

DETERMINATION OF AGRICULTURAL MECHANICS SKILLS
NEEDED BY VOCATIONAL AGRICULTURAL
GRADUATES OF WAMEGO HIGH SCHOOL
1965 THROUGH 1969

by

RONNIE HOLLANDSWORTH

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James Albracht
Major Professor

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CHAPTER I

THE PROBLEM AND DEFINITIONS OF TERMS USED

Considerable discussion by Agricultural Educators has indicated that the teachers of Vocational Agriculture must meet the needs of the students in changing times to adequately prepare workers for positions of employment today and in the future.

David S. Bushnell, Director, *Division of Adult and Vocational Research*, United States Office of Education, recently stated that, "Our responsibility as educators is to provide the student with a broad base of skills and attitudes which will carry him successfully through a lifetime of work." Mr. Bushnell went on to quote Alfred North Whitehead by saying that, "There can be no adequate technical education which is not liberal and no liberal education which is not technical; education should turn out pupils with something they know well and can do well."¹

If some of the education teachers presented to students was not of a technical nature, the student would not be a well rounded individual. The education that a student received must be liberal and technical. With this technical education background, a student then will start his life in a vocation based on this technical education. A student must be motivated to choose a career early in life so he may receive as much technical and

¹David S. Bushnell, "Curriculum Development: A Major Research Challenge" American Vocational Journal, (May, 1966), p. 25.

liberal education that is possible.

I. THE PROBLEM

Statement of the problem. The purpose of this study was (1) to determine the importance of agricultural mechanics skills the graduates perceived to be important in their present positions; and (2) to determine the agricultural mechanics skills which were meeting the needs of the students who have taken four years of vocational agriculture in the Wamego Public School system.

Vocational agriculture, based upon the findings of recent studies, was helpful to a student, whether he stayed in farming or sought employment in some other phase of agri-industry. Managers of businesses closely related to agriculture are constantly seeking high school graduates who have a farm background or the practical knowledge of farming.

Agricultural Mechanics training can prepare a student in many ways for a career in farm mechanics. After a student learned how to weld, he could recognize a good job of welding when he saw one. When a student saw how neglect of service can ruin a piece of new machinery, he was better motivated to learn farm power maintenance. After graduation, these experiences may lead directly to a job as a welder or employment by an implement dealer as a mechanic or a parts salesman because of his interest and ability in agricultural mechanics.²

²Norman K. Hoover, Handbook of Agricultural Occupations (Danville: The Interstate Printers and Publishers, Inc., 1963), p. 20.

IMPORTANCE OF THE STUDY

In order for a graduate to be employable, he must be proficient in the skills that are marketable in his home area. The purpose of this study was to determine whether or not the vocational agriculture graduates were receiving the proper training toward obtaining a marketable skill. This skill may be considered marketable in the form of doing work on the farm for themselves or the selling of labor to an agriculture related employer. The vocational agriculture teacher should ask himself these questions: Do these skills meet the needs of the employer? Should more skills be integrated to make a more marketable product? Should less skills be taught and more emphasis placed upon the skills that are being taught? If so, what skills meet the demands placed upon these graduates? Were changes taking place which necessitated a complete revamping of agricultural mechanics skills? Do the skills which were taught five years or more meet the demands of the employer today? What other specific training was necessary for farm or non-farm agricultural related employment?

These questions, when answered, would aid the author in developing a meaningful list of agricultural mechanics skills to better qualify graduating vocational agriculture students for employment. The results of the study will serve as a guide in integrating marketable skills into a more rounded agriculture mechanics curriculum.

II. DEFINITIONS OF TERMS USED

Vocational Agriculture Student: Any student who was regularly enrolled in all day classes of vocational agriculture.

Agricultural Mechanics: An agriculture mechanics program includes all

the unspecialized mechanical activities that a progressive farmer or other agricultural worker would perform with the kinds of tools and equipment he will have accessible.³

Graduate: Any student who has successfully completed all the vocational agriculture courses that are offered in Wamego High School.

Very Useful: Essential to be successful in your occupation, or used very frequently, or used seldom but very important when used.

Useful: Important but not essential for success in your occupation, may or may not be frequently used.

Little or No Use: Helpful but not essential to be successful in your occupation, seldom used or frequently used but could be learned on the job.

Agricultural Related: Jobs closely associated with farming.

Farming: Graduates who were self employed in the business of operating a farm; owned or rented.

Non-Farming: Graduates who were employed by someone else or a firm in an agricultural related job.

III. LIMITATIONS

The study had the following limitations:

1. The ability of the vocational agriculture graduates to respond, accurately, to the questions as intended by the author.
2. The ability of the researcher to interpret the answers of the vocational agriculture graduates as intended by them.

³Lloyd J. Phipps, Handbook on Agricultural Education in Public Schools (Danville: The Interstate Printers and Publishers, Inc., 1965), p. 529.

3. The study was limited to the twenty vocational agriculture graduates who lived within a twenty-five mile radius of Wamego.

CHAPTER II

REVIEW OF THE LITERATURE

The literature reviewed in this report was selected after a survey was made of various materials, including bulletins, pamphlets, magazines, master's reports, doctoral dissertations, textbooks and other published and unpublished material.

The research in this report dealt with the agricultural mechanics skills that were taught in high schools. Phipps stated that:

The instruction in agriculture mechanics is an integral part of the program in agriculture education. It provides for the development of many mechanical abilities essential for success in agriculture and family living.¹

The importance of agricultural mechanics and the degree of specialization is stated by Jones as follows:

With the increased mechanization of farms, it has become necessary for the successful farmer to be proficient in the use, repair, and maintenance of mechanical equipment of various kinds. Although some farmers are expert mechanics, the majority of them need to be only general mechanics, not experts.²

This does not mean that all vocational agriculture students who participated in agricultural mechanics were able to return to the farm. Ralph Woodin brought to light that today an increasing number of students do not

¹Lloyd J. Phipps, Handbook on Agricultural Education in Public Schools (Danville: The Interstate Printers and Publishers, Inc., 1965), p. 532.

²Mack M. Jones, Shopwork on the Farm (New York: McGraw-Hill Book Company, Inc., 1955), p. 1.

have farm backgrounds; they just happen to be interested in agriculture.³

The student who is not able to return to the farm must receive equal opportunities to become proficient at a skill that will enable him to earn a living. This student needs to become proficient at a skill equally as well as a student with a sow and litter needs to become able to properly manage his swine enterprise.

Daniel Taylor, Vocational Agriculture Instructor at Cooper Rural School, Lubbock, Texas, wrote a report concerned with "Instruction in Farm Power and Machinery." Mr. Taylor stressed that as agriculture became more mechanized, there was an increased need for trained young men to enter the mechanical field of agriculture. Vocational agriculture programs had lagged behind in offering training for these ever-pressing job opportunities. Pre-employment laboratory training in farm power and machinery was one of the new programs offered in vocational agriculture in Texas as a result of the National Vocational Education Act of 1963.⁴

The teachers' overall goal was to develop understanding of basic principles involved as well as judgment and ability in the areas taught. These areas according to Phipps are:

1. Farm Shop Work. Selection, sharpening, care and correct use of shop tools and equipment; woodwork and simple carpentry; sheet metal work; elementary forge work; electric arc and oxyacetylene welding; pipe fitting; simple plumbing repairs; rope work.

³Ralph J. Woodin, "Occupational Experiences in Agricultural Education" American Vocational Journal (September, 1967), p. 26.

⁴Daniel Taylor, "Instruction in Farm Power and Machinery," Agricultural Education Magazine (January, 1971), p. 180.

2. Farm Power and Machinery. Selection, management, adjustment, operation, maintenance and repair (excluding major repairs, requiring specialized equipment and services) of farm gas engines, tractors, trucks and the principal farm machines.
3. Farm Buildings and Conveniences. Elementary scale drawing and plan reading; farmstead layout; functional requirements of farm houses, shelters, and storages; water systems; septic tanks and sewage disposal; heating.
4. Soil and Water Management. Elementary leveling, land measurement and farm mapping; farm drainage; farm irrigation; terracing, contour farming, and strip cropping (emphasis on various phases to be varied in accordance with local or regional needs).
5. Rural Electrification. Utilization of electricity in the home and in the productive farm enterprises; selection, installation, operation and maintenance of electrical equipment.⁵

Hoover, in his Handbook of Agricultural Occupations, brought to light how important planning is to a student by stating, that through a well planned project in farm mechanics, a student may gain valuable knowledge in almost any area of farm mechanization. A tractor maintenance project should make students thoroughly familiar with the functioning of a tractor, thus preparing them for the job of a farm machinery mechanic. Welding projects undertaken in the construction and repair of farm machinery can prepare graduates to operate their own welding shop or to work as a welder in a farm machinery repair shop. The portable hog house built by students as a farm mechanics project should teach them some of the basic principles of building construction, regardless of the size of the building. Abilities developed in arranging and storing parts and tools where they can be found easily may be just the skills a local farm machinery dealer is looking for in a parts

⁵Lloyd J. Phipps and others, Farm Mechanics Text and Handbook (Danville: The Interstate Printers and Publishers, Inc., 1959), p. 14.

department manager.⁶

Wiley B. Lewis, graduate student and Ralph J. Woodin, Professor of Education at Ohio State University, wrote a report concerned with the "Agricultural Mechanics as Performed on Ohio Farms in Comparison with Offerings in Vocational Agriculture." The purpose of the study was to determine whether agricultural mechanics curricula in Ohio were appropriate for preparing students enrolled in high school vocational agriculture classes to perform agricultural mechanics activities. It was found that the high school instructional programs were appropriate for preparing students to perform mechanical activities found in production agricultural occupations.⁷

Further importance was placed on the curriculum development and implementation by Schultz when he said that, curriculum in agriculture can give young people the kind of background of knowledge, skill creativity, and inspiration which--when followed by experience--will raise them to positions that are the counterpart of the most important and rewarding positions in any other industrial occupation in the United States.⁸

The mechanical jobs on a modern farm are many and varied. Thousands of dollars are invested in highly mechanized machinery and equipment that must

⁶Norman K. Hoover, Handbook of Agricultural Occupations (Danville: The Interstate Printers and Publishers, Inc., 1963), p. 23.

⁷Wiley B. Lewis and Ralph J. Woodin, "Agricultural Mechanics as Performed on Ohio Farms in Comparison with Offerings in Vocational Agriculture," (Unpublished Graduate Study, Ohio State University, 1970)

⁸H. W. Schultz, The Yearbook of Agriculture, Protecting Our Food, United States Department of Agriculture (Washington: Government Printing Office, 1966), p. 244.

be properly maintained and kept in good operating order.

Construction, maintenance and repair work may almost all be done by a farmer; however, major overhaul of tractors, combines, balers and other highly mechanized machines is done best by experienced mechanics who are well trained by factories in the operation and upkeep of their machines.⁹

Gentry noted that, while speaking about agriculture related occupations, by careful planning, the teachers can teach in a single class many of the skills needed by students preparing for farming and those students preparing for off-farm agricultural occupations and business.¹⁰

Holt stated in his study of agricultural mechanics over a five year period, that agricultural mechanics is not only shop work, but it involves all of the practical application of engineering to agriculture. Teachers must be on the alert to present knowledge of agricultural mechanics to agricultural occupations other than farming and also to meet new demands.¹¹

Knox, in writing about today's mechanics, emphasized the importance of meeting the needs of not only the all-day student, but regardless of the status of the person enrolled in vocational agriculture, whether it be high school, young farmer, or adult or post high, the teacher of vocational agriculture must analyze the needs of the enrollees.¹²

⁹Harry O. Sampson and others, Farm Shop Skills (Chicago: American Technical Society, 1954), p. 2.

¹⁰Gene A. Gentry, "Mechanical Skills Needed for Off-Farm Agricultural Occupations," Agricultural Education Magazine, (August, 1968), p. 29

¹¹Raymond Holt, "Five Years of Agricultural Mechanics," Agricultural Education Magazine (March, 1967), p. 207.

¹²M. C. Knox, "Mechanics Instruction for Today," Agricultural Education Magazine (July, 1967), p. 14.

Holt further stated that, concerning changes, agricultural mechanics, like other areas of instruction in vocational agriculture, is undergoing significant changes to meet the occupational needs of the vocational agriculture student and graduate. To meet these student needs, we are going to constantly update programs.¹³

The related readings identified the important areas and advantages of agricultural mechanics skills. The problem of teaching for employment in farm and agriculture related occupations was covered in this review of literature. The literature addressed itself to assessing a more meaningful program of agricultural mechanics in meeting the needs in agricultural related occupations. The literature emphasized the successes that have been reported in an agricultural mechanics curriculum. Considerable literature was available and many programs have been conducted in the area of usefulness to vocational agriculture graduates. The related literature was helpful in building the instrument used in the study.

¹³Holt, loc. cit.

CHAPTER III

PROCEDURE FOR INVESTIGATION

This study was designed to determine how useful the agricultural mechanics skills were to the graduating vocational agriculture student. An effort was made to identify what skills the graduates were using and to what degree they were being used. The author also attempted to determine whether the skills being taught were in need of being updated, whether some should be deleted from the curriculum or whether more emphasis should be put on some already being taught.

A questionnaire was constructed which included 29 units and five areas of instruction in agricultural mechanics. The areas of farm shop work, farm power and machinery, farm building and conveniences, soil and water management and rural electrification. The 29 units and 5 areas were determined by reviewing the existing programs of agricultural mechanics at Wamego High School, by related readings and by suggestions from representatives of Kansas State University.

A questionnaire was constructed to compare the usefulness of the shop skills and a draft copy was tested by David Lightner, Senior agriculture education major, who was doing his student teaching at Wamego High School at that time and by senior vocational agriculture students in the Wamego High School and by Professor Bradley, Professor Stevenson and Doctor Albracht, personnel at Kansas State University. Through the aid of suggestions made by Mr. Lightner and the others, a new questionnaire was then constructed and used.

The investigation was made by contacting vocational agriculture graduates of Wamego High School and giving them an opportunity to answer questions from a selected questionnaire prepared by the author. Each graduate was given a list of agricultural mechanics skills for each area skill and told to rank the usefulness of each skill. The graduates were asked to rate skills according to his present occupation as follows: Very Useful, Essential to be successful in your occupation, or used very frequently, or used seldom but very important when used; Little or No Use, Helpful but not essential in your occupation, may or may not be frequently used; Little or No Use, Helpful but not essential to be successful in your occupation, seldom used or frequently used but could be learned on the job.

The questionnaires were mailed in July, 1970. Twenty of the twenty-three questionnaires were returned within one week. At the scheduled time, a visit was made to the remaining three. It was found that one was in the armed forces and the remaining two did not wish to participate in the study. Of the twenty graduates who lived within a 25 mile radius of Wamego, eight were farming and twelve were working in non-farm agricultural related occupations.

The responses given to each item of the questionnaire by the graduates were analyzed by assigning a weighted value to each reply. These assigned ratings were: Very useful, 5 points; Useful, 3 points; and Little or no use, 1 point. The sum for each was then divided by the number of responses. The ratings for each skill were placed in tables showing frequencies of distribution and the frequencies were computed. All skills which received a weighted average of 2.0 or above are to be considered as important in the development of a curriculum to prepare workers for employment in farm and farm related

areas. After the material was summarized and analyzed, conclusions and recommendations were made by the author.

CHAPTER IV

ANALYSIS OF FINDINGS

The findings of this study are included in this chapter to illustrate the usefulness of the shop skills which were taught to the vocational agriculture students from 1964 to 1969 at Wamego High School. The list of graduates who had vocational agriculture included 23 who lived within a 25 mile radius of Wamego High School. The responses of these 23 graduates provide the information which is presented in this chapter.

The responses of eight graduates in Table I who had vocational agriculture and were self-employed in farming, indicated a weighted average importance rating for sharpening saws of 2.5. The weighted average was determined by using a Liekert type scale with values as follows: Very useful, 5 points; Useful, 3 points; and Little or no use, 1 point. All skills which had a weighted average rating of 2.0 were considered useful and should be included in vocational agriculture curriculum. The 12 non-farming graduates were employed in farm labor or agricultural related occupations. Agricultural related means that the jobs were closely associated with farming.

The eight graduates who were farming had a weighted average score of 2.5 for sharpening saws which was considered useful and should be included in the curriculum. The non-farm group, with a weighted average of 1.4, indicated that sharpening saws had little usefulness and would not be needed in the curriculum. The total weighted average of 1.8 for the two groups indicated that sharpening saws was of little usefulness and should not be a part of the agricultural mechanics curriculum for farm and non-farm graduates.

The remaining seven skills for tool conditioning were rated between 2.0 and 3.4 and were considered to be useful and should be included in an agricultural mechanics curriculum. The overall rating of the tool conditioning unit of 2.7 indicated that this unit should be included in the curriculum. The graduates who were farming had a weighted average of 2.4 and the non-farm graduates had a weighted average score of 2.8, which indicated that this unit was useful to both groups.

Table I

THE IMPORTANCE OF TOOL CONDITIONING SKILLS IN THE PRESENT
OCCUPATIONS OF TWENTY VOCATIONAL AGRICULTURE
GRADUATES OF THE WAMEGO HIGH SCHOOL

Tool Conditioning Skills	Agricultural Employment		Total wt. avg.
	Eight Farming* wt. avg.**	Twelve Non-Farm*** wt. avg.	
Sharpening Saws	2.5	1.4	1.8
Sharpening High-Speed Drill Bits	3.3	3.2	3.2
Sharpening Screwdrivers	2.4	2.6	2.5
Use of and Conditioning the Power Grinder	2.7	2.7	2.7
Sharpening Cold Chisels	2.8	2.8	2.8
Sharpening Auger Bits	2.8	2.8	2.8
Use and Care of a File	3.0	2.8	2.9
Fitting Tool Handles	2.5	2.2	2.3
Overall Rating (Tool Conditioning) wt. avg.	2.4	2.8	2.7

*Eight graduates who were self-employed in production agriculture.

**Weighted averages were determined by a Liekert type scale which values were as follows: 5 points, very useful; 3 points, useful; and 1 point, little or no use. The sum was then divided by the number of responses.

***Twelve graduates who were working for farmers as hired hands or were working in agricultural related occupations.

As indicated in Table II, the eight farm graduates replied that all phases of welding were very useful and should be included in the agricultural mechanics curriculum. The skills of cutting, arc welding and striking an arc were rated very useful with a weighted average of 5.0 by the farm graduates.

The non-farm graduates indicated that welding should be included in the agricultural mechanics skills which are taught. Each skill in this group was rated very useful. Bronze welding in the oxyacetylene area and overhead welding in the arc skill group received a weighted average rating of 3.2, which was the lowest rating of the welding skills.

The importance of the arc welding skills, with weighted averages of 4.7 and 4.3 respectively, were rated slightly higher than the oxyacetylene skills. Both the oxyacetylene skills and the arc welding skills were given the highest importance rating of the agricultural mechanics skills.

Table II

THE IMPORTANCE OF WELDING SKILLS IN THE PRESENT OCCUPATIONS OF TWENTY
VOCATIONAL AGRICULTURE GRADUATES OF THE WAMEGO HIGH SCHOOL

Welding Skills	Agricultural Employment		
	Eight Farming wt. avg.	Twelve Non-Farm wt. avg.	Total wt. avg.
Oxyacetylene	4.7	4.0	4.3
a. Adjusting gauges and Lighting Blowpipes	4.4	3.9	4.1
b. Fusion Welding	3.6	3.5	3.6
c. Bronze Welding	4.1	3.2	3.6
d. Cutting	5.0	4.2	4.6
Arc Welding	5.0	4.2	4.7
a. Striking an arc	5.0	4.4	4.6
b. Flat Welding	4.7	4.3	4.6
c. Horizontal Welding	4.7	4.2	4.4
d. Overhead Welding	3.6	3.2	3.5
Overall Rating (Welding) wt. avg.	5.0	4.5	4.7

The replies of the farm graduates in Table III pointed out that the overall rating of cold metal skills was 3.0. The skill of drilling received a 3.6 weighted average from the farm group and a 3.2 weighted average from the non-farm group. The total weighted average for drilling was a 3.4, which indicated it should be included in the curriculum for all the Wamego vocational agriculture graduates. Riveting received a 2.1 weighted average from the farm graduates which indicated it could be included as a skill in an

agriculture mechanics curriculum since all skills which received an importance rating of 2.0 were to be considered for inclusion in the agricultural mechanics curriculum.

Table III

THE IMPORTANCE OF COLD METAL SKILLS IN THE PRESENT OCCUPATIONS
OF TWENTY VOCATIONAL AGRICULTURE GRADUATES
OF WAMEGO HIGH SCHOOL

Cold Metal	Agricultural Employment		
	Eight Farming wt. avg.	Twelve Non-Farm wt. avg.	Total wt. avg.
Hacksawing	2.3	3.3	3.0
Drilling	3.6	3.2	3.4
Cutting Threads	2.3	3.5	3.1
Riveting	2.1	2.8	2.6
Overall Rating (Cold Metal) wt. avg.	3.0	3.3	3.2

The agricultural mechanics skill of cutting threads showed the highest weighted average for the non-farm group with a rating 3.5. Hacksawing rated a weighted average of 3.3, while drilling was given a weighted average of 3.2. Riveting rated the lowest weighted average of the non-farm group with a 2.8. The weighted averages indicated that all areas should be included in an agriculture mechanics curriculum for both groups.

The responses shown in Table IV indicated that the total weighted average for hot metal was 2.7, which indicated that this area should be included in a combined class of farm and non-farm students. The skill of annealing for the total group was 1.9, or below the specified weighted average of 2.0 to

be included in a vocational agriculture curriculum.. The farming group, however, showed a weighted average of 2.4 for annealing to indicate that this skill should be included in the skills for the farm graduates.

Table IV

THE IMPORTANCE OF HOT METAL SKILLS IN THE PRESENT OCCUPATIONS
OF TWENTY VOCATIONAL AGRICULTURE GRADUATES
OF THE WAMEGO HIGH SCHOOL

Hot Metal Skills	Agricultural Employment		
	Eight Farming wt. avg.	Twelve Non-Farm wt. avg.	Total wt. avg.
Forging	1.9	2.3	2.2
Measuring Stock	1.9	2.7	2.4
Tempering	2.7	2.2	2.4
Annealing	2.4	1.7	1.9
Bending	2.7	3.8	3.4
Overall Rating (Hot Metal Skills) wt. avg.	2.4	2.8	2.7

Forging and the measuring of stock were skills not considered important in the curriculum for production agriculture because this skill had a weighted average of 1.9 by the graduates who were farming. However, forging and the measuring of stock could be included for the non-farm group as they indicated weighted average scores of 2.3 and 2.7 respectively. The total weighted average for forging was 2.2 and the skill of measuring stock was rated 2.4. Therefore, if the farm and the non-farm students are included in the same class, these skills could be justified. The non-farm group indicated annealing was not important and would not need to be included in the

vocational agriculture curriculum. This group responded that annealing had a weighted average importance rating of 1.7.

The responses in Table V illustrated that the frequency distribution of the weighted average of all carpentry skills was 3.4. The eight graduates who are farming had a weighted average of importance of 3.8 for all skills in carpentry. The carpentry skill of sawing had the highest weighted average for the farm graduates of 3.9, and selecting lumber was rated 3.8. The skill of using and selecting glues had the lowest weighted average of 2.3. The graduates in the non-farm group indicated that marking and measuring was the most important skill, having a weighted average of 3.6, and using a square followed with a weighted average of 3.4.

Table V

THE IMPORTANCE OF CARPENTRY SKILLS IN THE PRESENT OCCUPATIONS
OF TWENTY VOCATIONAL AGRICULTURE GRADUATES
OF THE WAMEGO HIGH SCHOOL

Carpentry Skills	Agricultural Employment		
	Eight Farming wt. avg.	Twelve Non-Farm wt. avg.	Total wt. avg.
Measuring and Marking	3.5	3.6	3.6
Sawing	3.9	3.0	3.3
Using a Square	3.5	3.4	3.4
Selecting Lumber	3.8	2.6	3.1
Selecting and Using Nails, Bolts, Screws and other Hardware	3.3	3.0	3.1
Glues	2.3	2.3	2.3
Rafter Cuts	3.5	2.5	3.0
Overall Rating (Carpentry) wt. avg.	3.8	3.1	3.4

According to the responses, all of the skill units should be included in an agricultural mechanics curriculum. This would apply to students whether they were planning to farm or to participate in a non-farm oriented career.

The replies in Table VI indicated that the overall importance rating of soldering had a weighted average of 3.9 for the farm group. Soldering practices and procedures also had a weighted average of 3.0 for the farm group. Tinning a copper was not rated as high, having a weighted average of 2.0.

Table VI

THE IMPORTANCE OF SOLDERING SKILLS IN THE PRESENT OCCUPATIONS
OF TWENTY VOCATIONAL AGRICULTURE GRADUATES
OF THE WAMEGO HIGH SCHOOL

Soldering Skills	Agricultural Employment		
	Eight Farming wt. avg.	Twelve Non-Farm wt. avg.	Total wt. avg.
Tinning Copper	2.0	2.5	2.3
Soldering Practices and Procedures	3.0	3.4	3.2
Overall Rating (Soldering) wt. avg.	3.0	2.8	2.9

The non-farm group indicated soldering practices and procedures to be most important with a weighted average of 2.3, while the overall rating of soldering for the non-farm group was 2.9. The responses by this group indicated all the skill units in soldering needed to be included in an agricultural mechanics curriculum.

The replies of the vocational agriculture graduates in Table VII indicated the concrete unit was more important to the non-farm group than to the farm group. The overall weighted average for concrete was 3.2 for the non-farm group and 2.5 for the farm group. The total weighted average overall rating for concrete was 2.9.

Table VII

THE IMPORTANCE OF CONCRETE SKILLS IN THE PRESENT OCCUPATIONS
OF TWENTY VOCATIONAL AGRICULTURE GRADUATES
OF THE WAMEGO HIGH SCHOOL

Concrete Skills	Agricultural Employment		
	Eight Farming wt. avg.	Twelve Non-Farm wt. avg.	Total wt. avg.
Figuring Proportions	2.9	2.8	2.8
Figuring Costs	2.9	2.5	2.7
Building Forms	2.6	2.8	2.7
Measuring Ingredients	2.7	3.0	2.9
Mixing and Pouring	2.6	2.6	2.6
Overall Rating (Concrete) wt. avg.	2.5	3.2	2.9

The non-farm group indicated that measuring ingredients had a weighted average of 3.0. Figuring proportions and building forms had a weighted average of 2.8 for the non-farm group. Mixing and pouring was rated as 2.6, while figuring costs had a weighted average of 2.5.

The graduates in the farm group had a weighted average of 2.9 for figuring proportions and figuring costs. Measuring ingredients was rated 2.7. Building forms, mixing and pouring had a weighted average of 2.6. The overall weighted average of concrete skills for the farm group was 2.5. The

weighted average for both groups indicated that concrete skills should be included in an agricultural mechanics curriculum.

The responses in Table VIII illustrated the weighted averages for machinery adjustment skills. The overall rating of machinery adjustment for the total group was 3.3. Both groups rated the adjustment of combines the highest having a combined weighted average of 3.7. Mower adjustment was indicated to have a weighted average of 3.5 and cultivators, balers and plows were given a weighted average of 3.4. Row planters, disks and harrows were given an importance rating of 3.3. The importance of sprayers were rated as 3.2 and drills as 3.1. Forage harvesters and corn pickers were indicated to have a 2.7 weighted average. All of these skills would have a place in the agricultural mechanics curriculum for the farm and non-farm groups.

The farm group indicated a weighted average of 3.3 for the overall rating of machinery adjustment. The farm group had a weighted average rating for the adjustment of combines of 4.0 and disks and harrows were shown to have a weighted average of 3.6. Plows were indicated to have a 3.5 weighted average, as were mowers and sprayers. Cultivators and balers were shown to have a weighted average of 3.3. Drills were indicated to have a weighted average of 3.2. Row planters were given a weighted average of 3.1, and corn pickers were rated 2.8. Forage harvesters adjustment was calculated to have a weighted average of 2.5. These weighted averages indicated that all of the machinery adjustment skills should be included in the vocational agriculture curriculum for those planning to farm.

The non-farm group indicated a weighted average of 3.4 for the overall rating of farm machine adjustment. The adjustment of balers, cultivators,

combines and mowers were each given a weighted average of 3.5 and plows were indicated to have a weighted average of 3.4. Disks and harrows were shown to have a weighted average of 3.2 while the adjustment of drills and sprayers were rated a 3.0. Row planters and forage harvestors were each given a weighted average of 2.8. Corn picker adjustment was given a weighted average of 2.6.

Table VIII

THE IMPORTANCE OF MACHINERY ADJUSTMENT SKILLS IN THE PRESENT
OCCUPATIONS OF TWENTY VOCATIONAL AGRICULTURE
GRADUATES OF THE WAMEGO HIGH SCHOOL

Machinery Adjustment Skills	Agricultural Employment		
	Eight Farming wt. avg.	Twelve Non-Farm wt. avg.	Total wt. avg.
Drills	3.2	3.0	3.1
Row Planters	3.1	2.8	3.3
Plows	3.5	3.4	3.4
Mowers	3.5	3.5	3.5
Corn Pickers	2.8	2.6	2.7
Sprayers	3.5	3.0	3.2
Combines	4.0	3.5	3.7
Balers	3.3	3.5	3.4
Forage Harvesters	2.5	2.8	2.7
Cultivators	3.3	3.5	3.4
Disks and Harrows	3.6	3.2	3.3
Overall Rating (Machinery Adjustment) wt. avg.	3.3	3.4	3.3

The farm machinery adjustment skills which were sampled should be included in a vocational agriculture curriculum whether it be for students who plan to farm, work in non-farm jobs or for a class of both farm and non-farm oriented students, according to the above results.

The responses indicated in Table IX expressed an overall weighted average rating for motor repair of 4.1. Tune-up had a weighted average importance of 4.1 as did plugs, points, condensor, etc. The overhaul skills had a weighted average importance rating of 3.6, indicating it to be the least useful skill in the total responses of motor repair.

Table IX

THE IMPORTANCE OF MOTOR REPAIR SKILLS IN THE PRESENT
OCCUPATIONS OF TWENTY VOCATIONAL AGRICULTURE
GRADUATES OF THE WAMEGO HIGH SCHOOL

Motor Repair Skills	Agricultural Employment		
	Eight Farming wt. avg.	Twelve Non-Farm wt. avg.	Total wt. avg.
Tune-up	4.0	4.2	4.1
a. Plugs, Points, Condensor, Etc.	4.0	4.2	4.1
Overhaul	3.8	3.4	3.6
Overall Rating (Motor Repair) wt. avg.	4.0	4.2	4.1

The eight respondents in the farm group had an overall weighted average rating of 4.0. Tune-up, plugs, points, condensor, etc. also had a weighted average of 4.0 for the farm group. The overhaul skills were rated as having a weighted average of 3.8 for the farm group.

The non-farm group responses had a weighted average of 4.2 for the

overall rating of motor repair. Tune-up, plugs, condensor, etc. also showed a weighted average of 4.2. Overhaul was rated the lowest for the non-farm group, having a weighted average of 3.4. The responses indicated by this group show that all motor repair skill units should be included in an agricultural mechanics curriculum whether for farm, non-farm or a combined group of students.

The responses for the small motors area were indicated in Table X. The overall rating for small motors gave a weighted average of 3.7. Tune-up for the total group showed a weighted average of 3.6 for the 20 responses.

The farm group showed the same weighted average for all the skill areas of small motors. Tune-up, overhaul and the overall rating of small motors had a weighted average of 3.5.

Table X

THE IMPORTANCE OF SMALL MOTOR SKILLS IN THE PRESENT OCCUPATIONS
OF TWENTY VOCATIONAL AGRICULTURE GRADUATES
OF THE WAMEGO HIGH SCHOOL

Small Motor Skills	Agricultural Employment		
	Eight Farming wt. avg.	Twelve Non-Farm wt. avg.	Total wt. avg.
Tune-up	3.5	3.8	3.7
Overhaul	3.5	3.6	3.6
Overall Rating (Small Motors) wt. avg.	3.5	3.8	3.7

The non-farm group indicated a weighted average of 3.8 for the overall small motors area. Tune-up also had a weighted average of 3.8 and overhaul showed the lowest rating of the non-farm group, having a weighted average of

3.6. All skills sampled in this area would be included in an agriculture mechanics curriculum whether the students were combined or separated.

The data in Table XI indicated that the selection of electrical materials had an overall weighted average rating for both groups of 2.9. The selection of the sizes of wire and the types of wire both had a weighted average of 2.8.

Table XI

THE IMPORTANCE OF SELECTION OF MATERIALS SKILLS IN THE PRESENT
OCCUPATIONS OF TWENTY VOCATIONAL AGRICULTURE GRADUATES
OF THE WAMEGO HIGH SCHOOL

Selection of Materials Skills	Agricultural Employment		
	Eight Farming wt. avg.	Twelve Non-Farm wt. avg.	Total wt. av.
Types of Wire	3.0	2.6	2.8
Sizes of Wire	3.0	2.6	2.8
Overall Rating (Selection of Materials) wt. avg.	3.0	2.8	2.9

The farm group had a weighted average of 3.0 for the type of wire, sizes of wire and the selection of electrical materials. The non-farm group indicated that the overall rating of the selection of materials had a weighted average of 2.8. The selection of types of wire and the sizes of wire had a weighted average of 2.6. Responses indicated that all the agricultural mechanics skills should be included in an agriculture mechanics curriculum.

Information in Table XII stated that the farm and non-farm groups had a weighted average importance rating of 3.0 for procedures of wiring. The farm group indicated that the knowledge of precautions was to be rated as 3.3. Service entrances was given a weighted average of 2.8 and carrying

capacities of wiring sized - splicing types had a weighted average of 3.0.

The non-farm group had a weighted average of 3.5 for the precautions area, and service entrance skills rated a weighted average of 2.8 with carrying capacities of wire sizes - splicing types having a weighted average of 2.2.

The combined group had a weighted average for precautions of 3.1. Service entrances had a weighted average of 2.8, and carrying capacity of wire sizes - splicing types was given a weighted average of 2.5. The data indicated that all skills pertaining to wiring should be included in an agriculture mechanics curriculum.

Table XII

THE IMPORTANCE OF PROCEDURES OF WIRING SKILLS IN THE PRESENT
OCCUPATIONS OF TWENTY VOCATIONAL AGRICULTURE GRADUATES
OF THE WAMEGO HIGH SCHOOL

Procedures of Wiring Skills	Agricultural Employment		
	Eight Farming wt. avg.	Twelve Non-Farm wt. avg.	Total wt. avg.
Carrying Capacity of Wire sizes - Splicing Types	3.0	2.2	2.5
Service Entrances	2.8	2.8	2.8
Precautions	3.3	3.5	3.1
Overall Rating (Procedures of Wiring) wt. avg.	3.0	3.0	3.0

Replies in Table XIII disclosed a weighted average of the respondents to the unit on following National Codes as 2.3 for the farm and non-farm group. The combined group had a weighted average of 2.3. This indicated that the area was important and should be included in an agriculture

mechanics curriculum for farm and non-farm students.

Table XIII

THE IMPORTANCE OF INSTALLATION SKILLS IN THE PRESENT
OCCUPATIONS OF TWENTY VOCATIONAL AGRICULTURE
GRADUATES OF THE WAMEGO HIGH SCHOOL

Installation Skills	Agricultural Employment		
	Eight Farming wt. avg.	Twelve Non-Farm wt. avg.	Total wt. avg.
Following National Codes	2.3	2.3	2.3

Responses in Table XIV indicated that the weighted average for the combined groups was 3.4 for repairing light cords, repairing broken wire and the combined rating for electric maintenance. The weighted average for the farm group was 3.3, while the non-farm group indicated a 3.6 weighted average importance for all maintenance areas. The responses indicated by this study that all skills in the maintenance area would be included in an agricultural mechanics curriculum for both farm and non-farm students.

Table XIV

THE IMPORTANCE OF MAINTENANCE SKILLS IN THE PRESENT
OCCUPATIONS OF TWENTY VOCATIONAL AGRICULTURE
GRADUATES OF THE WAMEGO HIGH SCHOOL

Maintenance Skills	Agricultural Employment		
	Eight Farming wt. avg.	Twelve Non-Farm wt. avg.	Total wt. avg.
Repairing Light Cords	3.3	3.6	3.4
Repairing Broken Wires	3.3	3.6	3.4
Overall Rating (Maintenance) wt. avg.	3.3	3.6	3.4

Replies in Table XV gave the total weighted average for electric motors as 3.2 and maintaining motors as 3.3. The total group indicated a 3.2 weighted average for types of electric motors. The sizes of electric motors was given a weighted average rating of 3.1.

The farm group indicated an overall weighted average of 3.5. Types and maintaining electric motors were rated at 3.0. Sizes were given a 2.8 weighted average by the farm group.

The non-farm group rated electric motors 4.3 overall. Maintaining electric motors was given a 3.5 weighted average. The non-farm group had a weighted average of 3.4 for sizes and types of electric motors. The responses by the graduates indicate that all of the motors skills should be included in an agriculture mechanics curriculum.

Table XV

THE IMPORTANCE OF MOTORS SKILLS IN THE PRESENT OCCUPATIONS
OF TWENTY VOCATIONAL AGRICULTURE GRADUATES
OF THE WAMEGO HIGH SCHOOL

Motors Skills	Agricultural Employment		
	Eight Farming wt. avg.	Twelve Non-Farm wt. avg.	Total wt. avg.
Sizes	2.8	3.4	3.1
Types	3.0	3.4	3.2
Maintaining	3.0	3.5	3.3
Overall Rating (Motors) wt. avg.	3.5	4.3	3.3

Information in Table XVI pointed out the weighted average for the responses for the importance of drawing. The non-farm group indicated that the overall rating for drawing had a weighted average of 3.9. Projects,

sketching and to scale were all given a weighted average rating of 3.8 by the non-farm group. Blueprint reading was given a weighted average of 3.0.

The farm group indicated an overall weighted average rating of 3.2 for drawing. Projects, sketching and to scale were all rated 3.1, and blueprint reading was rated as 3.0. The total group indicated an overall weighted average of 3.2. Projects, sketching and to scale were all given a 3.1 rating while blueprint reading indicated a weighted average of 3.0. This indicated that all skill areas in drawing would be included in the agriculture mechanics curriculum.

Table XVI

THE IMPORTANCE OF DRAWING SKILLS IN THE PRESENT OCCUPATIONS
OF TWENTY VOCATIONAL AGRICULTURE GRADUATES
OF THE WAMEGO HIGH SCHOOL

Drawing Skills	Agricultural Employment		
	Eight Farming wt. avg.	Twelve Non-Farm wt. avg.	Total wt. avg.
Projects	2.8	3.8	3.1
Sketching	2.8	3.8	3.1
To Scale	3.8	3.8	3.1
Blueprint Reading	3.0	3.0	3.0
Overall Rating (Drawing) wt. avg.	3.0	3.9	3.2

The responses for farmstead layout area were given in Table XVII. The overall group rating indicated a weighted average of 2.4. Building locations were indicated to have the highest weighted average of 3.8 for all groups. Feedlot planning was rated 2.3 weighted average.

The farm group indicated building locations and farmstead layout overall to have a weighted average of 3.8 and feedlot planning was given a weighted average of 3.0. The non-farm group indicated a weighted average rating of 3.8 for building locations and the skill of feedlot planning was given a weighted average rating of 2.0. However, the twelve non-farm graduates indicated the overall rating of farmstead layout to have a weighted average of 1.9. This would indicate that it should not be included in an agricultural mechanics curriculum as it had a weighted average of less than 2.0. All of the other skills in farmstead layout should be included in an agricultural mechanics curriculum, whether the students were separated or in a combined class.

Table XVII

THE IMPORTANCE OF FARMSTEAD LAYOUT SKILLS IN THE PRESENT OCCUPATIONS
OF TWENTY VOCATIONAL AGRICULTURE GRADUATES
OF THE WAMEGO HIGH SCHOOL

Farmstead Layout Skills	Agricultural Employment		
	Eight Farming wt. avg.	Twelve Non-Farm wt. avg.	Total wt. avg.
Feedlot Planning	3.0	2.0	2.3
Building Locations	3.8	3.8	3.8
Overall Rating (Farmstead Layout) wt. avg.	3.8	1.9	2.4

Data in Table XVIII indicated the responses for the importance of farm buildings requirements in the agricultural mechanics curriculum. The farm group indicated roofings to have a weighted average of 3.3. Types of farm buildings were given a weighted average of 3.0. The framing unit was

indicated to have a weighted average of 2.1. The overall rating for farm buildings requirements were given a 2.8 weighted average. Bracing and the layout of buildings were given a weighted average of 2.8 and foundations were rated at 2.5.

The non-farm group indicated a weighted average for the requirements of farm buildings to be 3.0. Roofings and foundations were given a weighted average of 3.2. The bracing unit was indicated to have a weighted average of 3.0. The types of farm buildings was rated 2.0 and framing was given a weighted average of 1.8. The last two would be of little importance to a group of students planning for non-farm occupations as indicated by this group.

Table XVIII

THE IMPORTANCE OF REQUIREMENTS OF FARM BUILDINGS IN THE
PRESENT OCCUPATIONS OF TWENTY VOCATIONAL AGRICULTURE
GRADUATES OF THE WAMEGO HIGH SCHOOL

Requirements of Farm Buildings Skills	Agricultural Employment		
	Eight Farming wt. avg.	Twelve Non-Farm wt. avg.	Total wt. avg.
Foundations	2.5	3.2	2.9
Framing	2.1	1.8	2.8
Bracing	2.8	3.0	2.9
Types	3.0	2.0	2.5
Layout of Buildings	2.8	2.6	2.7
Roofings	3.3	3.2	3.2
Overall Rating (Requirements of Farm Buildings) wt. avg.	2.8	3.0	2.9

The combined groups rated the overall requirements of farm buildings as 2.9. The roofing of farm buildings had a weighted average of 3.2. Bracing and foundations of farm buildings were given a weighted average of 2.9. Framing was indicated to have a weighted average of 2.8. The layout area was indicated to have a weighted average of 2.7. The types of farm buildings was given the lowest weighted average by the total group, having a 2.5 rating. This study would indicate that all of the areas should be included in a group of both non-farm and farm bound students according to the total weighted averages.

The responses of the farm and non-farm graduates in Table XIX to the importance of the water system was given a weighted average rating of 2.4. Water system requirements responses were indicated to have a weighted average of 2.3. The sizes of pumps were given a weighted average of 2.1.

The non-farm group indicated the overall rating of water systems to have a weighted average of 1.9. Pump sizes and requirements of water systems were given a 1.8 weighted average rating. These responses indicated that the study of water systems would be deleted in an agricultural mechanics curriculum as they were indicated to have a weighted average below the 2.0 level. The farm group had a weighted average of 2.8 for the overall rating for water systems requirements. Pump sizes were indicated to have a weighted average of 2.5. This study indicated that all water systems skills should be taught to a class of farm students or a combined class of farm and non-farm students. The non-farm group indicated that water systems skills were not important and should be deleted from a class of non-farm oriented students.

Table XIX

THE IMPORTANCE OF WATER SYSTEMS SKILLS IN THE PRESENT OCCUPATIONS
OF TWENTY VOCATIONAL AGRICULTURE GRADUATES
OF THE WAMEGO HIGH SCHOOL

Water Systems Skills	Agricultural Employment		
	Eight Farming wt. avg.	Twelve Non-Farm wt. avg.	Total wt. avg.
Requirements	2.8	1.8	2.2
Pump Sizes	2.5	1.8	2.1
Overall Rating (Water Systems) wt. avg.	2.8	1.9	2.4

Information in Table XX showed that sewage disposal and septic tanks were given a total weighted average of 1.2. The farm group indicated a 1.3 weighted average and the non-farm group rating was 1.0. The results of this survey would indicate that the teaching of sewage disposal and septic tanks would not fit into a vocational agriculture curriculum at Wamego High School.

Table XX

THE IMPORTANCE OF SEWAGE DISPOSAL AND SEPTIC TANKS SKILLS IN THE
PRESENT OCCUPATIONS OF TWENTY VOCATIONAL AGRICULTURE GRADUATES
OF THE WAMEGO HIGH SCHOOL

Sewage Disposal and Septic Tanks Skills	Agricultural Employment		
	Eight Farming wt. avg.	Twelve Non-Farm wt. avg.	Total wt. avg.
Septic Tank Construction	1.3	1.0	1.2

Replies in Table XXI noted the weighted average for the area of heating. The systems of heating was indicated to have a weighted average of 2.1. The

sum average for heating systems and the area of home heating was given a weighted average of 2.0. This would indicate, according to this group, that the last two areas would have questionable value in a curriculum for both groups.

The non-farm group indicated all areas to be of questionable value, according to the findings of this study. The systems area and the home area were both given a weighted average of 2.0. The overall rating of heating was indicated to have a weighted average of 1.8.

Table XXI

THE IMPORTANCE OF HEATING SKILLS IN THE PRESENT OCCUPATIONS
OF TWENTY VOCATIONAL AGRICULTURE GRADUATES
OF THE WAMEGO HIGH SCHOOL

Heating Skills	Agricultural Employment		
	Eight Farming wt. avg.	Twelve Non-Farm wt. avg.	Total wt. avg.
Systems	2.3	2.0	2.1
Home	2.0	2.0	2.0
Overall Rating (Heating) wt. avg.	1.9	1.8	1.9

The farm group indicated the heating systems and the overall rating of heating had a sum average of 1.9. The systems area was given a weighted average of 2.3. The home heating responses were given a weighted average of 2.0. This would indicate that the home heating area would be questionable in a vocational agriculture curriculum, according to this group.

Elementary leveling procedures are shown in Table XXII. They were given a weighted average of 2.5 for the farm group and a weighted average of 2.6 for the non-farm group. The combined groups rated the overall

Elementary leveling procedures at 2.6. Elementary leveling procedures, especially as it pertains to a topographic map, serves a useful purpose in the agricultural mechanics curriculum for both farm and non-farm students.

Table XXII

THE IMPORTANCE OF ELEMENTARY LEVELING PROCEDURES SKILLS IN THE
PRESENT OCCUPATIONS OF TWENTY VOCATIONAL AGRICULTURE
GRADUATES OF WAMEGO HIGH SCHOOL

Elementary Leveling Procedures Skills	Agricultural Employment		
	Eight Farming wt. avg.	Twelve Non-Farm wt. avg.	Total wt. avg.
Topographic Map	2.5	2.6	2.6

Replies in Table XXIII denotes the weighted average for staking drainage lines. The farm group indicated a weighted average of 3.3. The non-farm group had a weighted average of 2.4. The sum average for the combined groups was 2.8. The results of this study indicate that farm drainage skills should be included in the agricultural mechanics curriculum.

Table XXIII

THE IMPORTANCE OF FARM DRAINAGE SKILLS IN THE PRESENT OCCUPATIONS
OF TWENTY VOCATIONAL AGRICULTURE GRADUATES
OF THE WAMEGO HIGH SCHOOL

Farm Drainage Skills	Agricultural Employment		
	Eight Farming wt. avg.	Twelve Non-Farm wt. avg.	Total wt. avg.
Staking Drainage Lines	3.3	2.4	2.8

The irrigation responses in Table XXIV pointed out that the total group had a sum average of 2.4. The farming group had a weighted average

of 2.5 for irrigation and the non-farm group weighted average was 2.3. Although more important for farming, irrigation should be included for both farm and non-farm students.

Table XXIV

THE IMPORTANCE OF IRRIGATION SKILLS IN THE PRESENT OCCUPATIONS
OF TWENTY VOCATIONAL AGRICULTURE GRADUATES
OF THE WAMEGO HIGH SCHOOL

Irrigation Skills	Agricultural Employment		Total wt. avg.
	Eight Farming wt. avg.	Twelve Non-Farm wt. avg.	
Irrigation	2.5	2.3	2.4

Data in Table XXV illustrated the responses for the importance of terracing. The overall rating for terracing of the combined groups was 3.1. Construction methods of terracing was given a weighted average of 3.4. The use of levels and equipment had a weighted average of 3.2. Determining lines of terracing was indicated to have a weighted average of 3.0.

The farm group indicated terracing to have a sum average of 3.3. The use of levels was given a weighted average of 3.3, and determining lines was rated as 3.0. Construction methods was given a 2.8 weighted average.

Graduates in the non-farm group rated the use of levels at 3.2. Determining lines, construction methods and the overall rating of terracing was given a weighted average of 3.0. Terracing skills were considered important by both groups of students and should be included in the vocational mechanics curriculum.

Responses in Table XXVI stated the weighted average for contour farming. The combined groups had a sum average overall rating of 2.8. Purposes

and layout of contour farming was given a weighted average of 3.0.

Table XXV

THE IMPORTANCE OF TERRACING SKILLS IN THE PRESENT OCCUPATIONS
OF TWENTY VOCATIONAL AGRICULTURE GRADUATES
OF THE WAMEGO HIGH SCHOOL

Terracing Skills	Agricultural Employment		
	Eight Farming wt. avg.	Twelve Non-Farm wt. avg.	Total wt. avg.
Use of Levels and Equipment	3.3	3.2	3.2
Determining Lines	3.0	3.0	3.0
Construction Methods	2.8	3.0	3.4
Overall Rating (Terracing) wt. avg.	3.3	3.1	3.1

The graduates in the farm group had an overall rating for contour farming and purposes of contour farming of 3.0. Layout was indicated to have a weighted average of 3.3.

Table XXVI

THE IMPORTANCE OF CONTOUR FARMING SKILLS IN THE PRESENT
OCCUPATIONS OF TWENTY VOCATIONAL AGRICULTURE
GRADUATES OF THE WAMEGO HIGH SCHOOL

Contour Farming Skills	Agricultural Employment		
	Eight Farming wt. avg.	Twelve Non-Farm wt. avg.	Total wt. avg.
Purposes	3.0	3.0	3.0
Layout	3.3	2.8	3.0
Overall Rating (Contour Farming) wt. avg.	3.0	2.6	2.8

Members of the non-farm group indicated a sum average overall for contour farming of 2.6. Layout had a weighted average of 2.8. Purposes of contour farming was given a weighted average of 3.0. The results of this study indicated that a unit on contour farming was important and should be included in the agricultural mechanics curriculum.

Information in Table XXVII disclosed that the responses of the combined groups gave a weighted average of 2.8 for the pond dam check. Graduates in the farming group indicated a weighted average of 2.5 while the non-farm group had a weighted average of 3.0. The findings of this study would indicate that a pond dam check unit should be included in the agricultural mechanics curriculum.

Table XXVII

THE IMPORTANCE OF POND-DAM CHECK SKILLS IN THE PRESENT
OCCUPATIONS OF TWENTY VOCATIONAL AGRICULTURE
GRADUATES OF THE WAMEGO HIGH SCHOOL

Pond-Dam Check Skills	Agricultural Employment		
	Eight Farming wt. avg.	Twelve Non-Farm wt. avg.	Total wt. avg.
Pond-Dam Check	2.5	3.0	2.8

Table XXVIII indicated the responses of the graduates' overall rating of the agricultural mechanics skills. The farm, non-farm and total group indicated that welding was the skill that rated the highest. The groups indicated a weighted average of 5.0, 4.5 and 4.7, respectively for the two groups and the total group. The total group indicated the skills of welding, motor repair, tractor maintenance, small motors, machinery and tractor service, carpentry, electricity maintenance, electric motors, machinery

adjustment, cold metal, drawing, terracing and procedures of wiring were all given a weighted average of 3.0 or above. The skills of requirements of farm building, concrete, soldering, electric selection of materials, farm drainage, contour farming, pond-dam check, tool conditioning, hot metal and topographic map were rated 2.5 to 3.0. Farmstead layout, irrigation, water systems, and following electric codes were rated from 2.0 to 2.5. All of the above units were rated as useful for the combined groups. Heating and septic tank construction were rated below 2.0, or little or no use to the graduates.

Table XXVIII

THE IMPORTANCE OF THE AGRICULTURAL MECHANICS UNITS OF
INSTRUCTION TO THE TWENTY VOCATIONAL AGRICULTURE
GRADUATES OF WAMEGO HIGH SCHOOL

Agricultural Mechanics Units of Instruction	Importance Rating		
	Farming wt. avg.	Non-Farm wt. avg.	Total wt. avg.
Welding	5.0	4.5	4.7
Motor Repair	4.0	4.2	4.1
Tractor Maintenance	4.1	3.8	3.9
Small Motors	3.5	3.8	3.7
Machinery and Tractor Service	4.0	3.2	3.6
Carpentry	3.8	3.1	3.4
Electric Maintenance	3.3	3.6	3.4
Electric Motors	3.5	4.3	3.3
Machinery Adjustment	3.3	3.4	3.3
Cold Metal	3.0	3.3	3.2
Drawing	3.0	3.9	3.2
Terracing	3.3	3.0	3.1
Procedures of Wiring	3.0	3.0	3.1
Requirements of Farm Buildings	2.8	3.0	2.9
Concrete	2.5	3.2	2.9
Soldering	2.8	3.0	2.9
Electricity - Selection of Materials	3.0	2.8	2.9
Farm Drainage	3.3	2.4	2.8
Contour Farming	3.0	2.6	2.8
Pond-Dam Check	2.5	3.0	2.8

Table XXVIII (Continued)

Agricultural Mechanics Units of Instruction	Importance Rating		
	Farming wt. avg.	Non-Farm wt. avg.	Total wt. avg.
Tool Conditioning	2.4	2.8	2.7
Hot Metal	2.4	2.8	2.7
Topographic Map	2.5	2.6	2.6
Farmstead Layout	3.8	1.9	2.4
Irrigation	2.5	2.3	2.4
Water Systems	2.8	1.9	2.4
Electricity - Following National Codes	2.3	2.3	2.3
Heating	1.9	1.8	1.9
Septic Tank Construction	1.3	1.0	1.2

Information in Table XXIX gave the occupations of the twenty vocational agriculture graduates of Wamego High School from 1965 through 1969. Eight graduates were actively engaged in farming. Of the twelve non-farm graduates, two each were in the areas of agriculture education, machinery mechanic, produce managers and machinery operators in the area of soil conservation. The remaining four were in agronomy research, civil engineer technician, farmhand and wildlife conservation student.

Table XXIX

OCCUPATIONS OF TWENTY VOCATIONAL AGRICULTURE
GRADUATES OF WAMEGO HIGH SCHOOL
1965 THROUGH 1969

Occupation	Number
Farming	8
Agriculture Education	2
Machinery Mechanic.	2
Produce Manager	2
Machinery Operator.	2
Agronomy Research	1
Civil Engineer Technician	1
Farmhand	1
Wildlife Conservation Student	1
<hr/>	
Total	20

CHAPTER V

SUMMARY AND CONCLUSIONS

The purpose of this study was to identify the skills which were needed for planning a curriculum in agricultural mechanics for the Wamego High School. The problem was designed to provide information for the development of a curriculum which would include the skills which were considered as essential in the areas of farm and non-farm occupations.

The instrument was developed which contained five areas of agricultural mechanics, and twenty-nine skills units concerned with the usefulness of each area. Each unit contained a complete listing for vocational agricultural mechanics skills for secondary school students. The population for the study consisted of twenty vocational agriculture graduates who lived within twenty-five miles of Wamego. (The respondents consisted of eight graduates who were farming and twelve graduates who were in non-farm occupations.)

The responses of the graduates to each item on the questionnaire were analyzed by assigning a weighted value to each reply. These assigned ratings were: Very useful, 5 points; Useful, 3 points; and Little or no use, 1 point. The sum for each was then divided by the number of responses. It was the decision of the author then that the skills which received a weighted average of 2.0 or above were useful and should be included in a vocational agricultural mechanics curriculum.

The study indicated that the area of welding was the most important skill being used by the twenty graduates. The total group indicated an

overall rating of Welding to have a weighted average of 4.7. The farm group indicated a weighted average of 5.0 for the overall rating of welding. Motor repair was indicated to have a weighted average of 4.1 for the total group. Tractor maintenance and small motors were indicated to have a weighted average of 3.9 and 3.7 respectively. Machinery and tractor service responses were given a weighted average of 3.6 by the total group of graduates.

The non-farm group indicated that the areas of farmstead layout, water systems, heating and septic tank construction to have a weighted average of less than 2.0. These areas would not be included in a curriculum, if only non-farm students were the group being taught.

The farm group indicated that the skills of heating and septic tank construction were not important and would not be included in the agricultural mechanics curriculum. The total group indicated the same 27 of 29 skills to be important, as the farm group. The farm group indicated a weighted average of 1.9 for heating and 1.3 for septic tank construction. The total group responses indicated a weighted average of 1.9 for heating and 1.2 for septic tank construction. Therefore, these two areas should not be included in a vocational agricultural mechanics curriculum.

The following conclusions were reached after considering the results of this study:

1. The skills required for farming and non-farm employment were very similar.
2. Since most skills required are very similar for both farm and non-farm students, they could be taught in a combined class of students.

3. The present skills being taught meet the demands of the graduates with the exception of Heating and Septic Tank Construction.
4. The units of Heating and Septic Tank Construction were the agricultural mechanics skills which should be omitted from the high school program of instruction.
5. The process of studying agricultural mechanics skills for employment in farm and agricultural related occupations was a satisfactory method and could be used to determine usefulness in other areas of vocational agriculture.
6. The Wamego vocational agriculture graduates were using the skills that were taught during 1965 through 1969 with the exception of Heating and Septic Tank Construction.

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APPENDIX

July 1, 1970

Dear

The attached questionnaire contains a list of the agricultural mechanics skills you were taught while you attended Wamego High School.

I am gathering this data to complete the requirements for my M.S. in Education at Kansas State University. The results of your responses will be compiled and used for my Masters Report. They will also serve as a guideline in curriculum development for coming students. I know your time is valuable and that you are rushed, but without your response this study will lack validity.

Please rate your High School agricultural mechanics skills as to the usefulness of each item, in your present situation. Answer each item independently of any other item on the questionnaire.

The following suggestions should be considered when filling out the questionnaire:

Very Useful: Essential to be successful in your occupation, or used very frequently, or used seldom but very important when used.

Useful: Important but not essential for success in your occupation, may or may not be frequently used.

Little or No Use: Helpful but not essential to be successful in your occupation, seldom used or frequently used but could be learned on the job.

Example:	Very Useful	Useful	Little or No Use
1. Harness Work	()	()	(X)
2. Making a Rope Halter	()	(X)	()

Page 2

List all occupations, beginning with the latest, on the information sheet. If you are a student, answer the questionnaire and information sheet to fit your career. Please exclude military from all parts of the data.

After you complete the questionnaire, please mail it immediately to me, in the enclosed envelope. If, for some reason, you fail to mail it by July 20, 1970, I will come by and pick up the questionnaire, so please complete it at your earliest convenience.

Sincerely,

Ron Hollandsworth

RH:cjh
Enclosure

NAME _____

ADDRESS _____

OCCUPATION _____

JOB DESCRIPTION _____

YEARS IN PRESENT POSITION _____

AGE _____

YEAR GRADUATED _____

I. FARM SHOP WORK

	Very Useful	Useful	Little or No Use
A. TOOL CONDITIONING			
1. Sharpening Saws	()	()	()
2. Sharpening High-speed Drill Bits	()	()	()
3. Sharpening Screwdrivers	()	()	()
4. Use of and Conditioning a Power Grinder	()	()	()
5. Sharpening Cold Chisels	()	()	()
6. Sharpening Auger Bits	()	()	()
7. Use and Care of a File	()	()	()
8. Fitting Tool Handles	()	()	()
Overall Rating (Tool Conditioning)	()	()	()
B. WELDING			
1. Oxyacetylene	()	()	()
a. Adjusting Gauges and Lighting Blowpipes	()	()	()
b. Fusion Welding	()	()	()
c. Bronze Welding	()	()	()
d. Cutting	()	()	()
2. Arc Welding	()	()	()
a. Striking an Arc	()	()	()
b. Flat Welding	()	()	()
c. Horizontal Welding	()	()	()
d. Overhead Welding	()	()	()
Overall Rating (Welding)	()	()	()
C. COLD METAL			
1. Hacksawing	()	()	()
2. Drilling	()	()	()
3. Cutting Threads	()	()	()
4. Riveting	()	()	()
Overall Rating (Cold Metal)	()	()	()
D. HOT METAL			
1. Forging	()	()	()
2. Measuring Stock	()	()	()
3. Tempering	()	()	()
4. Annealing	()	()	()
5. Bending	()	()	()
Overall Rating (Hot Metal)	()	()	()

	Very Useful	Useful	Little or No Use
E. CARPENTRY			
1. Measuring and Marking	()	()	()
2. Sawing	()	()	()
3. Using a Square	()	()	()
4. Selecting Lumber	()	()	()
5. Selecting and Using Nails, Bolts, Screws and other Hardware	()	()	()
6. Glues	()	()	()
7. Rafter Cuts	()	()	()
Overall Rating (Carpentry)	()	()	()
F. SOLDERING			
1. Tinning Copper	()	()	()
2. Soldering Practices and Procedures	()	()	()
Overall Rating (Soldering)	()	()	()
G. CONCRETE			
1. Figuring Proportions	()	()	()
2. Figuring Costs	()	()	()
3. Building Forms	()	()	()
4. Measuring Ingredients	()	()	()
5. Mixing and Pouring	()	()	()
Overall Rating (Concrete)	()	()	()
II. FARM POWER AND MACHINERY			
A. MACHINERY ADJUSTMENT			
1. Drills	()	()	()
2. Row Planters	()	()	()
3. Plows	()	()	()
4. Mowers	()	()	()
5. Corn Pickers	()	()	()
6. Sprayers	()	()	()
7. Combines	()	()	()
8. Balers	()	()	()
9. Forage Harvesters	()	()	()
10. Cultivators	()	()	()
11. Disks and Harrows	()	()	()
Overall Rating (Machinery Adjustment)	()	()	()

	Very Useful	Useful	Little or No Use
B. TRACTOR MAINTENANCE			
1. Battery Care	()	()	()
2. Air Cleaner Service	()	()	()
3. Pack Bearings	()	()	()
4. Oil Change and Filters	()	()	()
5. Hydraulic Systems	()	()	()
6. Electrical Systems	()	()	()
a. Plugs	()	()	()
b. Points	()	()	()
c. Timing	()	()	()
d. Carburetor	()	()	()
Overall Rating (Tractor Maintenance)	()	()	()
C. MACHINERY AND TRACTOR SERVICE			
1. Daily Service Procedures	()	()	()
2. Oils and Greases	()	()	()
3. Storage of Machines	()	()	()
Overall Rating (Machinery and Tractor Service)	()	()	()
D. MOTOR REPAIR			
1. Tune-up	()	()	()
a. Plugs, Points, Condensor, Etc.	()	()	()
2. Overhaul	()	()	()
Overall Rating (Motor Repair)	()	()	()
E. SMALL MOTORS			
1. Tune-up	()	()	()
2. Overhaul	()	()	()
Overall Rating (Small Motors)	()	()	()
III. RURAL ELECTRIFICATION			
A. SELECTION OF MATERIALS			
1. Types of Wire	()	()	()
2. Sizes of Wire	()	()	()
Overall Rating (Selection of Materials)	()	()	()

	Very Useful	Useful	Little or No Use
B. PROCEDURES OF WIRING			
1. Carrying Capacity of Wire Sizes - Splicing Types	()	()	()
2. Service Entrances	()	()	()
3. Precautions	()	()	()
Overall Rating (Procedures of Wiring)	()	()	()
C. INSTALLATION			
Following National Codes	()	()	()
D. MAINTENANCE			
1. Repairing Light Cords	()	()	()
2. Repairing Broken Wires	()	()	()
Overall Rating (Maintenance)	()	()	()
E. MOTORS			
1. Sizes	()	()	()
2. Types	()	()	()
3. Maintaining	()	()	()
Overall Rating (Motors)	()	()	()
IV. FARM BUILDINGS AND CONVENIENCES			
A. DRAWING			
1. Projects	()	()	()
2. Sketching	()	()	()
3. To Scale	()	()	()
4. Blueprint Reading	()	()	()
Overall Rating (Drawing)	()	()	()
B. FARMSTEAD LAYOUT			
1. Feedlot Planning	()	()	()
2. Building Locations	()	()	()
Overall Rating (Farmstead Layout)	()	()	()

C. REQUIREMENTS OF FARM BUILDINGS	Very Useful	Useful	Little or No Use
1. Foundations	()	()	()
2. Framing	()	()	()
3. Bracing	()	()	()
4. Types	()	()	()
5. Layout of Buildings	()	()	()
6. Roofings	()	()	()
Overall Rating (Requirements of Farm Buildings)	()	()	()
D. WATER SYSTEMS			
1. Requirements	()	()	()
2. Pump Sizes	()	()	()
Overall Rating (Water Systems)	()	()	()
E. SEWAGE DISPOSAL AND SEPTIC TANKS			
Septic Tank Construction	()	()	()
F. HEATING			
1. Systems	()	()	()
2. Home	()	()	()
Overall Rating (Heating)	()	()	()
V. SOIL AND WATER MANAGEMENT			
A. ELEMENTARY LEVELING PROCEDURES			
Topographic Map	()	()	()
B. FARM DRAINAGE			
Staking Drainage Lines	()	()	()
C. IRRIGATION	()	()	()

	Very Useful	Useful	Little or No Use
D. TERRACING			
1. Use of Levels and Equipment	()	()	()
2. Determining Lines	()	()	()
3. Construction Methods	()	()	()
Overall Rating (Terracing)	()	()	()
E. CONTOUR FARMING			
1. Purposes	()	()	()
2. Layout	()	()	()
Overall Rating (Contour Farming)	()	()	()
F. POND-DAM CHECK	()	()	()

DETERMINATION OF AGRICULTURAL MECHANICS SKILLS
NEEDED BY VOCATIONAL AGRICULTURAL
GRADUATES OF WAMEGO HIGH SCHOOL
1965 THROUGH 1969

by

RONNIE HOLLANDSWORTH

B. S., Arkansas University, 1964

AN ABSTRACT OF A MASTER'S REPORT

submitted in partial fulfillment of the

requirements for the degree

MASTER OF SCIENCE

College of Education

KANSAS STATE UNIVERSITY
Manhattan, Kansas

1972

The purpose of this study was to identify the skills which were needed for planning a curriculum in agricultural mechanics for the Wamego High School. The problem was designed to provide information for the development of a curriculum which would include the skills which were considered as essential for employment in the areas of farm and non-farm occupations. Twenty vocational agriculture graduates, who lived within a twenty-five mile radius of Wamego, served as the population for this study.

The questionnaire consisted of five areas. Each area was divided into units and the units contained a complete listing of vocational agriculture mechanics skills for secondary school students. The responses given to the items in the questionnaire by the vocational agriculture graduates were analyzed by assigning a weighted value to the responses given. These assigned ratings were: Very useful, 5 points; Useful, 3 points; and Little or No Use, 1 point. The sum for each was then divided by the number of responses. All skills which received a weighted average rating of 2.0 or above are to be considered as important in the development of a curriculum to prepare workers for employment in farm and related areas. The combined respondents indicated an overall rating of 2.0 or more for 27 of the 29 skill units. The farm group indicated the same 27 units as the total group were important and should be included in the curriculum. The non-farm group indicated 25 of the 29 units had a weighted average of 2.0 or more and should be included in an agricultural mechanics curriculum. The two units which the farm group rated as important, but the non-farm group did not, were "farmstead layout" and "water systems." The "heating" and "septic tank construction" units were not considered important by either group.

The units of tool conditioning, welding, cold metal, hot metal, carpentry, soldering and concrete were considered important in the farm shop area. The units of machinery adjustment, tractor maintenance, machinery and tractor service, motor repair and small motors were considered important in the farm power and machinery area. In the rural electrification area the units of selection of materials, procedures of wiring, installation, maintenance and motors were considered important. The units of drawing, farmstead layout, requirements of farm buildings and water systems were considered important in the area of farm buildings and conveniences. The units of elementary leveling procedures, farm drainage, irrigation, terracing, contour farming and pond-dam check were considered important in the area of soil and water management.

The following conclusions were reached after reviewing the results of the study:

1. The agricultural mechanics skills required for farming and for non-farm employment were very similar.
2. Since the agricultural mechanics skills which were required were very similar for both the farm and non-farm students, they could be taught to both groups in the same class.
3. The present skills being taught meet the demands of the graduates with the exception of Heating and Septic Tank Construction.
4. The units of Heating and Septic Tank Construction were the agricultural mechanics skills which should be omitted from the high school program of instruction.

5. The process of studying agricultural mechanics skills for employment in farm and agricultural related occupations was a satisfactory method and could be used to determine usefulness in other areas of vocational agriculture.
6. The Wamego vocational agriculture graduates were using the skills that were taught during 1965 through 1969 with the exception of Heating and Septic Tank Construction.