



Some needed improvements in the Montana vocational agriculture program  
by D L MacDonald

A THESIS Submitted to the Graduate Committee In partial fulfillment of the requirements for the  
degree of Master of Science In Agricultural Education

Montana State University

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Abstract:

The program in vocational agriculture in Montana has been reviewed. The early program as developed up to 1924 is described and its weaknesses noted. An ideal program is described, showing that the present program needs to be improved by emphasizing the establishment of students in farming for themselves, by improving the teacher training program in technical agriculture so as to meet the needs of the agriculture teacher. Principal emphasis of this thesis was based on the opinions of 282 farmers as to the relative value of jobs their boys would be taught in school and also on a survey of the skills possessed by 38 vocational agriculture teachers to do the common farm jobs. the study brings out that farmers are of the opinion that many farm skills should be taught which are now being neglected and some non-functioning subject matter should be removed from the vocational agriculture course of study. Some of the skills the farmers believe should be taught are the veterinary jobs such as treating for bloat, lice, and milk fever. The selection of male and female breeding stock is of more importance to these farmers than knowing how to judge livestock according to show ring classification. In crop production the farmers are of the opinion that knowing how to control weeds and pests, and make machinery adjustments and repairs is of more importance to a farmer than botany of plants or history of grain varieties. The group rated all the farm management and conservation skills very high. The results of the survey on the ability of vocational agriculture teachers to do the farm skills indicates that the teacher training program in technical agriculture will have to be altered if the wishes of the farmers are to be regarded. It is recommended in this study that undergraduates be given the opportunity to learn the farm skills as well as the principles of scientific agriculture while in college. A suggested course of study that includes the skills to be taught is partially developed. It is recommended that the supervisors and teacher trainers work with the vocational agriculture instructors in developing a course of study that will contain more functioning subject matter as indicated by the opinions of the farmers. Establishment in farming of the students in vocational agriculture can be further improved by giving the trainees more actual experience in working with part-time classes and by the preparation of teaching material that will meet the needs of the group.

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A THESIS

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in

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for the degree of

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at

Montana State College

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## SOME NEEDED IMPROVEMENTS IN THE MONTANA VOCATIONAL AGRICULTURE PROGRAM

### Abstract

The program in vocational agriculture in Montana has been reviewed. The early program as developed up to 1924 is described and its weaknesses noted. An ideal program is described, showing that the present program needs to be improved by emphasizing the establishment of students in farming for themselves, by improving the content of the teaching program in all-day classes, and by improving the teacher training program in technical agriculture so as to meet the needs of the agriculture teacher.

Principal emphasis of this thesis was based on the opinions of 287 farmers as to the relative value of jobs their boys would be taught in school and also on a survey of the skills possessed by 38 vocational agriculture teachers to do the common farm jobs.

The study brings out that farmers are of the opinion that many farm skills should be taught which are now being neglected and some non-functioning subject matter should be removed from the vocational agriculture course of study. Some of the skills the farmers believe should be taught are the veterinary jobs such as treating for bloat, lice, and milk fever. The selection of male and female breeding stock is of more importance to these farmers than knowing how to judge livestock according to show ring classification. In crop production the farmers are of the opinion that knowing how to control weeds and pests, and make machinery adjustments and repairs is of more importance to a farmer than botany of plants or history of grain varieties. The group rated all the farm management and conservation skills very high.

The results of the survey on the ability of vocational agriculture teachers to do the farm skills indicates that the teacher training program in technical agriculture will have to be altered if the wishes of the farmers are to be regarded. It is recommended in this study that undergraduates be given the opportunity to learn the farm skills as well as the principles of scientific agriculture while in college.

A suggested course of study that includes the skills to be taught is partially developed. It is recommended that the supervisors and teacher trainers work with the vocational agriculture instructors in developing a course of study that will contain more functioning subject matter as indicated by the opinions of the farmers. Establishment in farming of the students in vocational agriculture can be further improved by giving the trainees more actual experience in working with part-time classes and by the preparation of teaching material that will meet the needs of this group.

### Historical

When a person analyzes the term "vocational agriculture" he considers that this term means training for the practice of agriculture. We all know that in the agricultural occupations there are many farm jobs that are essentially manipulative skills and that a training program of vocational agriculture should contain practice in learning how to do these manipulative and managerial skills in an approved way and in a true-to-life situation.

The early teacher of agriculture did not teach the subject from the vocational viewpoint of learning by doing. Instead, the textbook was followed very closely, the teacher assigning a certain number of pages each day without regard to type of agriculture found in the community or on the boy's farm.

It is not meant by the writer to show any contempt for agricultural textbooks because they are needed in teaching vocational agriculture. But they should not be used as a basic text for the course, because of the individual or localized problems of the boys who are members of the vocational agriculture classes.

Of the 2,175 schools which reported teaching agriculture for the year ending June 16, 1916, 1,521 reported that they taught it as an informational subject primarily (1). In a few cases there would be some laboratory experiments and outdoor observations given to supplement the material in the agricultural texts. But specific farm jobs or skills were seldom done by

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(1) Summaries of Studies in Agricultural Education, 1935. 195 pages. U. S. Office of Education, Department of the Interior. Vocational Education Bulletin #180.

the class.

Later, the vocational agriculture departments used the farm enterprises found in the local community as a basis for the agricultural courses of study. Crops found in the community would be studied one year and livestock the next year. Still, the actual doing of the farm job was given little time. As a matter of fact, the skill might be talked about but the student was seldom brought to the doing level.

The "supervised practice" course of study followed the "enterprise" type of course planning. This organization tended to bring the instruction closer to the type of farming found on each boy's farm. Each boy would carry several home projects, some of them extending over two, three, or four years. This type of instruction favored the development of long-time continuation projects, so that improved practices studied in the class room could be adopted by the boy on his home project. Under the enterprise organization, a dairy project might be in contact with the courses of study but one year; while under the "supervised practice" type the continuation project would maintain contact with the course of study for four years. This course of study is the most practical because the content arises from the needs of the boys in connection with their long-time supervised practice programs. If such a course of study is vocational the teacher should be able to do and teach the skills that the boy will meet in carrying out his supervised practice program.

A review of "Summaries of Studies in Agricultural Education" (2) showed

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(2) Summaries of Studies in Agricultural Education, 1935. 195 pages. U. S. Office of Education, Department of the Interior. Vocational Education Bulletin #180.

that twenty seven studies have been made on general curriculum building for agriculture based on the community survey.

S. S. Sutherland (3) developed a course of study in Farm Mechanics based on the opinions of 290 Montana farmers. The results of this investigation have been used in Montana to strengthen the farm mechanics phase of the vocational agriculture instruction.

H. M. Byram (4) used the judgments of master farmers constructing a curriculum in vocational agriculture as to the relative importance of training in farm management, livestock management, shop training, etc.

Sherman Dickinson (5) developed an investigation to find out what the dairy farmer needs to know, and therefore the desirable content of a course in dairy husbandry. Mr. Dickinson used the opinions of dairy farmers and dairy specialists in securing his data.

Except for the Dickinson study, which dealt with the dairy enterprise, the other investigations did not consider what farm skills and jobs within each agricultural enterprise a farmer holds vital in the operation of his farm.

That the farmers actually on the job should be able to give us some very valuable opinions as to what skills should be taught in a vocational

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(3) Sutherland, S. S. -"Suggested Course of Study in Farm Mechanics", 1929. Mimeographed bulletin, Department of Agricultural Education, Montana State College, Bozeman, Montana.

(4) Byram, H. M. -"The Use of Judgments of Master Farmers in Constructing the Curriculum in Vocational Agriculture", 1928. p. 75. Iowa State College, Ames, Iowa.

(5) Dickinson, Sherman -"A Method for Selecting the Desirable Content for Courses in Departments of Vocational Agriculture, Including a Group Test on Dairy Husbandry Information", 1929. University of Minnesota.

agriculture class is stressed by Franklin Bobbitt (6) when he states: "While educationists will of course lead, it is probable that the general community should assist in determining the several abilities which are to be developed within the younger generation-----It is they who make up the world of practical affairs and who perform the several activities."

#### Need for Studies of Course Content

Leaders and instructors in vocational agriculture generally believe that careful studies of the agriculture courses need to be made for specific areas and regions. Dr. Carsie Hammonds (7), Agricultural Teacher Trainer at the University of Kentucky, states: "It is perhaps not too much to say that our most baffling problem in vocational agriculture is what to teach - what learning to secure". Hammonds further states, "So far as I have been able to discover from curriculum researches, no one has determined a course of study in vocational agriculture on an objectively valid basis".

Dr. F. W. Lathrop (8), Specialist in Agricultural Education (research), U. S. Office of Education, says, "Any state may improve its program of vocational agriculture by continuous attention to courses of study".

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(6) Bobbitt, Franklin - "How to Make a Curriculum", 1924. Pages 38-286. Houghton Mifflin Co., Boston, Massachusetts.

(7) Hammonds, Carsie - "Evidences from Curriculum Researches of the Need for Further Studies", 1937. Agricultural Education, Vol. IX, no. 9, p. 133.

(8) Lathrop, F. W. - "Report of Twentieth Annual Pacific Regional Conference", 1938. U. S. Office of Education, Department of Interior. Page 96.

Review of Situation in Montana

The experience of the writer. The writer is a graduate of Montana State College, Division of Agriculture, Department of Agricultural Education, and has done graduate work at this institution and at Colorado Agricultural College. He has taught vocational agriculture for thirteen years, nine years of which were spent in the Gallatin County High School at Bozeman, Montana.

For five years he acted as supervisor of the practice teaching of vocational agriculture at Gallatin County High School. This work was done under the direction of the Agricultural Education teacher training department of Montana State College. During the past two years he has been assistant supervisor of Agricultural Education for the State Department of Vocational Education and instructor of Agricultural Education at Montana State College.

The program in 1924. When the writer entered the vocational agriculture field in 1924, the curriculum in agriculture included much traditional non-functioning subject matter such as making historical breed charts for the various classes of livestock and spending much time in learning how to test milk for butter fat. Neither of these are used to a great extent by a practical farmer in carrying on his farming operations. Much time was also spent in having the student read about the agricultural problems of the day and then the teacher would ask the student questions about what he had read. Even today some of the teachers in vocational agriculture use this question and answer method of instruction. It is a residue of "textbook"

agriculture, in the transition to the vocational basis in teaching agriculture and is rapidly being supplanted by more effective methods such as found in using the problem method of teaching. Very little time was given to field work except for some time spent in training livestock judging teams to compete in a state judging contest. Laboratory work was presented in an artificial way and the farms of the community were seldom used for study.

At that time (1924) the vocational agriculture program consisted of two years work. One-half of the day was devoted to vocational studies each year. The first year was equally divided between animal husbandry and farm shop and the second year between agronomy and farm shop. There was little attention or aid given to see whether or not the graduates of the departments were getting established in farming.

It will be noted that one-half of the time spent in the two-year program was devoted to farm shop. It is doubtful if this amount of time was justified because we know a farmer does not spend half of his time working in his shop.

The type of work being done in many of the school shops of that era was more closely allied to that found in a manual training room than that done in the shops of a practical farmer. The construction of foot stools, tabourets, etc., was taught rather than the more practical study of farm machinery adjustment and repair.

The home project program was considered by both the student and teacher as a requirement and not as an integral, living part of the vocational agriculture course.

In the training of teachers, actual participation in a high school

vocational agriculture program was non-existent in the professional field of training. At Montana State College, teaching experience was obtained by doing practice teaching in some non-vocational subject either at the Gallatin County High School or with the Veterans' Vocational Rehabilitation Department at Montana State College.

The effectiveness of the work at that time was doubtful. The goal of placing these young men in farming was a hazy ideal and since the farms of the community, or home farms of the boys, were seldom considered an important factor, there was little application on the farm of improved practices studied in school.

#### Present Objectives and Ideals in Vocational Agriculture

Since the chief function of vocational education in agriculture is to train all groups of men and boys on the farm for proficiency in farming, the following contributory aims or objectives have been set up for vocational agriculture (9).

1. To become established successfully in farming
2. To establish and maintain a satisfactory farm home
3. To produce agricultural products effectively
4. To use scientific knowledge and procedure in a farming occupation
5. To manage the farm business effectively
6. To market agricultural products economically
7. To cooperate intelligently in economic activities
8. To select and purchase suitable farm equipment and supplies
9. To perform appropriate economical farm mechanics activities
10. To participate in worthy rural civic and social activities
11. To exercise constructive leadership and to recognize and follow worthy leadership
12. To grow vocationally

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(9) "Training Objectives in Vocational Education in Agriculture" - Federal Board for Vocational Education, Bulletin #153, 1931. page 2.

These objectives now represent the ideals toward which the leaders in vocational agriculture are striving.

Establishment in farming. Of these objectives the first is no doubt the most important from the standpoint of the all-day student in vocational agriculture. It is imperative that as many young men as possible, who have studied vocational agriculture, become established in farming or the agricultural teacher is not meeting the most important objective of the work.

A teacher is not through with the student when he graduates from high school, but should follow the student's progress until he is established in farming. Even with a weak follow-up program we find that it was effective to a certain degree in placing graduates in farming. Those going into farming should approximate 100 per cent of the young men receiving vocational training instead of 60 per cent as found at the present time. The following table, compiled by the Federal Board for Vocational Education (10) shows the occupations followed by former students of vocational agriculture.

TABLE I

|                              | <u>1922</u> | <u>1927</u> | <u>1932</u> |
|------------------------------|-------------|-------------|-------------|
| Now farming                  | 59.0%       | 58.6%       | 63.8%       |
| In related occupations       | 6.0%        | 11.2%       | 5.5%        |
| In non-related occupations   | 11.0%       | 19.6%       | 19.9%       |
| In agricultural colleges     | 9.0%        | 2.7%        | 4.1%        |
| In non-agricultural colleges | 15.0%       | 7.9%        | 6.7%        |

The follow-up program in our vocational agriculture departments could be made much more effective if each department would sponsor a part-time class in which young farm men between the ages of 16 and 25 who are not yet

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(10) "Effectiveness of Vocational Education in Agriculture" - Federal Board for Vocational Education, Bulletin #82, 1932.

established on their own farms, would attend evening meetings in the high school agricultural room one or more nights per week. At these meetings the young men, under the leadership of the vocational agriculture teacher, would discuss managerial and production problems of the farm. By having these part-time classes the agriculture teacher would keep in contact with young men and could assist materially in guiding them in getting established in farming.

There has been some development along this line in Montana during the past two years. In 1937-38, twenty-two of the forty-five schools conducted part-time classes. This writer collaborated with the head of the Agricultural Education Department at Montana State College, Professor R. H. Palmer, in developing a bulletin entitled "Starting to Farm" (11) which will be used as a teacher guide in helping these young farmers find available farms, evaluating the farms, making out leases, etc. These problems are of vital importance to this group of young men who are so anxious to get established economically in life.

The all-day teaching program. An ideal course of study in vocational agriculture today is made upon the farming program of the individual boys home farm. The aims and objectives of vocational agriculture as set forth above are more closely adhered to under this method of instruction than when the course of study was based on a textbook. This course of study based on individual farming programs, demands much individual instruction. Only those jobs would be taught which could be applied by the boys in their farm programs.

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(11) Palmer, R. H. and MacDonald, D. L. - "Starting to Farm" - Mimeographed bulletin, 1939. State Board for Vocational Education, Helena, Montana.

Instead of the crops and soils, animal husbandry and farm shop courses, we would have the courses cross-sectioned so that Agriculture I, which is more or less exploratory, contains jobs in crops, soils, animal husbandry and farm shop. The second year students would spend their time in Agriculture II studying the enterprises covered in their supervised farming programs. Agriculture III and IV would be a continuation of the study of agriculture found on the boys' own farms. The school shop work would be taught in connection with the agriculture being studied and not as a separate subject.

Farm practice. The supervised farm practice program or home project refers in vocational agriculture to some particular enterprise, such as swine, wheat, or poultry, which is carried through the production and marketing cycle by the student under the guidance of the instructor. These projects have the following definite aims: to assist the boy in getting established in farming, making money, obtaining vocational experience in the skills and management of the particular enterprise found on his home farm, and to develop the responsibility of the boy. In the ideal course of study in vocational agriculture the project would be studied as a basic part of the subject.

Selection of subject matter. Non-functioning subject matter must be eliminated from the vocational agriculture course if we are to strive for the ideal.

The minimum teaching time allowed for vocational agriculture in Montana high schools has been reduced. This is shown in comparing the time requirements for vocational agriculture classes as stated in the Plan for Vocational

Agriculture published in 1932 (12) and that for 1937 (13). In 1932, 900 minutes per week was the minimum time required for each class in vocational agriculture, while in 1937 the minimum time requirement was only 420 minutes per week. This reduction in time devoted to vocational agriculture has been accompanied by the change from a 45-minute period to a 60-minute period in high school. In other words, instead of eight 45-minute periods per day, a high school will have six and in some cases only five 65-minute periods per day. This means that the academic high school classes meet for more time each day and the vocational periods are relatively shorter than they were.

The actual time spent on agriculture is further reduced when it is considered that assemblies, plays, debates, etc., are now held on school time more often than they were fifteen years ago. This further emphasizes the need for elimination of non-functioning subject matter in a vocational agriculture course, since less time will be spent in this subject.

The study of recent national emergency and long-time programs affecting agriculture has been added to the vocational agriculture courses. This addition is recommended in Vocational Education Bulletin #177 (14) which states, "It is recognized that there are many agencies, organizations, etc., which are attempting to perform services of value to farmers ..... (and we shall) ..... incorporate the programs of these groups into the

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(12) Course of Study High School Agriculture, 1932. p. 60. State Department of Public Instruction, Helena, Montana.

(13) Plans for Vocational Education, 1937-42. p. 23. State Department of Vocational Education, Helena, Montana.

(14) Vocational Agriculture in Relation to Economic and Social Adjustments - Vocational Education Bulletin #177, 1934. 67 pages. U. S. office of Education, Department of the Interior, Washington, D. C.

regularly organized instruction offered in vocational agriculture". This means that we are expected to remove some subject matter from our courses so that the Agricultural Adjustment Administration, Farm Credit Administration and similar agencies can be studied by members of the vocational agriculture classes.

Character training. The leadership, cooperation, and character training objectives for the young farmers of the all-day classes are set forth in the program of the Future Farmers of America. The purposes of this organization as set out in their manual are as follows: (15)

1. To develop competent, aggressive, rural and agricultural leadership. Future Farmers assume responsibility and are given that measure of competent guidance to assure the successful completion of worthwhile undertakings which are within the scope of experience, training and ability of the membership. All activities undertaken by a chapter are the result of the given chapter setting up its own program of activities each year. Members are encouraged to assume responsibility in order that they may be able to carry the burden of leadership that falls upon the shoulders of local leaders in every rural community.

2. To strengthen the confidence of the farm boy in himself and his work. The organization provides that each member may advance from grade to grade upon the basis of achievement. Ample opportunity is given for each to measure his agricultural and other skills and to make independent decisions. Suitable awards are made to those individuals and groups proving especially capable and worthy of recognition in chapter, state association, and national organization.

3. To create more interest in the intelligent choice of farming occupations.

4. To create and nurture a love of country life.

5. To improve the rural home and its surroundings. Such things as the improvement and beautification of the farm home and school grounds, providing labor-saving devices and modern conveniences, conservation projects, outings and travel make for increased appreciation of country life and the home.

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(15) Revised Manual for Future Farmers of America - The Future Farmers of America Organization. 1936. pages 5 and 6.

6. To encourage co-operative effort among students of vocational education in agriculture. Members avail themselves of the opportunity to co-operate in the purchase of pure seed, fertilizers, feed and the like, as well as to pool and sell co-operatively the farm products which are the result of their supervised farming work. Likewise, they act co-operatively for recreational purposes, for conservation of natural resources, in fire prevention, group insurance, group credit, relief of distress, and a multitude of other ventures adapted to group action.

7. To promote thrift among students of vocational agriculture--through the establishment of savings accounts and investments in agricultural enterprises.

8. To promote and improve scholarship. High standards of classroom and supervised farming achievement are demanded of members who advance from one degree to another.

9. To encourage organized recreational activities among students of vocational agriculture. Chapters hold Father-Son banquets, go on vacation tours, hold summer camps, and picnics, and provide a variety of group activities of an athletic character suitable to the season and facilities of the rural community. Local and state judging contests, agricultural plays, minstrels, public speaking contests, bands, orchestras and similar activities contribute to valuable outcomes of a recreational character.

10. To supplement the regular systematic instruction offered to students of vocational agriculture. The F. F. A. organization is a self-teaching device because the boy-initiated and boy-directed activities included in programs of work provide a wealth of actual practical experience which otherwise might not be available to the student. Such experience further improves the member as farmer and as a citizen.

11. To advance the cause of vocational education in agriculture in the public schools. The organization develops pride in the program of vocational agriculture through encouragement of superior results being achieved in supervised farming, and all activities relating to the vocational program and the work of the F. F. A. organization. The publication of news stories of chapter activities; state and chapter papers; radio programs; exhibits at local, county, state and national fairs and exhibitions; and window displays; are representative of activities to advance the cause of vocational education in agriculture.

Achievement of these objectives are a part of an ideal vocational agriculture program.

Teacher training. In an ideal situation, a teacher training program in vocational agriculture would contain a maximum amount of participation

in the skills of teaching and in the skills of farming. This is obvious, because of the fact that the trainee is being given training for a specific job. If he does not participate in the various skills and abilities that he will be expected to do when he starts on the jobs, he will be greatly handicapped. The vocational agriculture teacher is getting much more participation in his professional training at Montana State College at the present time than in the past. In technical agriculture there is still need for more participation in the agricultural skills and abilities, if the trainees are to leave college prepared to meet the demands of their vocation. This lack of abilities to do many of the technical skills will be discussed later.

Problems Which Need Attention If Ideal Vocational  
Agriculture Program Is To Be Attained

As has been shown in the previous section of this study there are many problems that need to be studied if we are to arrive at an ideal farmer training program in vocational agriculture. These problems may be grouped into first, the problem of follow-up of boys in all-day vocational agriculture classes; and second, the problem of teaching of subject matter that functions or is needed in a farmer training program.

1. Some progress has been made to improve the program in establishing boys in farming. In order to get Montana vocational agriculture teachers of the future to carry on a more systematic follow-up program of their all-day students, a more functioning course in part-time and adult education was inaugurated at Montana State College this year. Previous training in this line was not strong because it did not give the trainees actual participation

in the organization of such a class. He was only given the opportunity to observe such a class. This year all of the trainees in the senior class were required to assist in the organization and teaching of this type of class to two groups of farmers in Gallatin County. It is hoped these men will develop strong adult classes when they start teaching because they know, after this year's experience, that such classes can be organized as they have actually taught them.

2. From personal observation during the past two years it has been noted that there is much non-functional subject matter included in the courses of study in vocational agriculture. This may be caused by the fact that it is easier for the teacher to have the class recite about how to do some skill, such as remove the horns of a calf with caustic, than to do the job. The teachers are also spending too much time in farm mechanics. This belief was further emphasized on the writer's last visit to schools when it was noted that two of the three schools visited were devoting over fifty per cent of the vocational time to farm mechanics. We know that a practical farmer does not spend this much time on farm mechanics jobs.

From the above observations as to why non-functioning subject matter is so prevalent in our vocational agriculture courses of study, the following questions appear:

1. Do teachers know how to do practical farm jobs? During 1938 the writer worked on this problem (16). A questionnaire was developed that con-

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(16) MacDonald, D. L. - "Abilities of Vocational Agriculture Teachers to do the Common Farm Skills" - 1938. Department of Agricultural Education, Montana State College, Bozeman, Montana. Unpublished manuscript.

tained 249 skills found under fourteen farm enterprises. This questionnaire was checked by 38 teachers and 14 undergraduates. The list contained only part of the skills a farmer would need in carrying out his farming operations. Opposite each skill or job these questions were asked: 1. Whether or not the teacher had ever done the job himself; 2. whether he obtained his knowledge of the job in college or out of college; and 3. whether or not in his opinion an agricultural college graduate should know how to do that particular job.

Chart 1 on page 22 shows the ability of vocational agriculture teachers in Montana to do the farm skills and shows that on the whole they are not well trained in this phase of the work. Undergraduates were not considered in this chart.

2. Does pre-employment training fit them to do and teach farm jobs? This question was answered by the men answering the above questionnaire when they stated that they learned twice as many skills out of college as they learned in college. Also, Chart 2 on page 23 shows that these agriculture teachers "pick up" many of the skills after they graduate. It is doubtful if this method of learning skills is satisfactory when it is considered that the people who employ these men believe they know them because they are graduates of an agricultural college.

3. Should skills be taught in school or will young farmers pick them up on the farm? This point has been discussed by leaders in agricultural education but the farmer has seldom been asked for his opinion in the matter. This point will be discussed in detail.

CHART 1

NUMBER OF MEN WHO CAN DO 75% OR MORE OF THE  
JOB IN THE ENTERPRISES (38 men)



Can do 75% of Jobs



Cannot do 75% of Jobs

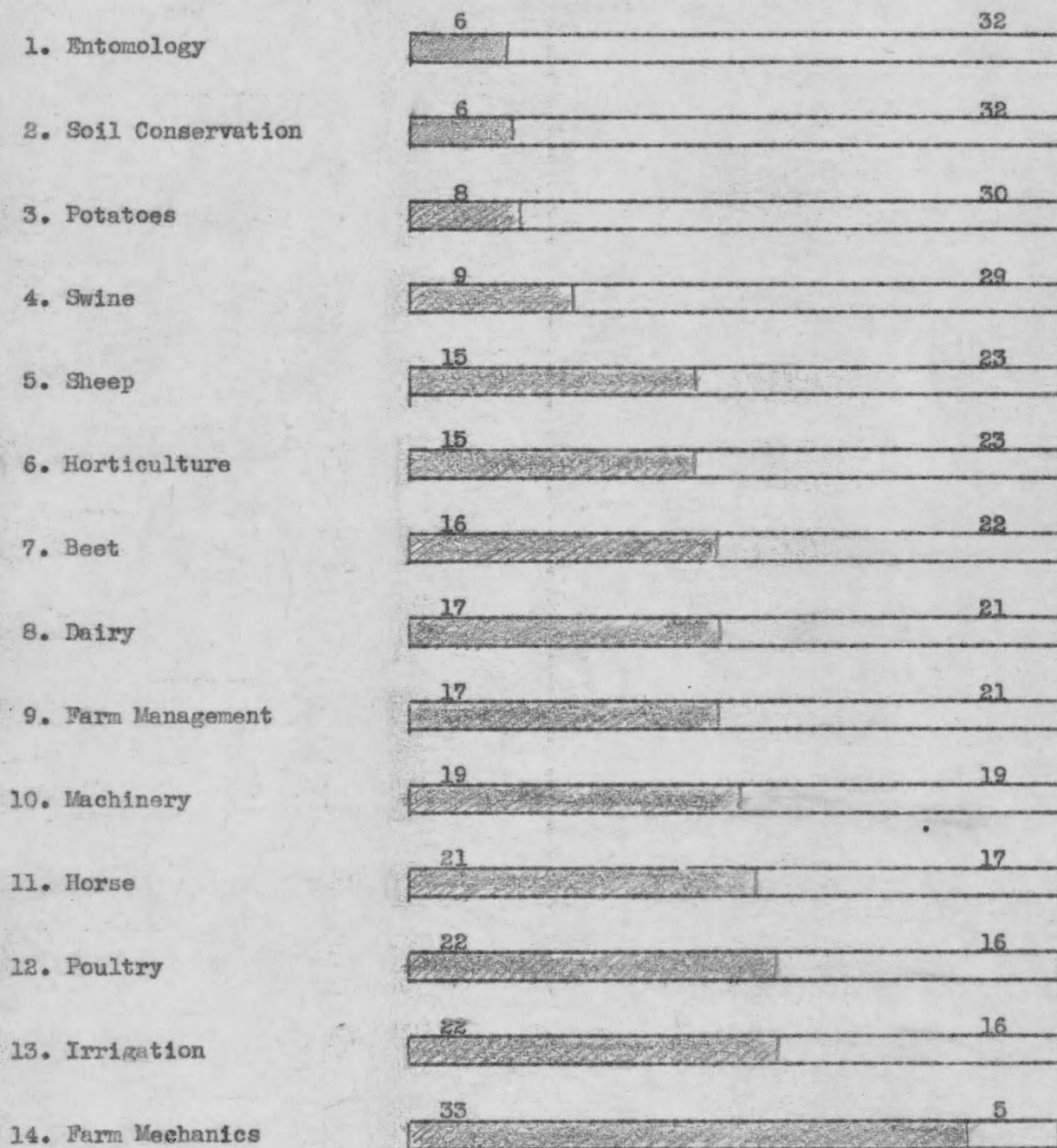
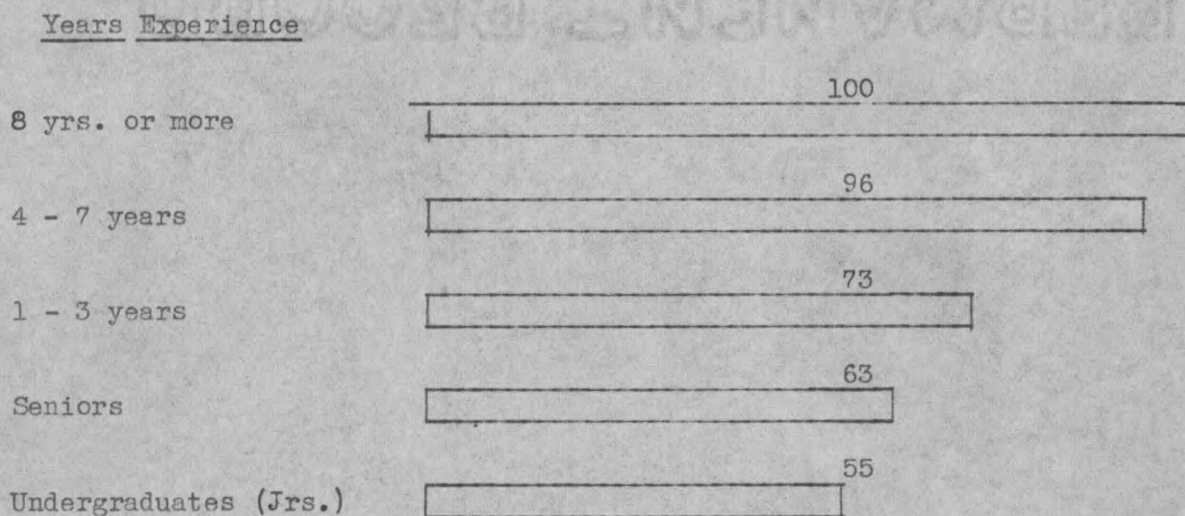


CHART 2

ABILITY TO DO JOBS IN ALL ENTERPRISES  
ACCORDING TO TEACHING EXPERIENCE

Based on ability of Teachers  
with 8 years or more experience  
(Index equals 100)



### Purpose of Study

The three major purposes of this study are:

1. To suggest a philosophy to guide in the development of a course of study for vocational agriculture in Montana.
2. To provide those administratively responsible for the development of Agricultural Education in Montana, with the necessary data so organized that they may arrive at a sound basis of judgment in developing a course of study to meet the needs of the state.
3. To provide a better basis on which to make changes in the teacher training program in Montana for teachers in service and undergraduate trainees.

### Statement of Problem

The specific problem which is reported in detail in this thesis is:

"What do the fathers of boys in vocational agriculture believe should be taught to their sons?"

If fathers of our future farmers generally have the opinion that common farm skills will be acquired by their sons through pick up methods then it would not be necessary to give this instruction in school.

If on the other hand, the fathers believe that their sons should be taught practical farm skills by the teacher, then distinct changes must be made in the teaching content of vocational agricultural classes.

The answer to this question should also help in determining the best technical instruction most needed in undergraduate training.

### Method of Procedure

A questionnaire was developed that included 136 skills and managerial jobs which a farmer has to do in the daily and seasonal operation of his farm. Also included in this list were a few exercises that are commonly taught in the vocational agriculture class room. A copy of the questionnaire and the letter that accompanied it may be found on pages 13 to 18.

The questionnaire was tried out experimentally with two local farmers to uncover any flaws in the questionnaire. After a slight revision 387 of the questionnaires were distributed to 29 of the vocational agricultural departments in the state. The number of questionnaires sent to each school was determined by the enrollment in the agricultural department. The instructors signed the letter that accompanied each questionnaire and gave it to boys in their vocational agriculture class whose fathers operate farms typical of the community.

It is believed that the opinions obtained in this study are of importance for the following reasons:

1. They are men over 35 years of age.
2. They believe in agriculture as a vocation or their boys would not be studying it in high school.
3. Only farmers interested in agriculture and the problems of teaching agriculture would take the time and trouble to fill out the questionnaire.
4. The teachers gave the questionnaire only to boys whose fathers they considered successful farmers.

Table No. I lists the schools to which questionnaires were sent.

TABLE II

SCHOOLS SENT QUESTIONNAIRES

Belgrade  
Belt  
Big Sandy  
Billings  
Bozeman  
Chester  
Chinook  
Choteau  
Conrad  
Culbertson

Deer Lodge  
Dillon  
Fort Benton  
Joplin  
Kalispell  
Laurel  
Lewistown  
Malta  
Manhattan  
Miles City

Missoula  
Moccasin  
Opheim  
Polson  
Scobey  
Sidney  
Stanford  
Valier  
Worden

LETTER ACCOMPANYING QUESTIONNAIRE

DEPARTMENT OF VOCATIONAL AGRICULTURE

High School

January 12, 1939

Dear Mr. Farmer:

We are trying to give your boy the best instruction possible in the vocational agricultural course he is taking in high school, and we want to know what you think your boy should be taught in this course. We believe that farmers, because of their practical experience in agriculture, can give us much valuable information as to what are the most important farm jobs and skills to be taught in the agricultural classes.

In order to take as little of your time as possible a number of common farm jobs and skills have been listed. We wish that you would make an "x" in the proper column according to your judgment. At present there are only  $1\frac{1}{2}$  hours each day available for teaching this work in high school so only the most important jobs can be taught.

Thank you for your cooperation in going over this list of farm jobs.

Yours truly,

Vocational Agricultural  
Instructor

COPY OF QUESTIONNAIRE

Type of farm you are operating:

Wheat \_\_\_\_\_  
 Cattle \_\_\_\_\_  
 Sheep \_\_\_\_\_  
 Diversified \_\_\_\_\_

LIVESTOCK

|                                                     | <u>Important</u> | <u>Average</u> | <u>Little Value</u> | <u>Don't Teach</u> |
|-----------------------------------------------------|------------------|----------------|---------------------|--------------------|
| Selecting of females for herd                       |                  |                |                     |                    |
| Selecting of bulls, bucks, boars for herd           |                  |                |                     |                    |
| Judging stock according to show ring classification |                  |                |                     |                    |
| Know history of breeds of livestock                 |                  |                |                     |                    |
| Identify 6 breeds of hogs, cattle, etc.             |                  |                |                     |                    |
| Ability to castrate (hogs, lambs, calf)             |                  |                |                     |                    |
| Ability to dehorn                                   |                  |                |                     |                    |
| Aid at difficult birth (hogs, sheep)                |                  |                |                     |                    |
| Remove afterbirth                                   |                  |                |                     |                    |
| Grow out young stock                                |                  |                |                     |                    |
| How to best use home grown feeds for livestock      |                  |                |                     |                    |
| How to balance a ration                             |                  |                |                     |                    |
| Rough stock through winter                          |                  |                |                     |                    |
| Hand mix feed (poultry & dairy)                     |                  |                |                     |                    |
| Tell age by teeth (sheep, horses)                   |                  |                |                     |                    |
| Butcher (hogs, beef, sheep, poultry)                |                  |                |                     |                    |
| Grade market livestock (hogs, beef, sheep, poultry) |                  |                |                     |                    |
| Perform post-mortem                                 |                  |                |                     |                    |
| Vaccinate (for blackleg, etc.)                      |                  |                |                     |                    |
| Drench stock                                        |                  |                |                     |                    |
| Recognize and treat common diseases of stock        |                  |                |                     |                    |
| Treat for maggots, footrot, scratches               |                  |                |                     |                    |
| Treat for worms                                     |                  |                |                     |                    |
| Treat for lice                                      |                  |                |                     |                    |
| Treat for milk fever                                |                  |                |                     |                    |
| Treat for bloat                                     |                  |                |                     |                    |
| Ring a bull                                         |                  |                |                     |                    |
| Trim feet of stock                                  |                  |                |                     |                    |
| Know principal livestock producing states in U. S.  |                  |                |                     |                    |
| Know how to register purebreds                      |                  |                |                     |                    |
| Cull poultry                                        |                  |                |                     |                    |
| Caponize                                            |                  |                |                     |                    |
| Candle eggs                                         |                  |                |                     |                    |
| Operate a brooder                                   |                  |                |                     |                    |
| Operate an incubator                                |                  |                |                     |                    |

## LIVESTOCK

| <u>LIVESTOCK</u>             | <u>Important</u> | <u>Average</u> | <u>Little Value</u> | <u>Don't Teach</u> |
|------------------------------|------------------|----------------|---------------------|--------------------|
| Treat for mites              |                  |                |                     |                    |
| Cure pork                    |                  |                |                     |                    |
| Remodeling of poultry house  |                  |                |                     |                    |
| Remove black teeth in pigs   |                  |                |                     |                    |
| Shear sheep                  |                  |                |                     |                    |
| Tag ewe                      |                  |                |                     |                    |
| Tie fleece                   |                  |                |                     |                    |
| Grade wool                   |                  |                |                     |                    |
| Flush ewes                   |                  |                |                     |                    |
| Raise burn lambs             |                  |                |                     |                    |
| Dock lambs                   |                  |                |                     |                    |
| Test milk for butter fat     |                  |                |                     |                    |
| Cool milk                    |                  |                |                     |                    |
| Bottle milk                  |                  |                |                     |                    |
| Adjust cream separator       |                  |                |                     |                    |
| Operate a milking machine    |                  |                |                     |                    |
| Make butter                  |                  |                |                     |                    |
| Make cheese                  |                  |                |                     |                    |
| Fatten out steer             |                  |                |                     |                    |
| Spay heifer                  |                  |                |                     |                    |
| Brand stock                  |                  |                |                     |                    |
| Throw an animal              |                  |                |                     |                    |
| Prepare stock for new ring   |                  |                |                     |                    |
| Shoe a horse                 |                  |                |                     |                    |
| Break a horse                |                  |                |                     |                    |
| Hitch up 5 to 12 horse teams |                  |                |                     |                    |
| Detect unsoundness in horse  |                  |                |                     |                    |

## CROPS

|                                           |  |  |  |  |
|-------------------------------------------|--|--|--|--|
| Adjust grain drill for rate of seeding    |  |  |  |  |
| Adjust mowers for register and alignment  |  |  |  |  |
| Sharpen sickles                           |  |  |  |  |
| Sharpen plow                              |  |  |  |  |
| Sharpen duckfoot shovels                  |  |  |  |  |
| Adjust knotter on binder                  |  |  |  |  |
| Adjust canvas on binder                   |  |  |  |  |
| Know 10 leading wheat states              |  |  |  |  |
| Test seed for germination                 |  |  |  |  |
| Select proper variety of grain to grow    |  |  |  |  |
| History of grain varieties                |  |  |  |  |
| How plants grow (Botany)                  |  |  |  |  |
| Treat for smut                            |  |  |  |  |
| Life history of smut spores               |  |  |  |  |
| Classify crops according to market grades |  |  |  |  |

| <u>CROPS</u>                                                 | <u>Imper-<br/>tant</u> | <u>Average</u> | <u>Little<br/>Value</u> | <u>Don't<br/>Teach</u> |
|--------------------------------------------------------------|------------------------|----------------|-------------------------|------------------------|
| Judge crops (wheat, oats, potatoes, etc.)                    |                        |                |                         |                        |
| Grade crops (wheat, oats, potatoes, etc.)                    |                        |                |                         |                        |
| Prepare seed and sheaf samples for show<br>at Fair           |                        |                |                         |                        |
| How flour is made                                            |                        |                |                         |                        |
| Measure irrigation water                                     |                        |                |                         |                        |
| Use of commercial fertilizer when<br>profitable              |                        |                |                         |                        |
| Identify and control 10 common insects<br>harmful to crops   |                        |                |                         |                        |
| Lay out land for plowing                                     |                        |                |                         |                        |
| Identify potato disease in field                             |                        |                |                         |                        |
| Identify chief potato varieties in<br>Montana                |                        |                |                         |                        |
| Cut potato seed                                              |                        |                |                         |                        |
| Make a spray mixture to control<br>potato pests              |                        |                |                         |                        |
| Store potatoes                                               |                        |                |                         |                        |
| Plan and grow a good farm garden                             |                        |                |                         |                        |
| Storage of garden truck                                      |                        |                |                         |                        |
| Prune trees, raspberries, etc.                               |                        |                |                         |                        |
| Prepare raspberries, currants, etc. for<br>winter            |                        |                |                         |                        |
| Select quality seed for forage crops                         |                        |                |                         |                        |
| Decide when to cut forage for hay                            |                        |                |                         |                        |
| How to measure hay in stack                                  |                        |                |                         |                        |
| Know most economical method of stacking<br>hay               |                        |                |                         |                        |
| Know how soil is formed                                      |                        |                |                         |                        |
| Read soil map                                                |                        |                |                         |                        |
| Know the different kinds of soil                             |                        |                |                         |                        |
| How to keep up soil fertility                                |                        |                |                         |                        |
| Determine soil types from soil maps                          |                        |                |                         |                        |
| Identify and control 10 weeds found<br>in Montana            |                        |                |                         |                        |
| <u>CONSERVATION</u>                                          |                        |                |                         |                        |
| Locate and build stake dam                                   |                        |                |                         |                        |
| Make a stock water reservoir                                 |                        |                |                         |                        |
| Lay out contours for irrigation                              |                        |                |                         |                        |
| Lay out fields for contour farming                           |                        |                |                         |                        |
| Lay out field for strip farming                              |                        |                |                         |                        |
| Operate farm level                                           |                        |                |                         |                        |
| Plant shelter belt                                           |                        |                |                         |                        |
| Identify 10 trees suitable for a<br>shelter belt             |                        |                |                         |                        |
| Develop basic soil and water conserva-<br>tion plan for farm |                        |                |                         |                        |

## MARKETING

- Read market reports
- When to market
- History of cooperatives
- Factors necessary for successful co-operative
- Roadside marketing
- How to order a car
- How to prepare and load a car (grain, potatoes, livestock)
- How to bill out a car
- How to mark livestock for shipping with a cooperative

## FARM MANAGEMENT

- Make a map of farm
- Make financial budget for farm
- Make an inventory of farm
- Keep financial and production records on a farm
- Analyze records of farm
- Plan labor schedule for farm
- Plan a livestock system for a farm
- Plan a cropping system for a farm
- Plan a rotation
- Determine proper outfit of machinery for a farm
- Proper use of credit
- Where and how to secure farm credit
- Make out lease for farm
- Know Agricultural Conservation regulations

[illegible]

Jobs you believe should be taught that are not listed:

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### Response

Of the 387 questionnaires distributed 282 were marked and returned. Nine of the questionnaires were removed from the study because of irregularities. This left a net of 273 questionnaires or 70.5 per cent of the total and is high enough to give an accurate representation of the opinions of the group to whom blanks were sent. This indicates the excellent cooperation given by the Smith-Hughes instructors and the patrons of the various schools.

### Results

Table II on page 34 shows a tabulated summary of the returns from all the farmers answering the questionnaire.

The skills are listed in order of their ranking by the farmers who returned the questionnaires. The jobs under each enterprise have been divided into three groups. Group I includes all those jobs receiving more marks in the "important" column than in all three other columns combined. Group II includes those jobs receiving more marks in the "important" column than in the "little value" and "do not teach" columns combined, the "average" column being disregarded. Group III includes those jobs which did not receive as many marks in the "important" column as the total marks of the "little value" and "don't teach" columns combined, the "average" group again being disregarded.

All jobs in Group I scored more than 120. This figure is about one-half the average total marks received by all items. The dividing line between Groups II and III is 69.

For example, of the 288 farmers who marked the job "know principal livestock producing states" under livestock, 33 consider it important, 78

as average, 86 little value, and 31 think it should not be taught. This job falls into Group III because when we add the "little value" and "do not teach" group together we find 111 farmer opinions weighed against the 33 who consider this job "important".

It would not be advisable from this summary to say just what jobs should or should not be taught. However, we can say in general that the Montana farmer believes all jobs listed in Group I are of enough importance to be given first attention and if there is time, Group II could supplement those jobs taught in Group I. Group III, if taught at all, should be on an individual basis.

TABLE NO. III

THE RELATIVE IMPORTANCE OF 136 AGRICULTURAL JOBS OR SKILLS  
BASED ON THE OPINIONS OF 272 MONTANA FARMERS

## Group I.

LIVESTOCK:

|                                                | <u>Important</u> | <u>Average</u> | <u>Little Value</u> | <u>Do Not Teach</u> |
|------------------------------------------------|------------------|----------------|---------------------|---------------------|
| Selecting of bulls, bucks, boars               | 221              | 26             | 4                   | 2                   |
| Recognize and treat common disease of stock    | 217              | 36             | 3                   | 2                   |
| Selecting females for herd                     | 194              | 51             | 9                   | 3                   |
| How to best use home grown feeds for livestock | 193              | 50             | 8                   | 3                   |
| Treat for bloat                                | 190              | 50             | 14                  | 3                   |
| Cull poultry                                   | 185              | 58             | 12                  | 4                   |
| Ability to castrate                            | 181              | 57             | 12                  | 8                   |
| Fatten out steer                               | 175              | 60             | 10                  | 7                   |
| How to balance a ration                        | 167              | 66             | 15                  | 6                   |
| Treat milk fever                               | 166              | 64             | 18                  | 6                   |
| Aid at difficult birth                         | 155              | 56             | 29                  | 9                   |
| Butcher                                        | 155              | 72             | 15                  | 9                   |
| Detect unsoundness in horse                    | 155              | 54             | 20                  | 18                  |
| Vaccinate                                      | 154              | 50             | 30                  | 15                  |
| Cure pork                                      | 150              | 63             | 20                  | 12                  |
| Treat for worms                                | 139              | 87             | 19                  | 4                   |
| Remove after-birth                             | 138              | 73             | 22                  | 11                  |
| Treat for maggots, footrot, scratches          | 135              | 83             | 25                  | 9                   |
| Grow out young stock                           | 134              | 83             | 16                  | 4                   |
| Tell age by teeth                              | 133              | 77             | 33                  | 7                   |
| Grade, market, livestock                       | 128              | 68             | 27                  | 8                   |
| Throw an animal                                | 127              | 72             | 29                  | 18                  |
| Break a horse                                  | 126              | 63             | 31                  | 25                  |
| Ability to dehorn                              | 125              | 81             | 33                  | 9                   |

## Group II.

|                           |     |     |    |    |
|---------------------------|-----|-----|----|----|
| Treat for lice            | 120 | 105 | 15 | 7  |
| Brand stock               | 119 | 75  | 27 | 23 |
| Hand mix feed             | 119 | 87  | 28 | 10 |
| Adjust cream separator    | 117 | 80  | 31 | 21 |
| Treat for mites           | 116 | 99  | 20 | 9  |
| Remodeling poultry house  | 111 | 91  | 28 | 12 |
| How to register purebreds | 110 | 81  | 50 | 10 |
| Drench stock              | 107 | 77  | 35 | 9  |
| Caponize                  | 101 | 95  | 48 | 10 |
| Test milk for butterfat   | 100 | 82  | 41 | 21 |

|                                         | <u>Important</u> | <u>Average</u> | <u>Little Value</u> | <u>Do Not Teach</u> |
|-----------------------------------------|------------------|----------------|---------------------|---------------------|
| <u>Livestock (con.)</u>                 |                  |                |                     |                     |
| Identify 6 breeds of hogs, cattle, etc. | 96               | 88             | 46                  | 12                  |
| Dock lambs                              | 95               | 52             | 49                  | 29                  |
| Roughstock through winter               | 93               | 105            | 33                  | 17                  |
| Remove black teeth in pigs              | 93               | 68             | 57                  | 25                  |
| Shoe a horse                            | 92               | 76             | 47                  | 30                  |
| Operate a brooder                       | 90               | 102            | 38                  | 11                  |
| Cool milk                               | 80               | 90             | 45                  | 21                  |
| Candle eggs                             | 77               | 110            | 45                  | 14                  |
| Perform post-mortem                     | 77               | 79             | 49                  | 14                  |
| Trim feet of stock                      | 75               | 98             | 48                  | 17                  |
| Prepare stock for show ring             | 72               | 96             | 51                  | 19                  |

Group III.

|                                                     |    |     |    |    |
|-----------------------------------------------------|----|-----|----|----|
| Judging stock according to show ring classification | 69 | 82  | 65 | 12 |
| Know history of breeds of livestock                 | 69 | 81  | 69 | 17 |
| Hitch up 5-12 horse teams                           | 67 | 61  | 58 | 52 |
| Operate an incubator                                | 66 | 105 | 47 | 21 |
| Make butter                                         | 64 | 76  | 58 | 40 |
| Spay heifer                                         | 63 | 78  | 63 | 36 |
| Operate a milking machine                           | 60 | 88  | 54 | 36 |
| Shear sheep                                         | 55 | 58  | 71 | 44 |
| Grade wool                                          | 54 | 86  | 52 | 36 |
| Tag ewe                                             | 53 | 73  | 67 | 37 |
| Flush ewes                                          | 53 | 81  | 52 | 38 |
| Ring a bull                                         | 53 | 87  | 79 | 20 |
| Make cheese                                         | 50 | 71  | 74 | 38 |
| Raise bum lambs                                     | 48 | 80  | 73 | 32 |
| Bottle milk                                         | 44 | 84  | 68 | 34 |
| Tie fleece                                          | 42 | 81  | 67 | 42 |
| Know principal L. S. producing states               | 33 | 78  | 86 | 31 |

CROPS:

Group I.

|                                        |     |    |    |    |
|----------------------------------------|-----|----|----|----|
| Select proper varieties of grain       | 203 | 40 | 12 | 1  |
| Identify and control weeds             | 190 | 46 | 13 | 3  |
| How keep up soil fertility             | 187 | 53 | 4  | 7  |
| Identify and control insects           | 184 | 53 | 11 | 4  |
| Treat for smut                         | 183 | 54 | 9  | 10 |
| Adjust grain drill for rate of seeding | 171 | 51 | 10 | 12 |

|                                            | <u>Important</u> | <u>Average</u> | <u>Little Value</u> | <u>Do Not Teach</u> |
|--------------------------------------------|------------------|----------------|---------------------|---------------------|
| <u>Crops (con.)</u>                        |                  |                |                     |                     |
| Decide when to cut forage for hay          | 171              | 66             | 7                   | 6                   |
| Test seed for germination                  | 170              | 65             | 14                  | 7                   |
| Plan and grow a good farm garden           | 166              | 67             | 10                  | 6                   |
| How to measure hay in stack                | 162              | 68             | 11                  | 10                  |
| Adjuster knotter on binder                 | 162              | 54             | 22                  | 13                  |
| Adjust mower                               | 158              | 66             | 12                  | 15                  |
| Identify potato disease in field           | 155              | 70             | 16                  | 8                   |
| Make spray mixture to control potato pests | 150              | 69             | 17                  | 8                   |
| Sharpen sickles                            | 150              | 73             | 16                  | 12                  |
| Select quality seed for forage crops       | 142              | 73             | 12                  | 10                  |
| Know most economical way of stacking hay   | 141              | 87             | 8                   | 9                   |
| Know the different kinds of soil           | 135              | 71             | 29                  | 8                   |
| Store potatoes                             | 131              | 80             | 18                  | 10                  |
| Use of commercial fertilizer               | 129              | 74             | 27                  | 13                  |
| Judge crops                                | 127              | 89             | 23                  | 6                   |
| Adjust canvas on binder                    | 127              | 73             | 34                  | 15                  |
| Grade crops                                | 125              | 87             | 19                  | 9                   |
| Cut potato seeds                           | 125              | 82             | 26                  | 10                  |
| Storage of garden truck                    | 120              | 89             | 17                  | 15                  |

Group II.

|                                           |     |     |    |    |
|-------------------------------------------|-----|-----|----|----|
| Sharpen plow                              | 119 | 77  | 35 | 17 |
| Measure irrigation water                  | 109 | 80  | 38 | 18 |
| Sharpen duckfoot shovels                  | 107 | 88  | 34 | 19 |
| Classify crops according to market grades | 103 | 98  | 26 | 13 |
| Lay out land for plowing                  | 101 | 83  | 38 | 13 |
| Prune trees, raspberries                  | 93  | 93  | 37 | 19 |
| Prepare raspberries, etc., for winter     | 83  | 83  | 36 | 29 |
| Identify potato varieties in Montana      | 79  | 110 | 33 | 11 |
| Know how soil is formed                   | 79  | 95  | 51 | 16 |
| Read soil map                             | 77  | 97  | 46 | 19 |
| Prepare seed and sheaf samples for rains  | 74  | 101 | 52 | 15 |
| Determine soil types from soil maps       | 72  | 111 | 32 | 17 |

Group III.

|                             |    |     |    |    |
|-----------------------------|----|-----|----|----|
| Life history of smut spores | 68 | 90  | 58 | 23 |
| History of grain varieties  | 60 | 99  | 59 | 24 |
| How plants grow (Botany)    | 57 | 104 | 47 | 28 |
| Know leading wheat states   | 38 | 89  | 83 | 31 |
| How flour is made           | 31 | 87  | 84 | 38 |

|  | <u>Important</u> | <u>Average</u> | <u>Little Value</u> | <u>Do Not Teach</u> |
|--|------------------|----------------|---------------------|---------------------|
|--|------------------|----------------|---------------------|---------------------|

CONSERVATION:

Group I.

|                                 |     |    |    |    |
|---------------------------------|-----|----|----|----|
| Lay out contours for irrigation | 128 | 76 | 23 | 12 |
| Operate farm level              | 121 | 84 | 29 | 11 |

Group II.

|                                                         |     |     |    |    |
|---------------------------------------------------------|-----|-----|----|----|
| Develop basic soil and water conservation plan for farm | 119 | 80  | 20 | 11 |
| Make a stock water reservoir                            | 112 | 81  | 34 | 12 |
| Plant shelter belt                                      | 111 | 94  | 19 | 11 |
| Identify trees suitable for a shelter                   | 102 | 95  | 25 | 14 |
| Lay out fields for contour farming                      | 98  | 95  | 29 | 13 |
| Lay out fields for strip farming                        | 95  | 103 | 26 | 14 |
| Locate and build stake dam                              | 92  | 70  | 43 | 15 |

MARKETING:

Group I.

|                                                     |     |    |    |    |
|-----------------------------------------------------|-----|----|----|----|
| When to market                                      | 179 | 54 | 6  | 5  |
| Read market reports                                 | 147 | 70 | 11 | 11 |
| How to prepare and load a car                       | 128 | 74 | 27 | 14 |
| How to mark livestock for shipping with cooperative | 120 | 82 | 27 | 11 |

Group II.

|                                              |     |    |    |    |
|----------------------------------------------|-----|----|----|----|
| How to bill out a car                        | 114 | 83 | 29 | 14 |
| How to order a car                           | 97  | 80 | 37 | 28 |
| Factors necessary for successful cooperative | 94  | 99 | 28 | 15 |
| History of cooperatives                      | 86  | 93 | 46 | 12 |

Group III.

|                    |    |    |    |    |
|--------------------|----|----|----|----|
| Roadside marketing | 36 | 82 | 81 | 34 |
|--------------------|----|----|----|----|

FARM MANAGEMENT:

Group I.

|                                       |     |    |    |   |
|---------------------------------------|-----|----|----|---|
| Keep financial and production records | 205 | 40 | 4  | 4 |
| Plan a cropping system                | 185 | 49 | 10 | 3 |
| Plan a rotation                       | 179 | 52 | 4  | 5 |

|                                            | <u>Important</u> | <u>Average</u> | <u>Little Value</u> | <u>Do Not Teach</u> |
|--------------------------------------------|------------------|----------------|---------------------|---------------------|
| <u>Farm Management (con.)</u>              |                  |                |                     |                     |
| Determine proper outfit of machinery       | 179              | 53             | 9                   | 3                   |
| Make financial budget                      | 177              | 56             | 9                   | 6                   |
| Make inventory                             | 177              | 59             | 11                  | 4                   |
| Proper use of credit                       | 175              | 48             | 11                  | 9                   |
| Plan livestock system                      | 173              | 60             | 9                   | 6                   |
| Know Agricultural Conservation Regulations | 152              | 71             | 12                  | 10                  |
| Where and how to secure credit             | 143              | 61             | 20                  | 14                  |
| Analyze records                            | 142              | 80             | 10                  | 6                   |
| Make out lease                             | 142              | 70             | 18                  | 10                  |
| Plan labor schedule                        | 135              | 76             | 24                  | 10                  |
| Make map of farm                           | 129              | 79             | 26                  | 9                   |

Summary of Table III

In Table III are shown definite jobs which farmers believe should be taught in a vocational agriculture course. Some general deductions follow.

1. Veterinary jobs are considered very important by nearly all farmers as is shown by their placing eleven of the fifteen jobs of this type in the first group. Treating for bloot, lice, milk fever, worms, footrot, vaccinating for blackleg, and castrating are all jobs the farmers believe should be taught.

2. The selecting of male and female breeding stock for the home herd is considered of more importance than training in judging animals according to show ring classifications, preparing stock for the show ring and knowing the history of breeds of livestock or the principal livestock producing states. The latter are being commonly taught in the vocational agriculture departments.

3. These farmers are of the opinion that feeding jobs are of importance, especially how best to use home grown feed, fatten steers, grow out young stock and how to balance a ration.

4. All of the specific sheep jobs, except castrating and docking lambs are found in the third group. Perhaps this can be explained by the fact that most of these jobs are done by specialists and the farmers who do have sheep would rather pay to have these jobs done than to learn how to do them themselves.

5. The influence of the tractor is shown by the farmers putting the job of hitching large teams in the third group. Of course, this is a job that is taught most farm boys by their fathers long before they start to high school.

6. That these farmers are vitally interested in a live-at-home program is shown by the relative importance they place on home butchering, curing pork, growing a good farm garden, storage of garden truck, and potatoes.

7. In crop production farm machinery adjustments rank very high in farmer opinion as does identification and control of weeds and insects. Also included in the group are selection of proper varieties to grow, identification and control of crop diseases, maintaining soil fertility and knowledge of different soils in the community. These farmers do not consider it necessary for their boys to know the history of grain varieties, the botany of plants, ten leading wheat states or how flour is made--items commonly receiving much time in the present program.

8. Under the list of conservation jobs the farmers consider all of the skills of more or less importance as is shown by the narrow spread between the first and last items. Laying out contours for irrigation and the operation of a farm level lead the list. These two jobs are closely followed by the ability to develop a basic soil and water conservation plan for a farm. None of the jobs in this class are placed in the third group.

9. These men also believe that their boys should be taught many of the jobs and abilities in marketing of their farm products. It was to be expected that they would place roadside marketing in the third group.

10. The ability to plan the management of the farm business is considered of great importance by this group because all of the items were placed in the first group. It is interesting to note so many farmers emphasizing the importance of keeping farm records and believing their boys should be taught the job.

TABLE NO. IV

THE RELATIVE IMPORTANCE OF 136 AGRICULTURAL SKILLS OR JOBS  
BASED ON THE OPINIONS OF 60 FARMERS ON STRAIGHT WHEAT FARMS

LIVESTOCK:

Group I.

|                                                         | <u>Important</u> | <u>Average</u> | <u>Little Value</u> | <u>Do Not Teach</u> |
|---------------------------------------------------------|------------------|----------------|---------------------|---------------------|
| Selecting bulls, bucks, boars                           | 42               | 8              | 1                   | 1                   |
| Selecting females for herd                              | 40               | 10             | 1                   | 1                   |
| How best to recognize and treat common disease of stock | 39               | 10             | 0                   | 0                   |
| How best to use home grown feeds for livestock          | 36               | 8              | 2                   | 2                   |
| Ability to castrate                                     | 33               | 16             | 1                   | 3                   |
| Treat for bloat                                         | 31               | 15             | 3                   | 1                   |
| Fatten out steer                                        | 31               | 15             | 2                   | 1                   |
| How to balance a ration                                 | 31               | 13             | 3                   | 1                   |
| Butcher                                                 | 30               | 13             | 4                   | 3                   |
| Remove after-birth                                      | 30               | 14             | 5                   | 1                   |
| Cull poultry                                            | 29               | 16             | 3                   | 2                   |
| Vaccinate                                               | 29               | 15             | 4                   | 1                   |
| Cure pork                                               | 28               | 12             | 3                   | 2                   |
| Grow out young stock                                    | 28               | 14             | 3                   | 2                   |
| Ability to dehorn                                       | 27               | 17             | 3                   | 2                   |
| Aid at difficult birth                                  | 27               | 13             | 12                  | 1                   |
| How to register purebreds                               | 24               | 17             | 8                   | 1                   |
| Grade, market, livestock                                | 23               | 13             | 5                   | 2                   |
| Detect unsoundness in horse                             | 23               | 11             | 8                   | 2                   |

Group II.

|                                       |    |    |    |   |
|---------------------------------------|----|----|----|---|
| Treat milk fever                      | 21 | 17 | 6  | 1 |
| Tell age by teeth                     | 21 | 24 | 5  | 0 |
| Throw an animal                       | 20 | 20 | 5  | 3 |
| Brand stock                           | 19 | 19 | 6  | 3 |
| Hand mix feed                         | 19 | 20 | 5  | 1 |
| Treat for worms                       | 19 | 23 | 6  | 0 |
| Shoe horse                            | 18 | 12 | 13 | 5 |
| Break a horse                         | 18 | 17 | 10 | 2 |
| Drench stock                          | 18 | 18 | 5  | 1 |
| Adjust cream separator                | 18 | 18 | 6  | 5 |
| Caponize                              | 18 | 18 | 11 | 2 |
| Rough stock through winter            | 18 | 17 | 8  | 4 |
| Treat for maggots, footrot, scratches | 17 | 21 | 7  | 2 |
| Remodeling poultry house              | 17 | 26 | 3  | 3 |
| Test milk for butterfat               | 17 | 20 | 7  | 5 |
| Treat for mites                       | 15 | 25 | 2  | 3 |
| Treat for lice                        | 15 | 27 | 4  | 3 |

|                                                      | <u>Important</u> | <u>Average</u> | <u>Little Value</u> | <u>Do Not Teach</u> |
|------------------------------------------------------|------------------|----------------|---------------------|---------------------|
| <u>Livestock (con.)</u>                              |                  |                |                     |                     |
| Prepare stock for show ring                          | 15               | 20             | 5                   | 5                   |
| Identify 6 breeds of livestock<br>hogs, cattle, etc. | 14               | 20             | 11                  | 1                   |
| Operate an incubator                                 | 12               | 28             | 6                   | 2                   |
| Operate a brooder                                    | 10               | 30             | 5                   | 2                   |

Group III.

|                                                        |    |    |    |   |
|--------------------------------------------------------|----|----|----|---|
| Know history of breeds of livestock                    | 16 | 16 | 15 | 2 |
| Perform post mortem                                    | 14 | 12 | 15 | 4 |
| Remove black teeth in pigs                             | 13 | 20 | 10 | 3 |
| Dock lambs                                             | 11 | 15 | 10 | 7 |
| Judging stock according to show ring<br>classification | 11 | 20 | 11 | 2 |
| Cool milk                                              | 11 | 19 | 12 | 5 |
| Make butter                                            | 11 | 17 | 11 | 7 |
| Ring a bull                                            | 10 | 20 | 13 | 8 |
| Trim feet of stock                                     | 10 | 23 | 10 | 5 |
| Spay heifer                                            | 10 | 15 | 15 | 6 |
| Operate a milking machine                              | 9  | 22 | 9  | 5 |
| Hitch up 5-12 horse teams                              | 8  | 14 | 14 | 8 |
| Shear sheep                                            | 8  | 12 | 14 | 6 |
| Flush ewes                                             | 8  | 15 | 14 | 6 |
| Raise bum lambs                                        | 8  | 16 | 14 | 7 |
| Candle eggs                                            | 8  | 26 | 12 | 1 |
| Grade wool                                             | 7  | 20 | 11 | 6 |
| Bottle milk                                            | 7  | 16 | 15 | 8 |
| Tag ewe                                                | 6  | 14 | 19 | 5 |
| Know principal L. S. producing states                  | 6  | 11 | 21 | 6 |
| Make cheese                                            | 6  | 15 | 13 | 8 |
| Tie fleece                                             | 6  | 17 | 16 | 6 |

CROPS

Group I.

|                                        |    |    |   |   |
|----------------------------------------|----|----|---|---|
| Select proper varieties of grain       | 40 | 7  | 4 | 1 |
| Keep up soil fertility                 | 39 | 8  | 0 | 2 |
| Identify and control insects           | 38 | 14 | 1 | 2 |
| Adjust grain drill for rate of seeding | 38 | 10 | 4 | 1 |
| Test seed for germination              | 37 | 10 | 3 | 3 |
| Treat for smut                         | 37 | 13 | 1 | 1 |
| Plan and grow a good farm garden       | 33 | 14 | 2 | 3 |
| Adjust mower                           | 32 | 12 | 1 | 3 |
| Identify and control weeds             | 31 | 13 | 3 | 2 |
| Sharpen sickles                        | 29 | 18 | 2 | 2 |
| Decide when to cut forage for hay      | 28 | 20 | 3 | 0 |

|                                            | <u>Important</u> | <u>Average</u> | <u>Little Value</u> | <u>Do Not Teach</u> |
|--------------------------------------------|------------------|----------------|---------------------|---------------------|
| <u>Crops (con.)</u>                        |                  |                |                     |                     |
| Know the different kinds of soil           | 28               | 12             | 8                   | 3                   |
| Economical way of stacking hay             | 27               | 19             | 2                   | 2                   |
| Adjust knotter on binder                   | 26               | 17             | 4                   | 2                   |
| Judge crops                                | 26               | 17             | 4                   | 2                   |
| Make spray mixture to control potato pests | 25               | 15             | 3                   | 4                   |
| Grade crops                                | 24               | 15             | 4                   | 5                   |
| Lay out land for plowing                   | 23               | 13             | 7                   | 2                   |

Group II.

|                                          |    |    |    |   |
|------------------------------------------|----|----|----|---|
| Identify potato disease in field         | 23 | 17 | 5  | 3 |
| Measure hay in stack                     | 23 | 21 | 4  | 2 |
| Storage of garden truck                  | 22 | 20 | 3  | 4 |
| Cut potato seeds                         | 21 | 20 | 1  | 5 |
| Select quality seed for forage crops     | 21 | 20 | 4  | 4 |
| Sharpen plow                             | 20 | 25 | 5  | 2 |
| Sharpen duckfoot shovels                 | 20 | 25 | 5  | 2 |
| Use of commercial fertilizer             | 19 | 16 | 9  | 4 |
| Adjust canvas on binder                  | 17 | 20 | 7  | 4 |
| Prune trees, raspberries                 | 17 | 21 | 7  | 3 |
| Determine soil types from soil maps      | 17 | 18 | 8  | 4 |
| Read soil map                            | 16 | 19 | 8  | 5 |
| Know how soil is formed                  | 16 | 20 | 10 | 3 |
| Store potatoes                           | 16 | 22 | 5  | 3 |
| Classify crops according to m'k't grades | 15 | 23 | 4  | 5 |
| Prepare seed and sheaf samples for fairs | 14 | 24 | 6  | 4 |
| Identify potato varieties in Montana     | 12 | 25 | 5  | 3 |

Group III.

|                                       |    |    |    |    |
|---------------------------------------|----|----|----|----|
| Measure for water                     | 16 | 13 | 12 | 6  |
| Prepare raspberries, etc., for winter | 13 | 17 | 9  | 6  |
| Life history of smut spores           | 12 | 21 | 9  | 6  |
| History of grain varieties            | 11 | 17 | 15 | 6  |
| How plants grow (Botany)              | 11 | 21 | 8  | 9  |
| Know leading wheat states             | 8  | 15 | 15 | 10 |
| How flour is made                     | 6  | 20 | 15 | 8  |

|  | <u>Important</u> | <u>Average</u> | <u>Little Value</u> | <u>Do Not Teach</u> |
|--|------------------|----------------|---------------------|---------------------|
|--|------------------|----------------|---------------------|---------------------|

CONSERVATION:

Group I.

|                                                         |    |    |   |   |
|---------------------------------------------------------|----|----|---|---|
| Plant shelterbelt                                       | 27 | 15 | 4 | 2 |
| Develop basic soil and water conservation plan for farm | 25 | 16 | 4 | 2 |
| Lay out fields for strip farming                        | 24 | 22 | 4 | 0 |

Group II.

|                                           |    |    |   |   |
|-------------------------------------------|----|----|---|---|
| Locate and build stake dam                | 21 | 15 | 5 | 1 |
| Lay out contours for irrigation           | 21 | 15 | 6 | 3 |
| Identify trees suitable for a shelterbelt | 21 | 19 | 3 | 2 |
| Make a stock water reservoir              | 20 | 17 | 7 | 1 |
| Operate farm level                        | 19 | 17 | 8 | 2 |
| Lay out fields for contour farming        | 18 | 20 | 7 | 3 |

MARKETING:

Group I.

|                     |    |    |   |   |
|---------------------|----|----|---|---|
| When to market      | 34 | 15 | 1 | 1 |
| Read market reports | 27 | 19 | 3 | 3 |

Group II.

|                                                     |    |    |   |   |
|-----------------------------------------------------|----|----|---|---|
| How to prepare and load a car                       | 22 | 17 | 6 | 4 |
| How to mark livestock for shipping with cooperative | 21 | 20 | 5 | 2 |
| How to bill out a car                               | 19 | 20 | 6 | 4 |
| Factors necessary for successful cooperative        | 16 | 20 | 2 | 9 |
| History of cooperative                              | 13 | 22 | 8 | 4 |

Group III.

|                    |    |    |    |   |
|--------------------|----|----|----|---|
| How to order a car | 13 | 19 | 9  | 8 |
| Roadside marketing | 3  | 16 | 22 | 7 |

FARM MANAGEMENT:

Group I.

|                        |    |   |   |   |
|------------------------|----|---|---|---|
| Keep financial records | 46 | 6 | 1 | 1 |
| Make financial budget  | 39 | 7 | 3 | 2 |

|                                            | <u>Important</u> | <u>Average</u> | <u>Little Value</u> | <u>Do Not Teach</u> |
|--------------------------------------------|------------------|----------------|---------------------|---------------------|
| <u>Farm Management (con.)</u>              |                  |                |                     |                     |
| Determine proper outfit of machinery       | 39               | 10             | 1                   | 0                   |
| Know Agricultural Conservation Regulations | 36               | 11             | 2                   | 2                   |
| Make inventory                             | 36               | 11             | 3                   | 2                   |
| Plan a cropping system                     | 35               | 13             | 2                   | 1                   |
| Plan labor schedule                        | 32               | 12             | 4                   | 3                   |
| Plan livestock system                      | 31               | 16             | 1                   | 2                   |
| Proper use of credit                       | 31               | 10             | 3                   | 5                   |
| Plan a rotation                            | 31               | 14             | 1                   | 1                   |
| Analyse records                            | 28               | 15             | 2                   | 2                   |
| Where and how to secure credit             | 25               | 12             | 6                   | 4                   |
| Make out lease                             | 25               | 14             | 6                   | 3                   |
| Make map of farm                           | 25               | 20             | 3                   | 2                   |

Summary of Table IV

In order to discover to what extent farmers operating straight wheat farms would differ in opinion as to the relative value of the farm skills listed, this group of replies was tabulated separately. The results are shown in Table IV, page 41.

It will be noted that the wheat farmers follow very closely the opinions given all farmers combined as to the relative importance of the skills. This is especially true of the skills found in Group III.

These men believe that the selection of male and female breeding stock for the home herd is of more importance than judging stock according to show ring classification, knowing the history of breeds of livestock, and principal livestock producing states. The ability to recognize and treat diseases of animals is found in the first group but some of the specific veterinary jobs are listed in Group II by the wheat farmers.

These men consider the conservation jobs of slightly more importance than does the entire group. They are especially interested in the planting of shelter belts, developing basic soil and water conservation plans for a farm and laying out of fields for strip farming.

This class of farmers believe that all the farm management skills and abilities are of first importance--none of the jobs being placed in Group II or III.

In crops, selecting of proper varieties, keeping up soil fertility, and identification and control of insects are ranked at the top by this group of farmers. They also consider machinery adjustment and the control of weeds of importance. These farmers do not consider the teaching of history of grain varieties, or how flour is made as essential in a vocational agriculture course.

#### ADDITIONAL COMMENTS MADE BY FARMERS ANSWERING THE QUESTIONNAIRE

At the end of the questionnaire space was left for the men answering it to add any other jobs they thought should be included. It is of interest to note the answers made to this request.

Sixty-nine of the men had additional jobs or attitudes that they thought should be taught. These are listed below. Figures in parenthesis represent the number of times the item was mentioned.

1. Pay bills on time.
2. Do not overspend budget.
3. Stay out of debt.
4. Don't be lazy about work.
5. How to get along with what you have.
6. Community leadership and working together.
7. Selection of tools for farm shop.
8. Construction of farm buildings (5)
9. How to use and care for farm tools (4)
10. Forge work
11. Welding (gas and electric)
12. Care of machinery and equipment (12)
13. Time, rate, and depth of seeding.
14. As much practical experience as possible.
15. Effect of too much water on crops and soils.
16. Practical electricity.
17. Chemical analysis of soil.
18. Shoe repairing.
19. Cooking.
20. Tariff in industry and agriculture.
21. Economics of farm cooperatives.
22. Teach against gambling in farm products.
23. Store hay in loft (2).

It will be noted that they mention paying bills on time, not overspending budgets, staying out of debt, how to get along with what you have, community leadership and working together as of value in a farmer-training program. These phases of training are developed in the Future Farmers of America organization which is associated with the vocational agriculture departments of the high schools.

The other additions are similar to the jobs found in the questionnaire and show further the type of instruction these men consider important in a vocational agriculture course of study.

Summary of Farmer Opinions Obtained In This Study

1. The fathers of the boys in vocational agriculture departments want their sons taught the practical farm jobs and skills. These farmers believe that students should be given practice in such skills as castrating, butchering, or curing pork, vaccinating, grading market livestock, dehorning, adjustment and operation of farm machinery, identification of potato diseases, grading crops, making and applying sprays, preparation and loading of a car, planning a crop and livestock system for a farm, planning a labor schedule, making a financial budget, use of credit and keeping financial and production records of a farm.

2. Many of the informational and non-functioning topics now generally taught are not as important in the farmer opinions secured as the more practical farm jobs. For example, the Botany of plant life, history of grain varieties and breeds of livestock rank below such jobs as are listed in the preceding paragraph.

3. The opinions of farmers in dry land wheat areas differ very little from those of farmers in a diversified area. There is more favorable opinion for teaching developing basic soil and water conservation plans for a farm, laying out fields for strip farming, for agricultural conservation regulations, and the operation and adjustment of farm machinery in wheat producing areas. However, the livestock jobs are considered important by this group.

4. The majority of the farmers queried operate diversified farms. There is strong agreement among them as to the skills which are needed. Apparently

there is strong uniformity as to the farming skills needed regardless of the section of the state in which they farm.

### Summary and Conclusions

The program in vocational agriculture has shown improvement in the past fifteen years. The changes have been in the direction of a training program based more upon concrete, local and individual farm studies; toward more practical instruction in farming skills; toward a four year high school program; toward more character training through the Future Farmers of America; and toward a more continuous instruction after high school to assist the farm boy to establish himself in farming. An ideal program as set forth by this writer will improve still further the all day teaching program and the follow-up instruction after high school.

The problem of follow-up program. Several improvements and aids are suggested or reported in solving the problem of obtaining a good follow-up program which will establish young men in farming. Through supervisory visits to local instructors on the job, the writer has helped them to plan and teach part-time classes. A summer course on adult education has been taught to seventeen of the instructors. Teaching aids and plans have been prepared and made available. More participation by undergraduate trainees has been secured by helping them to organize and teach part-time and adult classes of farmers.

Further improvement is possible by continuing these activities. Some recommendations which appear to be sound are:

1. Provide more adequate and continuous participation for undergraduate

trainees in organizing and teaching part-time classes. This may be done by starting the classes early in the autumn of the senior year and continuing them through until graduation.

2. Provide more teaching helps and aids to teachers of part-time classes. The teacher trainers and supervisors should gather reference material, make outlines of courses of study, and prepare lesson plans, and distribute these to the local teachers.

The problem of securing a more effective teaching program. Present teaching programs contain a varying amount of non-functioning subject matter, if farmer and teacher opinions are assumed to be valid. The introduction of more farm problems and skills is important. These practical jobs are found to be fairly universal in all farming regions of the state, making it desirable to use the results of the studies reported here to develop a more uniform course of study than has previously been thought feasible.

Teachers do not generally know how to do enough of the basic skills which they should teach, according to the survey of teachers' abilities. Changes in the teacher training program appear to be necessary to equip teachers to carry on an ideal program. Recommendations based on the facts and studies reported here are given below.

1. A course of study for a local department of Vocational Agriculture should include the jobs found in Group I and probably some other skill jobs of similar nature that are practiced in the community. Should this program prove too limited, jobs in Group II may be used to supplement the first group. The type of farming found in the community and on the boys' farms should govern the selection of skills to be taught. For example, in a dairy community, housing and sanitation skills should be taught even though these skills are not found in Group I.

The time element will be a factor for each agriculture teacher to consider in choosing the skills he will teach in his community if he is to teach the skills the farmer considers important. If at present he is teaching jobs or skills which are classed Group III he should drop them from his course so that there will be time to teach the skills found in Group I.

Many of the jobs listed in Group II may be taught on an individual basis depending on the type of farming found in the community or the needs of the individual boy. As an example, a person would hardly be justified in teaching the whole class how to fit stock for the ring if only two or three boys are showing stock.

2. It is imperative that the agriculture teachers know how to do the skill before we can expect them to go out and teach it to a group of boys.

It has been shown that the agriculture teacher on graduation from college is unable to do many of the common farm skills. Men who have taught three years or more have "picked up" many of the skills but they are still, on the whole, quite weak in this respect.

In addition to the related sciences, a graduate of an agricultural college receives much valuable instruction on the principles and theories of farm enterprise management. For those who intend to teach Vocational Agriculture, the colleges should provide the opportunity to learn the farm skills before graduation. There would then be less time lag before these men were able to do and teach the jobs which the farmers in their respective communities expect of them.

For the men in service at the present time, it is recommended that short, intensive skill courses be made available. These courses could be

arranged by calling the men into the agricultural college or by having specialists from the college meet with groups of teachers in different parts of the state.

3. It is recommended that a state-wide course of study be developed that will include the farm skills commonly practiced in Montana. This was not thought feasible in the past because of the varied type of farming found in the state. Since farmers from the different types of farms were so closely allied in their opinions about the relative value of the skills listed, it, therefore, appears that such a course of study would be of benefit to the vocational agriculture program in the state.

The course of study could be developed along lines shown in the following example for the dairy enterprise:

#### Dairy Cattle

##### Managerial Abilities

Planning for building and Equipment

Selection of stock

Herd Improvement

Growing out dairy calves

Feeding dairy cows

Winter feeding

Pasture and pasture grasses

##### Skills to be taught

1. Remodeling barn
2. Remodeling milk house
3. Build breeding pen

1. Select bulls
2. Select females
3. Identify common breeds

1. Test milk for butter-fat
2. Keep and interpret production records

1. Dehorn with caustic
2. Vealing bull calves
3. Castrate bull calves
4. Treat scours

1. Use of home grown feeds in a ration
2. Balance ration

Dairy Cattle (con.)

Succulent feeds  
Water  
Minerals

3. Hand mix rations
4. Make water heater

Production of clean milk

1. Cooling milk
2. Sanitation of utensils
3. Clipping udders
4. Make homemade fly spray

Marketing dairy products

1. Interpret market reports

Control and prevention of diseases

1. Care of cow and calf at calving time
2. Remove after-birth
3. Treatment for bloat
4. Treatment for milk fever
5. Vaccinate for blackleg

4. A state-wide course of study developed as described above should be submitted to administrators of schools offering vocational agriculture. This will serve to acquaint the administrator with the type of course which is needed in farmer training, and enable him to assist in implementing the program. It will also call to his attention the need for adequate laboratory time, field studies and transportation of students and teacher to the farms where studies are to be undertaken.

5. It is recommended that the supervisors and teacher trainers in agricultural education visit each local instructor and develop individually with him a teaching program, based on the state course of study and the farmer opinions obtained in this study. Special local problems may be incorporated in addition to the basic topics, with adequate time allotment for the various enterprises according to local conditions. This should result in the elimination of much non-functioning subject matter and a better teaching program than most teachers now follow.

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