groups study together in the outdoor laboratory. Here the teacher of Vocational Agriculture directs an examination of demonstration plots of Midland and Greenfield Bermuda grasses.

CHAPTER III

PRESENTATION AND ANALYSIS OF DATA

The educational program of soil conservation that has been implemented and maintained in the Marland community by the vocational agriculture department was started when the department was organized and chartered in the summer of 1954. It was provided a strong incentive for strengthening both the nature and scope of activity by the inception of the State Soil Conservation Contest during the 1955-56 school year.

Reports of activities in various phases of the State Contest was first compiled and submitted for consideration in June, 1956. Since that time the material has been periodically compiled each year in June and submitted for the judges' consideration of outstanding conservation achievements. During this time the Marland F.F.A. has been three times an Area winner and once the State Champion as well as four times District winner.

In other portions of this contest the Marland F.F.A. has contributed the State Future Farmers of America - Soil Conservation District speech winner 1958. The local chapter also achieved first place for State scrapbook in 1957 and 1959, third in 1956, and second in 1958. The written chapter report of accomplishments in soil conservation was selected as first place winner in 1958, second in 1957, and third in 1956.

Though this investigation is not to be construed primarily as a study of contests, this information on the State Soil Conservation Contest activities has been presented as data to show that the Marland community does have a well established educational program in soil conservation through an active F.F.A. chapter and is recognized as one of the superior chapters of the state in terms of accomplishments in that area.

Data as presented in Table I was compiled and presented as a summary of the educational program in soil conservation and management that has been carried on in the Marland community for both all day and adult students of agriculture during the four year period covered in this study.

Each of these activities listed are believed to have been of educational value to both adult and all day students and to have contributed to the ultimate goal of increasing the conservation practices applied on the land in the Marland community.

The second year, 1957, was the largest program and resulted in the state championship for the Marland F.F.A. Chapter. Also due to the educational program carried on in 1957, the author was awarded the first place award as the outstanding vo-ag teacher in Oklahoma in conservation education in 1957. This award was made by the Soil Conservation Society of America.

Since that time the educational program has been carried on a slightly smaller scale yet it remained of sufficient magnitude to have undoubtedly had considerable bearing on the educational opportunities available to the community.

TABLE I

CONSERVATION ACTIVITIES SPONSORED IN THE MARLAND COMMUNITY DURING THE FOUR YEAR PERIODS

	Activity	1956	1957	1958	1959
A.	Number conservation films shown	20	46	41	19
	Times shown	27	77	66	36
	FFA members viewers	231	544	482	387
	Adult viewers	829	1493	604	436
B.	Number neighborhood of community meetings	21	39	32	24
	Attendance (cumulative)	823	1953	1497	1526
C.	Number of Tours in area	5	8	7	4
	Attendance	186	252	172	147
D.	Number of Local contest sponsored in community	16	30	37	20
	Number of participants	246	506	570	477
E.	Number of displays, exhibits & demonstrations	77	96	138	142
F.	Number of T.V. shows of local nature & interest	0	1	2	3
G.	Number of Radio shows of local nature & interest	0	1	2	1
H.	Number of speeches given by FFA members before organized groups	15	16	19	14

The author is willing to recognize that there was probably a very strong motivating force toward increased interest in conservation as a result of the element of contest achievement involved in this program. However, regardless of the motivating force or forces or purpose behind the concentrated effort to promote the educational features of this program, the author feels this had little or no direct bearing on the

actual application of soil conserving practices on the land.

The strength in which the parents came to believe in soil conservation may or may not have a bearing on their participation, or their childrens' participation in a land judging contest, speech event or even their attendance at a local neighborhood meeting to see a soil conservation film, listen to a talk on soil conservation, or participate in the group discussion of conservation problems. However, this can be recognized as causing them very little if any expense or inconvenience. It seems extremely doubtful that you could persuade a farmer to build a pond, terrace, grass waterways or plant part of his productive farmland in a legume just for the sake of benefiting your program in a contest.

Those of us acquainted with the cost of applying these practices coupled with the inconvenience of farming terraced lands on the contour, as well as the possibility of pasturing just a few more head of cattle thereby making a few more dollars at the present time, know the truth of the following statement: Conservation must be in the hearts and minds of men before it can be applied to land.

The contest participation did arouse interest in conservation and through the various activities with the end result that people began to think in terms of conservation accomplishment, but the reason for action was due to a pride in their own ability to have a well conserved farm.

GENERAL CHARACTERISTICS OF THE SOIL OF THE MARLAND COMMUNITY

In Chapter II reference was made to the soil survey of Noble County by the United States Department of Agriculture. In 1959 a survey of 75 farmers in the Marland Community was made by the vocational agriculture

department to ascertain some of the significant factors of general nature of the community. In relationship to the soils of the community the factors were (1) types of land, (2) type of soil, and (3) depth of soil.

Table II bears out the information of the soil survey of the area that most of the land in farms is of upland type with a rather small percentage of bottom land.

Data further reveals no irrigated farms in this area. However, from the personal knowledge of the author three small sprinkler types of irrigation does exist in the area however the total acreage would only be around twenty or thirty acres in bottom land areas along the Arkansas River and would be of very little significance to this study.

TABLE II

TYPES OF LAND IN THE MARLAND COMMUNITY

Type of land	Farms having: Number	Percent
Upland	61	81 1/3
Bottom	14	18 2/3
Irrigated	0	0
Total	75	100 %

Data presented in Table III clearly show the most prevailing type of soil in the area to be of a loamy nature. A small percentage of the land is sandy in nature while an even smaller percent is of a clay type. This data coincides with information of the soil survey as previously cited in the study.

Fifty seven of the farms, which is seventy six percent, are predominately loam soil while fifteen, or twenty percent of the farms have predominately sandy soils.

TABLE III

TYPES OF SOIL IN THE MARLAND COMMUNITY

Type of Soil	Farms having: Number	Percent
Sandy	15	20
Loam	57	76
Clay	3	4
Total	75	100 %

The majority of soils are found to be medium in depth. Twenty-five percent of the soils are classes as deep soils. However, a further breakdown of the deep soil shows that fifteen to twenty percent of the farms that were either loam or clay were classed as deep soils.

Sandy soils are generally found along the Salt Fork River, which bounds our community to the north and the Arkansas River which bounds our community on the east.

Only two and two-thirds percent of the farms indicated shallow soils while 54 farms or seventy-two percent indicated soils of the medium depth class.

TABLE IV

DEPTH OF SOIL IN THE MARLAND COMMUNITY

Depth of Soil	Farms having: Number	Percent
Deep (Sandy)	15	20
Deep	4	5 1/3
Medium	54	72
Shallow	2	2 2/3
Total	75	100

GENERAL CHARACTERISTICS OF THE FARMERS OF THE MARLAND COMMUNITY

In order to form a basis for comparison of groups of residents in the community and area, and to have an understanding of the general characteristics of the farmers in the Marland Community a survey of seventy-five farmers in the Marland Community was made by the vocational agriculture department in 1959.

The significant factors which were surveyed included (1) capital investment of farmers, (2) tenure of farm operators, (3) age of farm operator, (4) education of farm operators.

The following table indicates the largest number of farmers in the area, fifty-two percent, have an investment of between $10,000 and $50,000 in their farm operations. A large percentage of the farmers, forty-one and one-third percent, were found to have a total of over $50,000 invested in farming operations. Only six and two-thirds percent of the farmers show an investment of less than $10,000 in their farming operations.

TABLE V

THE CAPITAL INVESTMENT OF FARMERS IN THE MARLAND COMMUNITY

Capital Investment	Farms reporting: Number	Percent
Under $10,000	5	6 2/3
$10,000 to $50,000	39	52
Over $50,000	31	41 1/3
Total	75	100

Data presented in Table VI shows the largest percentage of the farm operators to be both renters and owners. The next largest group of farmers are farm owners.

Only sixteen percent of the farm operators are renters only, which indicates eighty-four percent of the farm operators in the area are owners of some land in the community which would tend to indicate the tenure in the community is rather stable and not likely to change to any great extent from year to year as if most of the farmers were renters and rely on leases from year to year.

The largest group of operators in the community fall into the age group between thirty-one and forty-five. The second largest segment comprises the group with ages between forty-six and sixty, while twenty-two percent of the farm operators are sixty-one or over. The relatively large group with ages sixty-one or over would indicate that there may soon be room for younger operators in future years. Only four percent of the farm operators surveyed were under thirty years of age. An interesting observation or sidelight of this information is that two of the three farmers under thirty are former vocational agriculture

students and Junior Master Farmers. Perhaps we could assume that two-thirds of the farmers under thirty are Junior Master Farmers. The author does know that the survey covers over fifty percent of farm operators in the community and that there are two other Junior Masters under thirty farming in this area.

TABLE VI

TENURE OF FARM OPERATORS OF THE MARLAND COMMUNITY

	Farmers reporting	
Type of Operator	Number	Percent
Owner	27	36
Renter	12	16
Both	36	48
Total	75	100

TABLE VII

AGE OF FARM OPERATORS IN THE MARLAND COMMUNITY

	Farmers indicating:	
Age of Operator	Number	Percent
Under 30	3	4
31 - 45	29	38 2/3
46 - 60	26	34 2/3
61 or over	17	22 2/3
Total	75	100

Regarding education completed, the largest group of farm operators fall into the group with a formal education of between nine and twelve years, however, this group comprises only slightly over fifty percent while thirty-six percent of the farm operators have only eight years or less in formal education. Only eight percent of the farm operators have any formal education above the high school level with only two and two-thirds percent of them being college graduates.

TABLE VIII

EDUCATION OF FARM OPERATORS IN THE MARLAND COMMUNITY

	Farmers indicating:	
Education of Operator	Number	Percent
8 years or less	27	36
9 - 12 years	42	56
Some college	4	5 1/3
College graduate	2	2 2/3
Total	75	100

CONSERVATION MEASURES ON FARMS OF PARTICIPATING STUDENTS AS APPLIED OVER A FOUR-YEAR PERIOD

Conservation measures applied on the home farms of adults and all day students who were participants in the soil conservation educational program of the Marland vocational agriculture department have been calculated each year 1956 through 1959. The information gathered forms the basis for a comparative study of the total conservation programs accomplished over this four-year period. This further serves as a basis for comparing the nature and extent of measures actually applied

on farms. The information has been compiled in the following major fields of conservation: (1) Wildlife conservation, (2) Legumes used in rotation, (3) Mechanical practices, (4) Farming practices, (5) Pasture practices.

Wildlife conservation practices are recognized as important to conservation in general. Data shown in Table IX indicate a rise in total wildlife conservation measures applied from year to year from 1956 through 1959.

TABLE IX

WILDLIFE CONSERVATION MEASURES APPLIED

Practice	Total application in terms of points for years: 1956	1957	1958	1959
Fish Pond Management	18	105	135	93
Wildlife Habitat	2	2	268	444
Total Points	20	107	403	537

The table indicates a small reduction in fish pond management in 1959 as compared with 1958. There has been a large increase in wildlife habitat in both 1958 and 1959 on the farms of participating students.

The increase in 1957 was five times larger than 1956 which is a large increase; however, the largest total increase came in 1958 which was four times larger than 1957.

The use of legumes has been growing slightly over the four-year period except for the high figure of 169 points for sweet clover in 1957. This is due to one large planting on one farm.

The significant factor appears to be that there is a growing planting of legumes for soil improvement regardless of weather conditions and other factors affecting planting of a particular legume from year to year yet a study increase in total legumes grown.

Guar was first used in this area in 1956. One could also assume Guar was not too well received in this area.

TABLE X

CONSERVATION PRACTICES APPLIED LEGUMES PLANTED IN ROTATION OR AS A COVER CROP

LEGUMES	Total application in terms of points for years: 1956	1957	1958	1959
Alfalfa	80	70	112	81
Sweet Clover	63	169	50	45
Vetch	64	36	67	60
Lespedeza	3	9	2	58
Guar	23	3	3	
Cowpeas		10		
Winter peas	22	35	60	65
Total Points	255	332	294	309

The mechanical practices of soil conservation have also increased steadily over the four year period studied. Diversion terraces and drainage are generally not recognized as important practices for this area.

A significant factor would appear to be the increase in grassed waterways and miles of terraces placed on the land along with the

increase in construction of farm ponds. These ponds will check and hold water in detention and prevent runoff as well as provide adequate water for stock water and proper range distribution and management.

TABLE XI

CONSERVATION PRACTICES APPLIED AS MECHANICAL PRACTICES

Type	Total application in terms of points for years: 1956	1957	1958	1959
Terraces	534	663	1344	1878
Grassed waterways	460	580	740	980
Diversion terraces		26	45	22
Drainage	7	123	0	277
Farm Ponds	688	976	1104	1616
Total Points	1689	2368	3233	4773

Findings as shown in Table XII would indicate strip cropping was of little or no importance to this area except perhaps on some small sandy areas.

The significnat factor appears to be the steady rise of the application of such farming practices as contour farming which are tied closely with the mechanical practices of terraces shown in table XI. The combination of practices will no doubt provide sound soil conservation and management on the farms in the Marland Community.

The proper management and use of pastures is very important in the conservation program of any community and in many areas is as important as is proper management of cropland in the community.

It would appear significant that there has been a steady rise in proper use of native pasture as well as planting of native, tame and bermuda grasses for improved pastures on the farms in the Marland Area.

TABLE XII

CONSERVATION PRACTICES APPLIED AS FARMING PRACTICES

Practice	Total applications in terms of points for years: 1956	1957	1958	1959
Contour	190	164	181	235
Crop Residue	6	20	94	30
Stubble Mulching	10	82	26	73
Strip Cropping		20	13	0
Total Points	206	286	314	338

TABLE XIII

CONSERVATION PRACTICES APPLIED AS PASTURE PRACTICES

Type	Total applications in terms of points for years: 1956	1957	1958	1959
Proper use of Native Pasture	72	442	310	507
Planting Native Pasture	13	0	100	208
Planting tame Pasture	42	70	40	145
Planting Bermuda	4	18	32	141
Brush Control	6	1	72	143
Total Points	137	531	554	1144

CONSERVATION MEASURES APPLIED ON FARMS USED FOR COMPARISON

Conservation measures applied on the home farms of adults and all day students that participated in the soil conservation educational program of the Marland vocational agriculture department have been calculated on the point basis for the year of 1959. For the convience of tabulation farms of the participating group will be known as Group I.

The same information was secured and calculated for the year 1959 from an equal number of farms selected at random from a previously compiled list for the purpose of securing information on the general characteristics of the community. For the convenience of tabulation this group will be designated as Group II.

The data so gathered forms the basis of a comparative study of the conservation measures applied during 1959 showing the amount of conservation actually applied on farms of those farmers in both Group I and Group II. Such a presentation facilitates evaluation of the comparison of conservation (1) Wildlife conservation, (2) Legumes used in rotation, (3) Mechanical practices, (4) Farming practices, (5) Pasture practices.

The importance of wildlife conservation practices to conservation in general can hardly be over estimated. Findings as presented in Table XIV indicate more emphasis has been placed on wildlife conservation by those that have participated in the adult program or by those having boys in vocational agriculture classes than by those farmers who have not participated.

While it was determined that there was slightly more fish pond management accomplishments among those that were not participants as

compared to participants, the amount of wildlife habitat area established was almost all credited to members of the participating group. It seems quite plausible that decisions to establish wildlife habitat areas were at least partially influenced by a high degree of family interest and expressed desire. The fact that family groups participated in many phases of the instructional aprogram may well have accounted for the relatively high rate of adoption by participators.

TABLE XIV

WILDLIFE CONSERVATION CONSERVATION PRACTICES APPLIED ON FARMS IN THE MARLAND COMMUNITY

Practice	Total practices in terms of points	
	Group I	Group II
Fish pond management	93	111
Wildlife habitat area established	444	2
Total Points	537	113

A comparison of legume plantings for conservation purposes by the two groups clearly indicates those farmers that participated in the educational program or had sons in all-day agriculture classes used more acres of legumes in rotation and for cover crops in 1959 than those that did not participate or have not had a boy in vocational agriculture at any time since the vocational agriculture department was organized in 1954.

Data presented in Table XV also clearly shows that there was a greater variety of legumes used by those participating (5) as compared to non-participants (3) in their conservation program for cover crops and rotation practices.

TABLE XV

LEGUMES USED IN ROTATION ON FARMS IN THE MARLAND COMMUNITY DURING 1959

Legumes	Total practices in terms of points: Group I	Group II
Alfalfa	81	71
Sweet clover	45	0
Vetch	60	13
Lespedeza	58	0
Guar	0	0
Cowpeas	0	0
Winter peas	65	36
Total	309	120

When the groups of participators and non-participators were compared it was found that nearly twice the amount of mechanical structures were used in 1959 by those that were participators. The participation summary presented in Table XVI clearly shows the large difference in the amount of conservation practices applied between the groups with regard to usage of each type of mechanical structure for which data was obtained. In fact, the total usage of conservation structures recorded for the participating group was almost double that which occurred on the farms of non-participators.

The total amount of conservation measures applied by farming practices are clearly shown by summaries appearing in Table XVII to be greater for those that have participated in the educational program in some way when compared with the extent of applications on farms of non-participators.

TABLE XVI

MECHANICAL STRUCTURES FOR CONSERVATION USED ON FARMS IN THE MARLAND COMMUNITY IN 1959

Type of Structure	Total practices in terms of points: Group I	Group II
Terraces	1857	1044
Grassed waterways	980	620
Diversion terraces	22	0
Drainageways	277	64
Farm ponds	1616	672
Total points	4773	2400

TABLE XVII

CONSERVATION FARMING PRACTICES USED ON FARMS IN THE MARLAND COMMUNITY IN 1959

Practice	Total practices in terms of points: Group I	Group II
Contouring	235	115
Crop residue usage	30	44
Stubble mulching	73	17
Strip cropping	0	0
Total points	338	176

Only one practice, that of crop residue management shows a larger amount of application by non-participants. The use of this practice is largely confined to farms with soils of a lighter or sandier type.

The practice of strip cropping has very little application to farms of the area.

The large amount of difference in contour farming practices was probably related to the same extent of difference shown in Table XVI in terms of terrace systems used. It would appear that farmers with larger more extensive terrace systems properly maintained would also have more acreage using contour farming.

The greatest difference in conservation accomplishments between groups was found in the area of conservation pasture practices. As can be readily seen by examination of data in Table XVIII over ten times as much was accomplished in approved pasture management by participators as by non-participators.

The large amount of proper use of native pasture may find some reason in the mechanical practices table which shows a larger number of farm ponds in Group I than in Group II which could indicate why the native pastures are more properly used as well as the use of other pasture grasses.

The practices which were found to have been applied in the Marland Community two of the four years studied were considered major in importance to the community. A few minor practices largely those that appeared only one year were omitted from the summary. Therefore the totals for each year may not exactly coincide with the added total of the columns as they were listed elsewhere in the study, however, the difference is not a significant figure.

Data was summarized in Table XIX in order to give an overall picture of the conservation measures applied in the Marland Community and to facilitate comparison year by year of those individuals comprising

Groups I and II respectively. It is particularly noteworthy to observe the steady increase in conservation measures applied by farmers comprising Group I over the entire four-year period.

TABLE XVIII

CONSERVATION PASTURE PRACTICES USED ON FARMS OF THE MARLAND COMMUNITY IN 1959

Practice	Total practices in terms of points: Group I	Group II
Conservation of native pastures	507	87
Planting native pastures	208	0
Planting tame pastures	145	0
Planting Bermuda	141	18
Brush control	143	1
Total Points	1144	106

When the accomplishments of farmers in Group I made in 1956 are compared with the accomplishments of Group II for 1959 we can observe that the latter group has only achieved slightly more in 1959 than did Group I in 1956. It would seem therefore that although some progress is possibly being made by farmers in both groups those who are participators in educational activities provided through the vocational agriculture program are progressing at a much more rapid rate. At least there seems a definite indication that a positive association exists in the Marland Community between a more rapid rate of accomplishment in conservation and participation in educational activities provided by the vocational agricultural department of the Marland High School.

TABLE XIX

SUMMARY OF CONSERVATION MEASURES APPLIED ON FARMS IN THE MARLAND COMMUNITY

	Group I				Group II
Practice	1956	1957	1958	1959	1959
Wildlife conservation	20	107	403	537	113
Legumes in rotation	255	332	294	309	120
Mechanical practices	1689	2368	3233	4773	2400
Farming practices	206	286	314	338	176
Pasture practices	137	531	554	1144	106
Total points*	2312	3614	4804	7229	2915

*A few minor practices were not included in this summary.

CHAPTER IV

SUMMARY AND CONCLUSIONS

As was stated in the first chapter there were several purposes of this study. A central purpose was to determine whether or not the educational program in soil conservation did result in an increase in the conservation practices applied on farms of the community.

Secondarily, and depending largely upon the answer to the primary question, were other significant purposes, namely: (1) to determine the relative value of a concentrated educational program provided through local schools for both high school all day and adult students, (2) to develop information of value to workers in agricultural education from the standpoint of justifying time spent on extensive all-day and adult educational programs,(3) to determine to what extent a vocational agriculture department and teachers of vocational agriculture can stimulate sufficient interest in conservation through an educational program to increase conservation practices on the farms of the community and, (4) to determine the feasibility of developing the educational program in vocational agriculture from the standpoint of activities for the family.

The investigator feels that these purposes have been realized to a reasonable degree.

SUMMARY

The study will be summarized in two portions. First, data as regards the community, its resources and general characteristics, and

secondly with regard to results obtained in the form of conservation measures applied on the farms in the community.

An attempt was made to present the physical characteristics of the community in order that interested readers might make a comparison with their community with regard to the possibilities of carrying out a similar educational program in soil conservation.

The study shows the results of the educational program in applying the conservation practices to the land which should be the ultimate end goal in any educational program involving land and people.

The Marland farming community is principally upland, with a medium depth of soil of loam texture. The average capital investment in farming is over $10,000 with many farmers having over $50,000 invested. Only 16 percent of the operators of farms of the community are renters, with 36 percent owners and 48 percent both owners and operators, making 84 percent of the farm operators at least an owner of some or all of the land he operates. This high rate of ownership contributes to making tenure in the community rather stable. Most of the farm operators are over thirty-one years of age with 57 percent over forty-six years of age. The educational attainment of 92 percent of the farm operators is of high school level or less with only five percent having some college training. Thirty-six percent of the operators have eight years or less of formal education.

The second part of this summary is concerned with the nature and extent of conservation practices applied on farms in the community. It was assumed for this study that the farms studied constitute a representative sample of all people included in the study of the characteristics of farms of the community. The assumption was further based on the fact

that all boys enrolled in school have taken vocational agriculture and their home farms are included in this study. It is therefore established that the people and farms involved are not a select group but consist of an average group of people and farms in the community. The non-participating group constituted a random sample of the same group in the previous study of characteristics of the community with the exclusion of participators.

This study establishes the fact that there has been a steady increase in soil conservation practices applied on the farms of the community over the four-year period covered in this study. As computed on the point system developed by the Soil Conservation Service giving appropriate weight to each practice applied, the study indicates a total accomplishment as follows: 1956 - 2,312 points, 1957 - 3,614, 1958 - 4,804 points and 1959 - 7,229 points. A definite steady progress and advancement in the number of conservation practices applied on the farms is thus established.

As a check on these figures a random sample of farms and farmers that had not participated in the educational program or had not had a boy in vocational agriculture was chosen and the same questionnaire submitted to them for a recording of practices accomplished in 1959. The group of participating farmers were found to be accomplishing a significantly greater number of conservation practices in each major division of the study.

The non-participating farmers indicated a total amount of conservation measures applied in 1959 which was only slightly above the level of attainment reached by the participators at the beginning of 1956. It was particularly gratifying to observe the steady increase in conserva-

tion measures applied by farmers participating in an educational program over an entire four-year period.

CONCLUSIONS

From this information it is concluded that the Marland community was not necessarily considered an exceptional area. The farms and their operators are average for North Central Oklahoma with respect to the land description, tenure of operators, age of operators and education of operators. It is recognized that the capital investment of these operators may be slightly above the investment in some areas due to the varying cost of land in Oklahoma.

It is concluded from the second phase of this study that the educational program in soil conservation for both adult and all day boys definitely did have a positive influence on the steady continued rise in the amount of soil conservation practices applied on the farms of the community.

A significant factor which is of basic value in evaluating the program is that this program was developed in a community through a vocational agriculture department that was relatively young, having only been established in 1954.

It would therefore seem plausible to conclude from a consideration of the findings that a program of this or similar type can be and perhaps should be developed by many vocational agriculture departments in Oklahoma. Whether the solving of problems related to soil conservation and management was given major emphasis or attention to some other major problem area was considered, the results obtained might be expected to be somewhat similar. It should be understood that the type of educa-

tional program referred to here is one which would be planned in such a way as to provide a maximum of activities for both in-school and out-of-school participants. At least a portion of the activities should be so planned as to involve family interest and participation. Not only should parents be given an opportunity to feel a pride in the accomplishment of their children but the children need to feel a pride of accomplishment in the achievements of the family and community groups to which they belong.

As a final conclusion the investigator submits as a proven thesis the fact that a program of educational activities in vocational agriculture so planned as to place emphasis upon mutual interest and accomplishments of the family and its members has a strong possibility for success. He further feels that this has been amply demonstrated by the findings of this study.

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