Perceptions of 4-H members, leaders and county agents toward the Montana 4-H vegetable gardening projects
by Susan Lynn McMaster

A thesis submitted in partial fulfillment of the requirements for the degree of Master of Science in Agricultural Education
Montana State University

Abstract:
This study determined the perceptions of 4-H members, leaders and county agents toward the Montana 4-H vegetable gardening projects. Data for the study was gathered through the use of mailed questionnaires sent to a population of 35 county agents, 60 4-H leaders and 145 4-H members. Information from the returned questionnaires was coded, entered into the CP6 Honeywell Computer and statistically analyzed with the use of the Statistical Package for the Social Sciences.

Based on the results of the study, it was concluded that skills that could be acquired through participation in a 4-H vegetable gardening project were important, use of specific vegetable gardening bulletins was low, the bulletins that had been used by the respondents were rated as being very helpful or helpful, participation in certain 4-H activities was low and goals established at the state and national level were accomplished by 4-H members. Acquiring the knowledge and developing the skills needed to care for and manage a well planned vegetable garden project were strengths of the gardening projects and too little emphasis on the basics of vegetable gardening were weaknesses of the Montana vegetable gardening projects.

Recommendations for improvement of the gardening projects included: detailed project manuals should be developed, 4-H members, leaders and county agents need to be made more aware of the vegetable gardening bulletins available and 4-H members need to become aware of the experiences in gardening projects and related activities: demonstrations, judging, tours and exhibits.

PERCEPTIONS OF 4-H MEMBERS, LEADERS AND COUNTY AGENTS TOWARD THE MONTANA 4-H VEGETABLE GARDENING PROJECTS

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A thesis submitted in partial fulfillment
of the requirements for the degree

of

Master of Science

in

Agricultural Education

MONTANA STATE UNIVERSITY
Bozeman, Montana
May 1985

APPROVAL

of a thesis submitted by

Susan Lynn McMaster

This thesis has been read by each member of the thesis committee and has been found to be satisfactory regarding content, English usage, format, citations, bibliographic style, and consistency, and is ready for submission to the College of Graduate Studies.

5/16/85
Date

C. Van Shelhamer
Chairman, Graduate Committee

Approval for the Major Department

5-16-85
Date

Mat S. Anderson
Head, Major Department

Approved for the College of Graduate Studies

5/17/85
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ACKNOWLEDGEMENTS

The author thanks all who helped to make this study possible. A special thanks is extended to the author's major advisor, Dr. Van Shelhamer, for his input and advice throughout the course of the study. A sincere thanks to Jim Sargent and Dr. Max Amberson, members of the author's graduate committee, for their suggestions and aid. The author extends thanks to the Cooperative Extension Service and the Department of Agriculture and Industrial Education for providing the resources needed to complete this study. Appreciation is extended to Dr. Al Suvak and Georgia Ziemba for their assistance with computer services and to Dr. Eric Strohmeyer and Dr. Doug Bishop for their statistical advice and aid in formulating questionnaires. Gratitude is extended to Bob Neely for his computer assistance, and to Jeanne Kenczka for her secretarial assistance. The author wishes to express a special note of thanks to all of the county agents, 4-H leaders and 4-H members who participated in this study.

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ABSTRACT

This study determined the perceptions of 4-H members, leaders and county agents toward the Montana 4-H vegetable gardening projects. Data for the study was gathered through the use of mailed questionnaires sent to a population of 35 county agents, 60 4-H leaders and 145 4-H members. Information from the returned questionnaires was coded, entered into the CP6 Honeywell Computer and statistically analyzed with the use of the Statistical Package for the Social Sciences.

Based on the results of the study, it was concluded that skills that could be acquired through participation in a 4-H vegetable gardening project were important, use of specific vegetable gardening bulletins was low, the bulletins that had been used by the respondents were rated as being very helpful or helpful, participation in certain 4-H activities was low and goals established at the state and national level were accomplished by 4-H members. Acquiring the knowledge and developing the skills needed to care for and manage a well planned vegetable garden project were strengths of the gardening projects and too little emphasis on the basics of vegetable gardening were weaknesses of the Montana vegetable gardening projects.

Recommendations for improvement of the gardening projects included: detailed project manuals should be developed, 4-H members, leaders and county agents need to be made more aware of the vegetable gardening bulletins available and 4-H members need to become aware of the experiences in gardening projects and related activities: demonstrations, judging, tours and exhibits.

CHAPTER 1

THE PROBLEM AND ITS SETTING

Four-H is a voluntary educational organization operating under the U.S. Department of Agriculture and Land Grant University System, specifically within the Cooperative Extension Service. Membership in 4-H is open to all boys and girls nine to nineteen years of age. Four-H is one of the largest voluntary youth organizations in the world. Since 1945, over 82 other countries have adopted the 4-H program. Currently, Montana has 10,100 members enrolled in nearly 700 clubs, (Montana Cooperative Extension Service, 1985).

The purpose of 4-H is to provide educational opportunities through project work and activities. When a 4-H member takes a project, he or she assumes responsibility for its completion. The 4-H program is designed to be flexible to meet the needs of the members of various age groups.

The main emphasis of project work is to "learn by doing", to have real life experiences, and to become a better adult. Throughout the project, members are

acquiring skills, knowledge, attitudes and experiences that will be of value to them throughout their lives.

After enrolling in a project, 4-H members receive materials outlined in the Montana Clover, a project guidelines bulletin, along with guidance from leaders, agents and family members to assist them in completing their project.

The Horticulture Program was initiated by the state 4-H staff in an attempt to provide experiences for today's youth. The Horticulture Program consists of ten projects, three of which deal directly with vegetable gardening. These three projects are project numbers 510 Vegetable Garden, 511 Experimental Garden and 512 Family/Production Garden. For purposes of this study, only these three projects were investigated. Initially, the Vegetable Gardening projects begin with planning and planting a small garden of 1000 square feet or less. The 4-H members are required to include at least six species of vegetables. In future years, they will increase the size of the garden, and the number of species grown, so that they will produce the family's needs of particular vegetables or so that they can sell their produce on the local market. The 4-H members are encouraged to learn what is best for their garden situation so they can

produce the highest quality vegetables possible. This is done, for example, by changing cultural practices, comparing varieties, using various planting dates, to mention a few.

Providing educational programs that meet the needs and interests of all 4-H youth has been a major concern of Cooperative Extension Service workers. A constant upgrading of the quality of 4-H programs is required not only to meet the needs and interest of the 4-H youth, but to satisfy public demands that benefits result from the Extension Service's efforts.

Evaluation is becoming increasingly important to the Cooperative Extension Service's program development and public relations. Evaluations help create concrete evidence of how individuals or groups are benefiting from the Cooperative Extension Service's efforts, or of where changes need to be made to improve programs. The key message is that the Cooperative Extension Service is making a conscientious effort to become more accountable by conducting and using evaluation results.

The Montana 4-H Vegetable Gardening projects have not been reviewed in depth since their creation in 1975. In order to provide an accountable educational program and to

let the public know that the Montana 4-H Vegetable Gardening projects are making a difference in the lives of people and communities, a study should be made to determine what direction the State 4-H Office should take. It is important to know how those directly involved with Vegetable Gardening projects feel about them. This study will help the State 4-H Office gain insight into the strengths and weaknesses of the project, in order to provide a viable educational program for the youth of Montana.

Statement of the Problem

This study was designed to investigate the perceptions of 4-H members, 4-H leaders and county agents toward the Montana 4-H Vegetable Gardening projects with respect to experiences and skills they feel are important to the projects, instructional materials, weaknesses and strengths of the projects, and recommendations for change or improvement of the projects.

Objectives

The objectives of this study were to:

1. Determine the importance of those skills that were acquired through participation in a Montana 4-H Vegetable Gardening project.

2. Determine those activities 4-H members became involved in while taking a Montana 4-H Vegetable Gardening project.
3. Determine whether or specific instructional materials are being used by 4-H members, 4-H leaders and county agents, and the adequacy of those instructional materials.
4. Determine the degree to which Montana 4-H members, 4-H leaders and county agents accomplish goals established at the state, and national level for the Vegetable Gardening projects.
5. Determine the strengths and weaknesses of the Montana 4-H Vegetable Gardening projects.
6. Formulate recommendations for the improvement of the Montana 4-H Vegetable Gardening projects.

Need for the Study

Paul Warner concluded in his report, "Looking Beyond Extension Stereotypes" (1983), that it is vital to include program participants in the Extension Service evaluation process. "There's a vast and profound neglect of the perceptions, experiences and reactions of the people who themselves are supposedly being served." Including program participants in evaluations should be done to

insure that the views of the public are truly being represented in the results of evaluations designed to assess the performance of the Extension Service.

It was determined, after a comprehensive computer search, that no current studies have been made regarding the 4-H Horticulture program, at the national or state level. This study not only gathered information to be used as a basis for analyzing 4-H Horticulture programs at the national and state levels, but it also included perceptions of program participants to insure that the performance of the Cooperative Extension Service is being accurately evaluated.

Efforts have been made to formulate goals and objectives for 4-H club work with the possibility that such an approach could aid Extension in its attempts to evaluate its efforts in youth work, and to formulate programs for the future.

Extension workers should be concerned about evaluating these goals and objectives set for the 4-H vegetable gardening projects. Interest in vegetable gardening is at its highest level since World War II. The U.S. Department of Agriculture reports that nearly half of

the households surveyed either had a garden or intended to have one, (Spittoesser, 1979).

Adequacy of instructional materials for 4-H programs is becoming increasingly important. In many states, 4-H projects account for almost one-third of the Extension publication budget. The printing of the bulletins is not the only cost involved. Time spent by the specialists, editors and artists must also be included.

Instructional materials from 4-H programs are not only used by the 4-H members, but also by 4-H leaders and county agents. Four-H members must be able to read and understand the instructional materials. In addition to being able to read and understand the instructional materials, the 4-H leader must be able to pass on the contents to the 4-H members. The county agents depend on the instructional materials for information to present to leaders participating in leader training programs or seeking information, (Reyburn, 1979).

This study should provide information on the adequacy of selective instructional materials used by 4-H members, 4-H leaders and county agents involved with the Montana 4-H vegetable gardening projects.

Definitions

Terms used consistently throughout the study are defined here in order to provide for an understanding of the terms for consistent interpretation.

4-H: A Cooperative Extension Service program designed to be an educational opportunity for the development of youth.

4-H Members: For the purpose of this study, 4-H members will be defined as those 4-H members, who enrolled in a Montana 4-H Vegetable Gardening Project in 1984.

4-H Leaders: Any adult who has given a majority of the advice and guidance concerning the Montana 4-H Vegetable Gardening project to 4-H members.

Montana 4-H Vegetable Gardening Projects: Three 4-H projects, (510 Vegetable Gardening, 511 Experimental Vegetable Gardening, and 512 Family/Production Garden), designed to teach 4-H members how to plan and plant a small garden, identify garden crops, develop skills for caring and using garden plants, grow garden plants, grow garden crops properly, and how to harvest and process garden crops.

Selective Instructional Materials: Literature dispursed by the Montana Cooperative Extension Service related to Vegetable Gardening.

Limitations

1. Only 4-H members, who in 1984, enrolled in a Montana 4-H vegetable gardening project were surveyed.
2. Only 4-H leaders who had given the majority of the advice and guidance concerning the Montana 4-H vegetable gardening projects to 4-H members were surveyed.

Assumptions

1. 4-H members, leaders and county agents are best qualified to determine the importance of the Montana vegetable gardening projects.

CHAPTER II

METHODOLOGY

Population and Sample

The total population of county agents for the study was determined by figuring out how many of the 56 counties in Montana had county agents. There were 49 counties with agents. These counties were listed alphabetically and then numbered from one to forty-nine.

The size of the sample was determined by figuring a confidence level of .90. This meant that 35 counties had to be sampled, (Vockell, 1983). Thirty-five numbers, ranging from one to forty-nine were randomly selected with the aid of the program, "Sample", taken from the Montana State University Statistical Package, (Lund, 1983). These numbers were then matched to the forty-nine numbers assigned to the counties, in order to determine which counties would be surveyed.

A representative group of 4-H members was identified from the State 4-H Office's records of enrollment. The population consisted of 4-H members, from the 35 counties chosen, who were enrolled in the Montana vegetable gardening projects in 1984. The total number of 4-H

members (429) enrolled in the Montana 4-H vegetable gardening projects, along with specific demographic data identifying each member was obtained from Bob Neely, Programmer Analyst, Extension Service, 107 Taylor Hall, Montana State University, Bozeman, MT 59717. The demographic data identifying each member contained information regarding club number, sex, residence, years in 4-H, year of birth, race and projects. This information was listed alphabetically by county and numbered from one to 429.

In order to obtain a .90 confidence level, 80 member surveys had to be returned. Based on a 55% return rate, the program, "Sample", was then used to randomly generate 145 numbers ranging from one to 429. These numbers were then matched to the numbers assigned to the demographic data. The demographic data was then compared with state enrollment sheets to obtain the names of 4-H members to be used in the survey.

A letter was sent to county agents asking them for the addresses of these 4-H members, along with the names and addresses of the 4-H vegetable gardening leaders who would have given the majority of advice and guidance regarding vegetable gardening to the 4-H members. Seventy-five leaders' names and addresses were returned.

The list of leaders was numbered one to 75. "Sample" was once again used to randomly generate 60 numbers, ranging from one to 75. The 60 numbers were based on a return rate of 80%, and a confidence level of .95. These numbers were then assigned to the list of leaders, in order to obtain the names of the leaders to be used in the survey.

Instrument Design

The questionnaires were designed to gather demographic information to aid in identifying and characterizing the respondents, and information about the perceptions of the respondents toward the Montana 4-H Vegetable Gardening projects with respect to activities and skills they felt were important to the project, instructional materials, projects, weaknesses and strengths of the projects, and recommendations for change or improvement of the program.

Questions for the study were generated by reviewing national and state publications related to 4-H vegetable gardening projects. National publications identified goals, skills, and activities that 4-H members should work toward while enrolled in a vegetable gardening project. State publications, specific to the vegetable gardening projects, identified goals, skills and activities 4-H

members should work toward at the state level. Jim Sargent, State Program Coordinator for 4-H and Youth, helped in formulating questions regarding skills, activities and demographic information. A list of vegetable gardening publications, available to 4-H members, leaders and county agents was obtained from the Extension Service mailing room at MSU. All of the work done in formulating the questionnaire was done under the advisement of the researcher's graduate committee members, and major advisor.

The closed form was used to gather information about activities, skills, instructional and projects, while the open-ended form was used to gather information related to weaknesses and strengths of the projects, and recommendations for change or improvement of the program. Portions of the questionnaires for the three groups were identical. These included the importance of skills obtained through 4-H Vegetable Gardening project work, importance of instructional materials, projects to be offered in future years, strengths and weaknesses of the the projects. Demographic questions were designed to relate to each of the respondent groups being surveyed.

Validity and reliability of the instrument were strengthened in two ways. First, the questionnaires were

as similar as was possible and secondly, the 4-H member instrument were pre-tested on a representative group of Gallatin County 4-H members. None of the 4-H members involved in the pre-test were included in the survey. The 4-H member instrument was also reviewed for readability and validity by June Welch, an elementary school teacher, the researcher's graduate committee members, and major advisor. Revisions to the questionnaires were made in accordance with information from the pre-test and the advice of the individuals listed above.

A cover letter including a brief explanation of the study and directions, along with the questionnaires were mailed out to the respondents during December of 1984. Non-respondents were sent a follow-up letter in January of 1985, describing the study and asking them to help improve the 4-H program by participating in the study. The same questionnaires used in the initial mailing was included in the follow-up mailing. No further follow-up procedures had to be taken, as an adequate rate of return had been received.

Analysis

The CP6 Honeywell Computer and "Yledit" Program were used to create a data file containing all of the information from the returned questionnaires.

Frequencies, percentages and general statistics were obtained through the Statistical Package for the Social Sciences. Tables were then developed to portray the statistical analysis in a descriptive form.

CHAPTER III

REVIEW OF RELATED LITERATURE

A review of the related literature does not identify investigations made on the "effectiveness" of the 4-H Vegetable Gardening Program, nationally or at the state level. However, other studies have been made which are relevant to this paper.

4-H and Today's Youth

As a result of 4-H being an integral part of the Cooperative Extension Service, the 4-H Program has developed and matured along with Extension. These two programs have moved from being primarily based on rural agricultural needs to programs that serve the needs of many people in many walks of life. The important areas of emphasis not only include agriculture, but home economics, public affairs and community development.

Expansion into urban areas has imposed new demands for the Extension and 4-H programs. As Oliver, (1977) stated, "The development for both rural and urban clientele has become essential".

Urbanization is not the only challenge to the 4-H Youth program. Today's youth are experiencing new levels of technology, new information and communications systems, new family structures, new values and attitudes, and new life styles. It is the responsibility of the 4-H program to help youth adapt to the changing environment and find ways to meet their needs.

To understand the purpose of the 4-H program, we must first understand the youth for which the program is designed. Youth need a voice in decisions that affect them, (Travis, 1980). Youth who choose to join 4-H do not choose to enroll in 4-H or undertake a project and do good or poorly for no reason at all, (Isaacs, 1978). When 4-H members were asked to relate why they joined 4-H, many said they thought it would be fun, they were interested in the projects, and they wanted to learn things. A motivational factor is involved to make them act in a fashion that will help them to achieve these goals. Understanding these motivational factors is essential to those involved with the educational interests of youth. Martin (1984), states: "Experience has shown that rural boys and girls remain in 4-H Club work longer if the program is based on their interests and needs". Many 4-H dropouts lose interest in club activities because they

feel they are left out of the workings of the club, (Petroff, 1983). It is essential that leaders learn to recognize youth's needs and concerns in order to develop programs that will help young people to become actively involved in 4-H and to address today's situations.

Toward Program Improvement

In order for Extension to obtain its goal of helping youth of our nation grow and develop, it must first establish the interests and concerns of youth, and it must realize the level of development of these youth.

Older youth, (16 to 18 year olds), may find 4-H less attractive because they feel they are a bit too old for 4-H. At this age they are becoming attracted to other activities, such as sports or music, (Wu, 1968). The 4-H program is designed to appeal to younger adolescents, the average age being 13.2 years old, (Stinson, 1981).

Four-H program planning must also be concerned with what the learner is expected to do after he/she has achieved an educational objective he/she could not do at the start. This ideal is the basis for 4-H project work. Extension workers must be able to guide youth to a higher level of learning, relating the objectives of the project to the objectives of the total 4-H program.

In transforming program planning efforts to educational objectives, Extension workers must realize the degree at which they wish to achieve these objectives. This realization may come about through creating an awareness of or changes in attitudes, values, goals and teaching skills.

Program Accountability

Evaluation has become an increasingly important tool in determining the accountability of the Extension and 4-H programs. The inevitable concern of taxpayers, politicians, and the federal government has been the driving force for evaluation. These people are concerned with why Extension should be supported with public funding.

Over the years, there has been a change in the focus of evaluation. During the 1960's, the primary focus was on objectives. "Does the program meet its stated objectives?" More recently "impact evaluations", evaluations of the overall program under consideration, have become important. Many Extension workers feel that because individuals acquire knowledge and skills, or because they have changes in attitudes and behaviors, there has been a definite impact made, (Pigg, 1980). Does the Extension Service have documented evidence that these

impacts actually occur, and to what degree do these impacts credit the program for federal funding? At present, the Extension Service has limited documented evidence of these impacts actually occurring. This is why there is an ever increasing need for evaluation research in this area. In order for the 4-H program to continue, it must be demonstrateably effective. This can be accomplished through evaluations.

All of those people involved in 4-H are challenged to think through the program strengths and weaknesses, what changes are needed to fit the environment, and how they can most effectively and efficiently serve the needs of youth.

The Evaluation Process

In some ways, the purpose and philosophies of the Extension Service relate to the evaluation process; both center on getting useful information to people, (Patton, 1983). Providing useful information to the public will result in more accountability and worth for the Extension Service. Evaluations can prove that benefits result from Extension programs.

In order to have effective educational programs in Extension and useful evaluations, many of the same questions must be answered. Getting useful information

out to people by Extension, has essentially become an evaluation process.

The following summary of the Extension Evaluation Process has been compiled from three separate reports published in the Journal of Extension. All of these reports identified the following steps to follow as being the most important in evaluating Extension programs.

> "Deciding the exact purpose of the evaluation may be the most important part in planning an evaluation. In deciding the purpose of an evaluation, one must consider whose needs are to be met by the evaluation, who will decide what the evaluation means, who will use this information and how will the results of the evaluation be used", (Smith, 1984).

The objectives of the program should be determined. These objectives should be a means of accomplishment and procedures for obtaining these objectives should be established. The objectives should relate to the program - do they reflect the purpose of the program?

In order to determine how well objectives are being met, performance standards should be set for each objective. Identifying these standards isn't easy; it often involves value judgements, (Smith, 1984).

A plan for obtaining evaluation information should be formed. It is important to identify how you can get the information, who can help get the information, from whom

data will be collected and when these duties should be performed.

Finally, the results should be reported to those who had been identified as the ones to use the information. This should be done in a timely manner. The report should explain the results of the study, indicate if standards were met and provide suggestions for redesign of the program.

Through evaluations, the Extension Service can provide useful information to the public. "Planning, implementing and reporting evaluations can have many practical benefits if the process produces credible results", (Smith, 1984). These results can be presented as useful information, increase citizen interest and awareness of programs and indicate to the public resources are being used wisely.

CHAPTER IV

RESULTS AND ANALYSIS

The results of this study are presented in seven sections, as follows:

Demographic Data
Skills Acquired through Participation in 4-H Vegetable Gardening Projects
Use and Helpfulness of Bulletins
Activities Participated by 4-H Members
Montana 4-H Vegetable Gardening Projects to be Offered in Future Years
Strengths and Weaknesses of the Gardening Projects
Recommendations for Improvement

Demographic Data

Data presented in this section describe each of the three respondent groups, county agents, 4-H leaders, and 4-H members. Date in Table 1 shows that a total of 240 individuals were sent questionnaires with 157 being returned for a response rate of 65.4%. The 240 individuals consisted of 35 county agents, 60 leaders and 145 members. The county agents were most responsive, with a response rate of 85.7%.

An 85.7% return rate from county agents resulted in a confidence level of 88.5%. A response of 73.3% from 4-H leaders resulted in a 91.8% confidence level. A

confidence level of 90.2% was obtained for a 57.2% return from 4-H members.

Table 1. Summary of Response by Group

Respondents	Number Sent	Number Received	Percent Return
Agents	35	30	85.7
Leaders	60	44	73.3
Members	145	83	57.2
Total	240	157	65.4

Date in Table 2 indicate that the average number of years of experience for county agents was 13 years. One hundred percent of the agents responded positively to the question, "Have you ever raised a vegetable garden?" A mean of 7.3 4-H members were helped by the county agents, while the average number of 4-H leaders assisted by the county agents was 3.2. The average number of years experience as a 4-H leader was 5.2. The percent of leaders responding positively to the question, "Have you ever raised a vegetable gardening project?" was 90.5. A mean of 2.6 4-H members were assisted by a 4-H leader.

The questionnaire provided information regarding the sex of the 4-H members. Of the 4-H members who responded, 42% were male, while 41% were female.

TABLE 2. LEADERS AND AGENTS EXPERIENCE

Group	Years Experience With Extension Service	Raise Garden				Members Helped	Leaders Helped
		Yes		No			
	$\bar{X}$	N	%	N	%	$\bar{X}$	$\bar{X}$
Agent	13.0	29	100	0	0.0	7.3	3.2
4-H Leader	5.2	38	90.5	9	9.5	2.6	NA

A review of the data in Table 3 indicate that 47 (58.8%) 4-H members responding were residing on a farm or ranch, with a total of 23 (28.8%) living in towns under 10,000.

TABLE 3. RESIDENCY OF 4-H MEMBERS (N=83)

Location	N	%
Farm or ranch	47	58.8
Town under 10,000, rural area	23	28.8
City 10,000 to 50,000	3	3.8
Suburb of city of 50,000	4	5.0
Central city over 50,000	3	3.8

A previous study done by Stintson in 1981, indicated the mean age of 4-H members was 13.2 years old. The data presented in Table 4 show the average age of 4-H members was 13.8 years old, with 50.7% (13.3 + 14.5 + 22.9) of the 4-H members between the ages of 12 and 14 years old.

Information in Table 5 indicates that 59 (25 + 34) of the 4-H members responding had been in 4-H for a period ranging from 1 to 4 years, with a mean of 3.8 years.

TABLE 4. AGE OF RESPONDENTS (N=83)

Age	N	%
9	1	1.2
10	4	4.8
11	8	9.6
12	11	13.3
13	12	14.5
14	19	22.9
15	7	8.4
16	11	13.3
17	5	6.0
18	3	3.6
19	2	2.4

Note: The mean age = 13.8 years old.

TABLE 5. 4-H MEMBERS' YEARS OF EXPERIENCE IN 4-H. (N=83)

Years	N	%
1-2	25	30.1
3-4	34	40.9
5-6	12	14.5
7-8	8	9.6
9	3	3.6

Note: The mean years = 3.8.

Data shown in Table 6 depict the enrollment of 4-H members involved in this study for the six year period of 1979 through 1984. The 510 Vegetable Gardening Project has had the largest percentage of 4-H members enrolled in it over the six-year period with an enrollment of 60% or more each year. The 511 Experimental Garden Project had the smallest percentage of 4-H members enrolled over the six-year period, with a "zero" enrollment for four out of the six years.

TABLE 6. VEGETABLE GARDENING PROJECT ENROLLMENT BY YEAR OF INVOLVEMENT. (N=83)

Year	Project 510 Vegetable Garden		511 Experiment Vegetable Garden		512 Farm/ Production	
	N	%	N	%	N	%
1984	59	81.9	0	0.0	13	18.1
1983	41	77.4	2	3.8	10	18.9
1982	23	67.6	2	5.9	9	10.8
1981	17	68.0	0	0.0	8	32.0
1980	12	75.0	0	0.0	4	75.0
1979	3	60.0	0	0.0	2	40.0

Skills Acquired Through Participation in 4-H Vegetable Gardening Projects

Data in Table 7 indicate that the four skills most frequently acquired by 4-H members were:

1. Recognizing weed problems (93.2%),
2. Planning the garden (91.9%),
3. Learning when to water (91.9%),
4. Filling out the record book (91.9%).

Data shown in Table 8 illustrate the skills taught by 4-H leaders. The three skills most frequently taught were:

1. Preparing vegetables for the fair (93.8%),
2. Planning the garden (90.9%),
3. Filling out the record book (90.9%).

Data in Tables 9, 10, and 11 illustrate ratings of the importance of vegetable gardening skills and also mean scores for these ratings. The ratings ranged from very

TABLE 7. SKILLS LEARNED BY 4-H MEMBERS

Skill	Yes		No	
	N	%	N	%
Recognize weed problems	69	93.2	5	6.8
Plan the garden	68	91.9	6	8.1
Learn when to water	68	91.9	6	8.1
Fill out record book	67	90.5	7	9.5
Control weed problems	65	87.8	9	12.2
Care for garden equipment	65	87.8	9	12.2
Prepare vegetable for fair	62	86.1	10	13.9
Identify root crop	60	81.1	14	18.9
Recognize insect problems	60	81.1	14	18.9
Learn when to thin	54	74.0	19	26.0
Identify fruit or seed crop	54	73.0	20	27.0
Control insect problems	53	73.6	19	26.4
Identify leafy vegetable	53	71.6	21	28.4
Select seed for Montana	51	68.9	23	31.1
Transplant vegetables	50	67.6	24	32.4
Budget time for project	49	66.2	25	33.8
Apply fertilizers	46	62.2	28	37.8
Keep records of costs	43	58.1	31	41.9
Plant successive crops	42	56.8	32	43.2
Recognize disease problems	40	54.1	34	45.9
Compute value of garden produce	39	52.7	35	47.3
Control disease problems	37	50.0	37	50.0
Compare yields	36	48.6	38	51.4
Make compost	34	45.9	40	54.1
Read fertilizer labels	32	43.2	42	56.8
Mulch the garden	30	40.5	44	59.5

important to not important. To average these ratings, responses were coded as very important = 1, important = 2, somewhat important = 3 and not important = 4.

The data in Table 9 present the ratings of importance of the vegetable gardening skills by 4-H members. In every case, 55% or more of the 4-H members responding

TABLE 8. SKILLS TAUGHT BY 4-H LEADERS (N=44)

Skill	Yes		No	
	N	%	N	%
Prepare vegetables for fair	30	93.8	2	6.3
Plan the garden	30	90.9	3	9.1
Fill out recordbook	30	90.9	3	9.1
Recognize weed problems	28	84.8	5	15.2
Keep records of costs of projects	28	84.8	5	15.2
Select seed for Montana	27	84.4	5	15.6
Control weed problems	27	81.8	6	18.2
Learn when to thin	25	78.1	7	21.9
Recognize insect problems	25	75.8	18	24.2
Transplant vegetables	23	74.2	8	25.8
Learn when to water	23	71.9	9	28.1
Control insect problems	23	69.7	10	30.3
Identify leafy vegetables	22	68.8	10	31.2
Compute value of garden produce	22	68.8	10	31.2
Identify root crop	21	65.6	11	34.4
Care for garden equipment	19	61.3	12	38.7
Apply fertilizers	19	57.6	14	42.4
Recognize disease problems	18	56.3	14	43.7
Control disease problems	18	56.3	14	43.7
Budget time for project	17	53.1	15	46.9
Identify fruit or seed crop	16	50.0	16	50.0
Mulch the garden	14	45.2	17	54.8
Plant successive crops	14	43.8	18	56.2
Read fertilizer labels	13	40.6	19	59.4
Compare yields	11	34.4	21	65.6
Make compost	9	29.0	22	71.0

Note: Percentages may vary because of nonresponses.

stated that the skills available were very important or important. Controlling weed problems ($\bar{X}$ = 1.47), controlling disease problems ($\bar{X}$ = 1.55), learning when to water ($\bar{X}$ = 1.55) and recognizing weed problems ($\bar{X}$ = 1.56) were on the average, more important to 4-H members than the other skills listed. (Based on $\bar{X}$'s). Although the

following skills were related as being important, learning how to mulch a garden ($\bar{X}$ = 2.33), and identifying fruit or seed crops ($\bar{X}$ = 2.33), root crops ($\bar{X}$ = 2.28) and leafy vegetables ($\bar{X}$ = 2.27) were the four skills, on the average, that were less important than the other skills listed.

The information in Table 10 illustrate the ratings of importance as received by 4-H leaders. The majority (17 out of 26) of the skills had at least 50% or more of the respondents listing them as important. On the average, selecting seed for Montana ($\bar{X}$ = 1.32), controlling insect problems ($\bar{X}$ = 1.52), recognizing insect problems ($\bar{X}$ = 1.55), and preparing vegetables for the fair ($\bar{X}$ = 1.55) were the more important skills identified by 4-H leaders. Identifying leafy vegetables ($\bar{X}$ = 2.43), making compost ($\bar{X}$ = 2.31), comparing yields ($\bar{X}$ = 2.27) and identify fruit or seed crops ($\bar{X}$ = 2.25) were the four skills, on the average, that were less important than the other skills listed.

The ratings of importance of vegetable gardening skills by county agents are shown in Table 11. Selecting seed for Montana ($\bar{X}$ = 1.35), learning when to water ($\bar{X}$ = 1.48), reading fertilizer labels ($\bar{X}$ = 1.62) and planning the garden ($\bar{X}$ = 1.66) were the four skills, on the

TABLE 9. IMPORTANCE OF SKILLS RATED BY 4-H MEMBERS

Skill	Ratings of Skills: Very Important N	Very Important %	Important N	Important %	Somewhat Important N	Somewhat Important %	Not Important N	Not Important %	$\bar{X}$	SD
Control weed problems	42	58.3	26	36.1	4	5.6	0	0.0	1.47	.604
Control disease problems	38	59.4	21	32.8	1	1.6	4	6.3	1.55	.815
Learn when to water	40	54.8	26	35.6	7	9.6	0	0.0	1.55	.668
Recognize weed problems	34	47.9	34	47.9	3	4.2	0	0.0	1.56	.579
Prepare vegetables for fair	38	52.8	26	36.1	8	11.1	0	0.0	1.58	.687
Recognize disease problems	34	54.0	25	39.7	0	0.0	4	6.3	1.59	.796
Select seed for Montana	35	49.3	29	40.8	6	8.5	1	1.4	1.62	.704
Recognize insect problems	33	47.8	32	46.4	1	1.4	3	4.3	1.62	.730
Control insect problems	35	48.6	29	40.3	6	8.3	2	2.8	1.65	.754
Fill out record book	31	44.9	25	36.2	13	18.8	0	0.0	1.74	.760
Apply fertilizers	26	38.8	31	46.3	8	11.9	2	3.0	1.79	.769
Plan the garden	27	37.5	31	43.1	13	18.1	1	1.4	1.83	.769
Care for garden equipment	21	30.4	36	52.2	9	13.0	3	4.3	1.91	.781
Learn when to thin	23	32.4	30	42.3	16	22.5	2	2.8	1.96	.818
Transplant vegetables	21	29.6	32	45.1	14	19.7	4	5.6	2.01	.853
Plant successive crops	21	33.9	24	38.7	12	19.4	5	8.1	2.02	.932
Compute value of garden produce	22	34.9	21	33.3	17	27.0	3	4.8	2.02	.907
Read fertilizer labels	10	16.4	37	60.7	11	18.8	3	4.9	2.12	.733
Budget time for project	11	17.2	35	54.7	17	26.6	1	1.6	2.13	.701
Make compost	17	27.9	21	34.4	20	32.8	3	4.9	2.15	.891
Keep records of cost of project	15	22.1	28	41.2	21	30.9	4	5.9	2.21	.856
Compare yields	15	25.9	20	34.5	18	31.0	5	8.6	2.22	.937
Identify leafy vegetables	12	17.9	27	40.3	26	38.8	2	3.0	2.27	.790
Identify root crop	11	16.2	28	41.2	28	41.2	1	1.5	2.28	.750
Identify fruit or seed crop	9	13.4	31	46.3	23	34.3	4	6.0	2.33	.786
Mulch a garden	11	17.5	29	46.0	14	22.2	9	14.3	2.33	.933

Note: Mean response was coded as very important = 1, important = 2, somewhat important = 3 and not important = 4.