EVALUATION AND REVISION OF A CURRICULUM FOR AGRICULTURAL CAREER AWARENESS IN OKLAHOMA

By

WILLIS OTIS JOHNSON

Bachelor of Science
Oklahoma State University
Stillwater, Oklahoma
1967

Master of Science
Oklahoma State University
Stillwater, Oklahoma
1969

Submitted to the Faculty of the Graduate College
of the Oklahoma State University
in partial fulfillment of the requirements
for the Degree of
DOCTOR OF EDUCATION
July, 1974

EVALUATION AND REVISION OF A CURRICULUM FOR

AGRICULTURAL CAREER AWARENESS IN OKLAHOMA

Thesis Approved:

Robert Terry
Thesis Adviser

Robert R. Price

James P. Key

R. N. Payne

N N Durham
Dean of the Graduate College

ACKNOWLEDGMENTS

Sincere appreciation is expressed to the many persons who were instrumental in helping make the completion of this study possible. The author wishes to express his sincere gratitude and appreciation to his committee--Dr. H. Robert Terry, Chairman; Dr. Robert R. Price, Department Head; Dr. James P. Key, thesis adviser; and Dr. Richard N. Payne--for their timely guidance during the course of this study.

Special thanks go to all who assisted with the research project--vocational agriculture teachers and the district supervisors of vocational agriculture in Oklahoma. Recognition goes to the rest of the faculty and staffs of the Agricultural Education Department and the Horticulture Department.

Acknowledgment would not be complete without an expression of appreciation to my grandparents, Mr. and Mrs. O. M. Johnson, for the encouragement they have given throughout my college career. Special recognition is extended to my wife, Dianne, for her continued support and encouragement which helped make this doctoral program and dissertation become a reality.

TABLE OF CONTENTS

LIST OF TABLES

CHAPTER I

INTRODUCTION

Programs of vocational agriculture have been an effective part of the public schools throughout the United States for more than 50 years. These programs were initiated as a result of the Smith-Hughes Act of 1917. Subsequent acts have provided federal participation and financial aid to the states. The main purpose in the beginning and for many years thereafter was limited to the development of programs for persons over 14 years of age who have entered upon or are preparing to enter upon the work of the farm or of the farm home. This direction resulted in programs that were classified as being a part of rural schools for farm boys in high school.

Due to the many sociological, technological, and scientific developments which greatly affected opportunities and training needs for persons engaged in or hoping to be engaged in agriculture, there was a shift from basic production agriculture to off-farm agricultural related occupations. The Vocational Education Act of 1963 encouraged schools to initiate programs for all students interested in any phase of agriculture. This included instructions for boys and girls in urban communities as well as in rural districts. The new programs included occupational education for those interested in ornamental horticulture, agricultural mechanics, agricultural sales and services, agricultural products and marketing, and agricultural resources and forestry, in

addition to production agriculture. These changing needs have been reflected in Oklahoma through the initiation of Vocational Agriculture Occupational Training programs (VAOT) in 42 of the 354 schools that offer vocational agriculture programs.

The purposes of vocational education in agriculture are derived from the broad setting of our democratic society, the public schools, agricultural technology, and vocational education. These purposes are as follows: (1) to contribute to the educational objectives of American public education, (2) to contribute to the controlling purposes of vocational education which is to fit persons for gainful employment, and (3) specifically to provide training and retraining for youths and adults which is realistic in pertaining to actual or anticipated opportunities for employment (28).

Baker, Dilworth, and Eddy (1) concur with the career development aspects of the purposes when they state:

> Career development is the result of relating means to ends through planned work exploration and establishment of career goals. Research findings suggest that information should be presented differently at different stages of career development. Such findings indicate also that early presentation of occupational information will facilitate understanding of occupational concepts, identification of vocational interests, realism in self-concept, appropriateness of vocational choice, and readiness to function as an effective employee.

The curricular approach to occupational choice through vocational agriculture is designed to give the students needed experiences and information to form a sounder base for their career choices.

In 1968 the National Advisory Council on Vocational Education (17) suggested the following curricular changes:

1. Occupational preparation should begin in the elementary schools with a realistic picture of the world of work. Its fundamental purposes should be to familiarize the student with his world and to provide him with the

intellectual tools and rational habits of thought to play a satisfying role in it.

2. In junior high school, economic orientation and occupational preparation should reach a more sophisticated stage with study by all students of the economic orientation and industrial system by which goods and services are produced and distributed. The objective should be exposure to the full knowledge of the relative advantages and the requirements of each.

3. Occupational preparation should become more specific in the high school though preparation should not be limited to a specific occupation. Given the uncertainties of a changing economy and limited experiences upon which vocational choices must be made, instruction should not be overly narrow but should be built around significant families of occupations or industries which promise expanding opportunities.

With these recommendations in mind it appears that there is an obligation for implementing and evaluating the effectiveness of a curriculum that has been built to help students explore all of the agricultural occupations available to them.

This project for Construction (15), Implementation (9), Evaluation, and Revision of Curriculum for Agricultural Career Awareness in Oklahoma was carried out with the support of the Agricultural Experiment Station and the Oklahoma State Department of Vocational-Technical Education. This study concentrated specifically on the Evaluation and Revision of the career awareness curriculum.

Statement of the Problem

The change in demand for employees in agricultural occupations from production agriculture to off-farm agriculture has brought into existence the need for a program to increase the awareness of vocational agriculture students to the opportunities available in agri-business. Furthermore, this array of agri-business careers has varying requisites

which require the students to become aware of their interests, abilities, and other characteristics in relation to the requirements of the occupations. Students of vocational agriculture at the present time are not properly oriented to the occupations in agriculture, to their own characteristics in relation to the occupations, or to the decision making process.

According to Kemp (13) this is thought to be especially true of less-advantaged students and of students from minority groups. She has concluded that socio-economically disadvantaged students have so far not been given the vocational education opportunities they need. Vocational programs have not been planned with them in mind, and in many cases the special needs of these young people have not been understood.

Hamilton (8) concurred in his study of youth with special needs in non-metropolitan schools in Ohio. He found that students with special needs were characterized as being educationally deprived, socially disadvantaged, and economically deprived.

Therefore, it would seem that students with special needs have no sound foundation upon which to base their choice of an occupation.

Purpose

The purpose of this study was to refine and improve a career awareness curriculum that was developed and implemented in two earlier phases of a funded research project and to appraise its effectiveness in aiding disadvantaged and minority group students in their knowledge of agricultural careers.

Objectives of the Study

The primary objectives of this study, Phase III of a larger project, were to determine if the curriculum that was constructed during Phase I and implemented during Phase II was effective in increasing the vocational agriculture student's ability to (1) identify the occupational clusters available in the broad field of agriculture; (2) locate specific occupations which might match their abilities and interests within these clusters; (3) identify specific employment requirements for these occupations; (4) identify the benefits available through employment in these occupations; (5) evaluate their own strengths and weaknesses in relation to those required by the occupations with the aid of the instructors and self-assessment instruments; (6) identify the means of securing employment in these occupations, such as cooperative work-study programs, federal and state employment services, and other personal actions to secure employment; and (7) make a tentative career development plan.

In order to fulfill the objectives of the study, a comparison must be made to determine (1) if there were differences in the accomplishments between the advantaged and disadvantaged students who were taught the career awareness curriculum and (2) if there were differences among the various ethnic groups that were taught the curriculum.

Hypotheses

In order to accomplish the above objectives, the following hypotheses were tested at the .01 level of significance:

HO_1: No significant difference will exist between the gain scores made by the advantaged and disadvantaged students when both are taught the career development curriculum.

HO_2: No significant difference will result in the gain scores of students from the various ethnic groups that are taught the career awareness curriculum.

Need for the Study

From the data amassed and reviewed during Phases I and II of this project and as denoted in a 1967 study by the Oklahoma State Research Coordinating Units (23), it can be deduced that students in Oklahoma are very unsure about their future after graduation from high school. However, it was assumed in this study that when students enroll in vocational agriculture they have an interest in an agriculturally-related occupation.

Since this curriculum for exploring careers in agriculture was the first of its kind to be developed and implemented in Oklahoma, it was imperative that it be evaluated and revised so that it might better meet its objectives.

In 1971, the National Association of State Directors of Vocational Education (18) spelled out a need for this type of study:

> . . . Career decision must be made through sensible choice rather than haphazard chance . . . and that actual preparation for entry into careers in an organized, purposeful manner is a self-evident requisit. . . . It is the position that public education from kindergarten through college must set about making arrangements of organization and instruction that will neet such needs.

These needs were also implied by Kemp (13) in her study of socio-economically handicapped youth. She concluded that we can no longer overlook the less-advantaged in our schools. However, it was also pointed out that vocational education cannot solve the problem unaided; all educators must work together to formulate programs which will help conduct the individual from childhood through adulthood.

Scope of the Study

The district supervisors of vocational agriculture from the Northeast and Southeast districts in Oklahoma were asked to identify schools from their districts with the greatest enrollment of ethnic and less-advantaged students in the Vocational Agriculture I classes. The vocational agriculture teachers from these schools were interviewed, and those who were most interested in teaching about agricultural careers were asked to teach the units. The three schools from the Northeast District and the five from the Southeast District that best met the requirements for this study were selected by the researcher to participate in the project.

The students were first grouped ethnically. They were further identified as disadvantaged if they were mentally or physically handicapped or if the parents' income was below $3,000. The students who were not economically disadvantaged or mentally or physically handicapped were listed as advantaged. This classification was carried out by the teachers in each of the schools.

There were also several factors that tended to limit the scope of the study and which should be taken into consideration before any generalizations are made about the results of the study. These limitations were as follow:

1. The study was limited to ninth grade vocational agriculture students in eight Oklahoma high schools.

2. Only six specific agricultural career units were considered in the study.

3. Implications of this study are not necessarily applicable to some vocational agriculture departments in Oklahoma due to the fact that

these were selected schools and may or may not be representative of schools within the state.

4. There is no way of measuring the variability of the teacher input at this time.

Definition of Terms

Certain terms used throughout this study had special meanings or implications. These terms and their definitions are as follow:

1. General agricultural occupation clusters -- one of the seven divisions of agriculture as defined by the United States Office of Education.

2. Specific agricultural occupation clusters -- one specific area of agriculture and agricultural instruction within one of the seven divisions of agriculture as defined by the United States Office of Education.

3. Specific agricultural occupation -- an occupation of an individual who is employed in one of the seven divisions of agriculture as defined by the United States Office of Education.

4. Less-advantaged -- the vocational agriculture student was classified as less-advantaged if he possessed one of the following characteristics: (a) parents' income below $3,000 annually or (b) the student was mentally or physically handicapped.

5. Ethnic background -- students were identified as Caucasian, Negro, or Indian.

6. Mean gain -- the average difference between pre- and post-test scores whether it is positive or negative.

CHAPTER II

REVIEW OF LITERATURE

In this review of literature the succeeding issues were considered:

1. The theoretical concepts of vocational development, career choice, and decision making.
2. The appropriate areas for occupational study in agriculture.
3. Methods of evaluating curriculum.

Theoretical Concepts of Vocational Development, Occupational Choice, and Decision Making

According to Super (24) the theory of vocational development can be summarized in a sequence of ten statements:

1. People have different abilities, interests, and personalities.
2. These characteristics qualify each person for a number of occupations.
3. Each occupation requires a certain pattern of abilities, interests, and personality traits, with tolerances wide enough to allow a variety of occupations for each person and a variety of individuals in each occupation.
4. Vocational preference and competencies, the situations in which people live and work, and hence their self concepts are fairly stable from late adolescence until maturity, making choice and adjustment a continuous process.

5. The process may be summed up in a series of life stages characterized as those of growth, exploration, establishment, maintenance, and decline; and those stages in turn may be subdivided into (a) the fantasy, tentative, and realistic phases of the exploration stage and (b) the trial and stable phases of the establishment phase.

6. The nature of the career pattern (that is, the occupational level attained, the sequence, frequency, duration of trial, and stable jobs) is determined by the individual's parental socio-economic level, mental ability, personality, and by the opportunities to which he is exposed.

7. Development through the life stages can be guided, partly by facilitating the process of maturation of abilities and interests and partly by aiding in reality testing and in the development of the self concept.

8. The process of vocational development is essentially that of developing and implementing a self concept: It is a compromise in which the self concept is a product of the interaction of inherited aptitudes, neural and endocrine make-up, opportunity to play various roles, and evaluations of the extent to which the result of role playing meets with the approval of superiors and peers.

9. The process of compromise between individual and social factors, between self concept and reality, is one of role playing, whether the role is played in fantasy, in the counseling interview, or in real life activities such as school classes, part-time work, or entry jobs.

10. Work and life satisfactions depend upon the extent to which the individual finds adequate outlets for his abilities, interests,

personality traits, and values; they depend upon his establishment in a type of work, a work situation, and a way of life in which he can play the kind of role which his growth and exploratory experiences have led him to consider appropriate.

From the preceding statements, it can be readily seen that people are different in their personalities and abilities and that the process of vocational development is basically that of creating and implementing a self concept.

In 1963 Super (26) reviewed the relationship between self concepts and various criteria of vocational development and concluded that:

1. Agreement between self concept and one's own occupational concept is related to occupational preferences and to both internal and external criteria of success and satisfaction.

2. Agreement between the self concepts and the occupational role concepts of important persons has so far tended not to be related to external criteria of success.

3. Vocational self concepts are a function of perception of the occupational role expectations of important persons, and are related to level of attainment in an occupation.

4. Agreement between self concepts and other measures of the same characteristics, that is self understanding, increase at varying rates with age in adolescence and is related to the strength of certain needs.

5. Adolescents' parent-identification (agreement between self concept of parent) are related to type of vocational interest. Identification with the like-sexed parent tends, in boys, to be related to similarity of son's to father's vocational interest in the ninth grade but not in the twelfth.

With these ideas in mind, it seems that the curriculum developed for career education at the ninth grade level should help the student accumulate information about agricultural occupations and help him in making his occupational choice. Therefore, according to Super (25):

> . . . Vocational maturity in ninth grade boys, as evaluated by intercorrelations among measures, is primarily orientation to the need to make educational and vocational choices, including acceptance of responsibility for choosing and planning an information getting approach to the orientation and choice process it is essentially, planfulness.

Since an occupation means much in an individual's life in our society, an occupational awareness curriculum seems to be the most appropriate means of presenting the various agricultural careers to the students. Hoppock (12) concurs:

> One cannot choose what one does not know, and many occupations are unknown to most of us. One may stumble into an appropriate occupation by sheer luck, but the wise choice of an occupation requires accurate information about the occupations available, what they require, and what they offer.

Venn (31) agreed with Hoppock when he said:

> The occupational life of a young person will largely be determined by the kind and level of education he receives. Students decisions are therefore crucial ones. They will, in effect, determine whether vital man power needs are to be met, whether human resources will be equal to economic potential. Further the students decision about his education will to a large extent define his future occupational role. But student knowledge of the world of work is today quite circumscribed, in-as-much as most situations are unseen and unknown to young people.

A third author, Key (14), agrees that students need help in gathering occupational information. He suggests that educators should take into account the attributes of the individual, the influences of the occupations, and the different parts of the choice-making process in setting up career awareness programs.

According to Herr (10) the decision making process in vocational development and occupational choice is perhaps the most important step to be taken by the student:

> It seems clear that although a decision may seem discrete, it is really only a step in a series of previously made decisions. It is influenced by multiple factors which include: (1) personal variables such as aptitudes, interest, sex, age,

> physical strength, and personal history; (2) social and cultural factors, which operate on an impersonal basis, including social values and other norms, job requirements, and employment opportunities; (3) interpersonal relationships received by the decision-maker; and (4) the relevance of the decision-makers reference groups.

According to Hilton (11) there are several theories on career decision-making and its relationship to vocational development. He states: "The reduction of dissonance among a person's beliefs about himself and his environments is the major motivation of career decision-making."

Hilton takes his lead from Festinger's Theory of Cognitive Dissonance (7) which shows that the magnitude of information used in decision-making is so immense that the individual often makes a choice prematurely, without fully considering the implications of the decision, in order to reduce the pressures attacking him as he sorts through the floods of information relevant to choice.

In 1972 Croft (3) discussed the use of simulation games in the decision making process:

> Games can be traced back through antiquity. They have been used for many centuries, for example, by generals in the training of armies. However, the use of games in education has been a relatively recent development.

One of the earliest supporters of games in education was John Dewey. In addition to feeling that games fulfilled a basic human need for make-believe activities, he also said, "Games provide fresh and deeper meanings to the usual activities of life" (5). He believed that the games should not be considered simply as "relief from the tedium and strain of regular school work" (4).

Farran (6) in his work with underachievers found that there was greater achievement with simulation games based upon individual

competition rather than group competition. He also found evidence that games seem to induce individual traits or skills that were not obtained through regular teaching methods, e.g., decision making.

Boocock (2) found no consistent linkage between performance in a game and academic achievement. Thus, it may be inferred that the poorest student in the class is as likely as the best student to be the winner of the game. The implication is that simulation games may be very good tools in working with disadvantaged and ethnic groups.

The use of simulation games in the classroom has been basically a phenomenon of the 1960's and is incomplete.

Appropriate Areas for Occupational Study in Agriculture

The broad field of agriculture is very diversified. Before the problem of developing a curriculum could be approached in a logical sequence it was necessary to divide agriculture into several areas which are in themselves unique but in total make up agriculture.

The United States Office of Education divided agriculture into seven areas of instruction. The Office of Education's publication Vocational Education and Occupations (29) makes the following statements:

> Agriculture is comprised of the group of related courses or units of subject matter which are organized for carrying on learning experiences concerned with preparation for or upgrading in occupations requiring knowledge and skills in agricultural subjects. The functions of agricultural production, agricultural supplies, agricultural mechanization, agricultural products (processing,), ornamental horticulture, forestry and agricultural resources, and the services related there to, are emphasized in the instruction designed to provide their competencies in agricultural occupations. An agricultural occupation may include one or any combination of these functions.

The USOE has coded each of the previously mentioned areas of instruction and a brief description of the instructional program of each is given in Vocational Education and Occupations (29).

1.01 Agriculture Production is concerned with principles and practices involved in the production of livestock and crops.

1.02 Agricultural Supplies and Services is concerned with furnishing production needs of farmers relative to specialization and combinations of manufacturing, sales, and services.

1.03 Agricultural Mechanics pertains to the sales and services of agricultural power and related equipment both on and off farm.

1.04 Agricultural Products is concerned with the assembly, grading, sorting, testing, storing, and marketing of livestock and crops.

1.05 Ornamental Horticulture is concerned with the production, distribution, and utilization of plans of ornamental value.

1.06 Agricultural Resources deals with the principles and processes in conservation and improvement of environmental resources.

1.07 Forestry pertains to the management of trees grown as a crop.

For each of these areas of instruction the occupations which are contained in each division are identified in Vocational Education and Occupations (29). The task analysis and job description for each occupation listed above were taken from the Dictionary of Occupational Titles (30).

Lark (15) followed the classification and coding system used by the United States Department of Health, Education and Welfare (29) and the United States Department of Labor (30) in selecting the appropriate areas for occupational study and curriculum development in vocational agriculture in Oklahoma.

Method of Curriculum Evaluation

In this study the purpose of the curriculum was to lead to certain desired outcomes which were stated in the form of "terminal" and "specific" objectives by Lark (15).

Pertaining to what the student needs to know about occupations, Hoppock (12) stated the following:

> The learner should know (1) employment prospects, (2) nature of work, (3) work environment, (4) qualifications, (5) unions, (6) discrimination, (7) preparation, (8) advancement, (9) earnings, (10) number and distribution of the workers, and (11) advantages and disadvantages.

In 1969 Larson (16) concluded that education and training of youth and adults for employment demands more serious consideration be given to the following:

1. Increasing use of analysis as the foundation for vocational curriculums.
2. Codifying and defining terms used.
3. Developing common understandings of effective processes of analysis.
4. Accepting of procedures found functional by other vocational services.

According to Lark (15), five basic elements should be considered when writing "terminal" and "specific" objectives for career exploration curriculum units. They are as follow:

> (1) Objectives should be clear and concise. The teacher should not be concerned with writing something beautiful and flowery. He is not producing a work that the literature critic will judge. He should be interested in writing his objectives so that anyone who is knowledgeable in the subject can read and know precisely what is meant. There should be no room for misinterpretation.
>
> (2) The objectives should be realistic and fit the grade level for which they are written. If the reader thinks this is unworthy of comment, all he needs to do is examine critically almost any published list of objectives for a unit or

> course. He will find that most sound good but there are too many and they are too difficult for the given grade level and the amount of learning time.
>
> (3) Objectives should be attainable by instruction and capable of being measured. Many teachers say they are teaching things such as honesty, leadership, and creativity, to name a few. In reality, they have done little to foster these ideas, let alone actually provided instruction to develop and measure them.
>
> (4) Specific objectives listed for a particular unit or course should be claimed only if the course develops them entirely, or more so than any other course, or to a significant degree.
>
> (5) And last of the general considerations, there should be as many objectives as are necessary or appropriate for the course or unit.

Patton (19) suggests, "Since the influence of curriculum materials is becoming more important today than ever before, any evaluation of them must be measured with their potential impact."

With the desired outcome and purpose in mind, it is now practical to decide which method of curriculum evaluation to use.

Popham (21) states:

> The most defensible criterion by which to judge the adequacy of the curriculum materials is the degree to which those materials, if used as directed, can consistently bring about desired changes in the behavior of the intended learners.

Popham (21) listed four steps in evaluating curriculum. The first step is to construct or select a set of operationally stated instructional behaviors which you expect the curriculum materials to fulfill. Secondly, pre-test the degree to which the learners can already perform the behavior of the intended objectives. The third step is to allow the learners to use the curriculum materials as directed by the developer of the materials. The fourth step involves post-testing learners to see whether or not the objectives have been accomplished.

In 1962 Taba (27) made the following comments in reference to curriculum evaluation:

> Since the curriculum is essentially a plan for helping students to learn, ultimately all evaluation goes back to the criterion of effectiveness of learning.
>
> No one doubts that evaluation serves an important role in the curriculum, teaching, and learning. The way of evaluating what is learned dictates the way in which learning takes place. The scope of evaluation determines what types or levels of learning are emphasized, no matter what the curriculum indicates. Furthermore, no matter what the teacher stresses, the student will selectively address himself to the learning on which he is examined.
>
> First evaluation must be consistent with the objectives of the curriculum.
>
> Evaluation programs should also be as comprehensive in scope as are the objectives of the school.
>
> Another important criterion of evaluation is that its results be sufficiently diagnostic to distinguish various levels of performance or mastery attained and describe the strengths and weaknesses in the processes as well as in the product performance.
>
> Finally, it should be pointed out the evaluation should be a continuous process and an integral part of curriculum development and of instruction.

Evaluation has been widely acclaimed as essential to the improvement of the instructional process. Popham and Baker (22) emphasized that the performance of the learner can accurately reflect the performance of the instructor. They support criterion-referred tests (designed to measure the objectives taught) as the most desirable gauge. Generally, student behaviors have been sampled to determine if the required behavioral change has occurred.

To date, research has appeared to justify the teaching of occupations. However, if future evidence contradicts rather than confirms the studies, many of them may have to be discounted. From the research to date, Hoppock (12) inferred that courses in occupations:

1. Increased the job satisfaction and earning power of the students who went to college.
2. Reduced unemployment among both graduates and drop outs.
3. Increased the range of occupations in which students were interested.
4. Increased the ability of students to answer questions about occupations.
5. With emphasis upon local opportunities for employment, brought occupational choices into closer harmoney with employment opportunities but failed to bring them into closer harmony with measured student abilities.
6. Courses in occupations plus individual counseling produced better results than either one alone.
7. Satisfied more high school principals than did other sources with occupational units.
8. With speakers and student visitations to the job were more effective than pamphlets and films.
9. Reduced the turnover among new employees by improving knowledge of what the job required.

Summary

The process of vocational development may be summed up in a series of life stages characterized as those of growth, exploration, establishment, maintenance, and decline. These stages may be in turn divided into (a) fantasy, tentative, and realistic phases of the exploration stage and (b) the trial and stable phases of the establishment stage. The tentative stage (between 11 and 17 years) was dealt with in this study.

Although being varied in their approaches, the occupational choice theories agree that the attributes of the individual and the influences of the occupations are joined through the matching, need satisfaction, compromise, and coping actions of the choice. It is generally agreed that the concept of career choice encompasses a sequence of compromise choices that the individual makes throughout his life.

Although the career decision may seem discrete, it is really only one step in a series of previously made decisions. Multiple factors that may influence the decision include (1) personal variables such as aptitudes, interest, age, sex, personal history, and physical strength; (2) social and cultural factors, which operate on an impersonal basis, including social values and norms, job requirements, and employment opportunities; (3) interpersonal relationships received by the decision maker; and (4) the relevance of the decision-maker's reference groups.

In developing curriculum one should consider the needs of the student, contemporary life outside the school, and the subject matter specialist. Curriculum should contain specified behaviors. These should be stated behaviorally and the student should be aware of them.

Students' decision making behavior may be enhanced via simulation games. There has been no consistent relationship between the student's academic and game performance. Thus, it would seem that the poorest student in the class is as likely as the best student to be a winner. This would imply that games would be especially valuable for the less-advantaged student.

The appropriate areas for occupational study in vocational agriculture have been identified as agricultural production, agricultural supplies/services, agricultural mechanics, agricultural products,

agricultural resources, forestry, and ornamental horticulture.

The time of implementation of the curriculum for career exploration in vocational agriculture for this study was the ninth grade level. It was assumed that when a ninth grade student enrolled in vocational agriculture he had an interest in the broad field of agriculture. The vocational maturity of ninth grade boys is primarily oriented to the need to make educational and vocational choices.

Since the influence of curriculum materials is becoming more important today than ever before, any evaluation of them must be measured with their potential impact on the learner. The most defensible criterion by which the adequacy of curriculum materials may be judged is the degree to which these materials consistently brings about the intended behavioral changes in the learner.

There are four basic steps in curriculum evaluation. The first step is to construct a set of behaviorally stated instructional objectives which the curriculum materials are expected to accomplish. Secondly, pre-test the degree to which the learner can already perform the behavior of the objectives. The third step is to permit the learner to use the curriculum as directed by the developer of the materials. The fourth step involves post-testing the learner to see whether or not the curriculum objectives were attained.

CHAPTER III

PROCEDURE AND DESIGN OF THE STUDY

The purpose of this chapter was to describe the procedures and design used in the refinement and evaluation of the agricultural career awareness curriculum.

Introduction and Background

In 1969 the United States Office of Education divided the agriculture occupational cluster into seven instructional areas. The areas as defined in the Health, Education and Welfare publication Vocational Education Occupations (29) are (1) agricultural production, (2) agricultural supplies and services, (3) agricultural products (processing), (4) agricultural mechanics, (5) ornamental horticulture, (6) forestry, and (7) agricultural resources.

In Phase I of this project Lark (15) combined forestry and agricultural resources into one instructional area due to their similarity and lack of demand data in Oklahoma. Therefore, the career exploration curriculum constructed during Phase I was oriented around the career opportunities available in the fields of (1) agricultural production, (2) agricultural supplies and services, (3) agricultural products, (4) agricultural mechanics, (5) ornamental horticulture, and (6) forestry and agricultural resources.

All of the occupations for each area of instruction in Phase I and II of the project were listed according to the Dictionary of Occupational Titles (30) job description and numbering system.

Evaluation and Revision of Curriculum

The procedures for revision and evaluation of the curriculum developed and implemented during the first two phases of this project and its effects on the vocational agriculture students were as follow:

1. Refine and improve the program based on the recommendations of the teachers and students participating in the curriculum project.
2. Select schools with sufficient numbers of students in the advantaged--less-advantaged categories and the different ethnic groups from the Vocational Education Enrollment Report in cooperation with the teachers and district supervisors of vocational agriculture.
3. Review the curriculum units with the teachers prior to teaching.
4. Pre-test students using the general test made up of selected representative questions from all units.
5. Have vocational agriculture teachers teach the units.
6. Post-test students using the general test made up of selected representative questions from all units.
7. Review units with teachers after units are taught.
8. Identify students according to advantaged-disadvantaged and ethnic groups.
9. Determine appropriate statistical technique to analyze pre- and post-test results.

Refinement of the Units

During this phase, the curriculum units were revised based on the recommendations of the teachers and students that participated in Phase II of the project. The major revisions completed were (1) lowering the reading level of all units, (2) illustrating and picture coding the instructional areas, and (3) the combining of the agricultural cluster unit to eliminate repetition and the addition of a simulation game.

Selection of Schools

The selection of schools with sufficient numbers of students in the advantaged--less-advantaged and the various ethnic groups appeared to be an essential step in this investigation. The supervisors from the Northeast and Southeast Districts were asked to supply the names of schools from their districts that had large numbers of ethnic groups and advantaged-disadvantaged students. After the schools were identified, the Vocational Education Enrollment Report for each school was surveyed; the teachers were then interviewed. The eight schools that best fit the prescribed criteria and had the most willing teachers were selected to participate in the project. The schools were as follow:

Code	School	District
01	Jay	Northeast
02	Oaks Mission	Northeast
03	Grant	Southeast
04	Idabel	Southeast
05	Hugo	Southeast
06	Ft. Towson	Southeast
07	Boley	Northeast
08	Boswell	Southeast

All of the students in the study were Vocational Agriculture I (ninth grade) students. This age level was chosen because according to Super (24):

> All this stage of development when adolescents are beginning to be called upon to make a series of pre-vocational and vocational choices they need experiences which help them to develop better self understanding and self-acceptance.

Review of Curriculum Units With Teachers

After the schools were selected, the teachers were invited to discuss the units and view the video tapes. The suggestions of the teachers were recorded and the feasible changes were made in the units. Three of the teachers could not be present, so a visit was made to their schools, and the curriculum was reviewed.

The studies conducted by Lark (15) and Henderson (9) in Phase I and Phase II of this project, respectively, indicated that the students who were taught the career development units showed a significant increase in knowledge of occupations when compared to the students in the control schools taught the conventional agricultural curriculum. Based on this information and the lack of sufficient numbers of disadvantaged and the ethnic groups in the previous phases, Phase III has worked entirely with these groups.

Teaching the Curriculum

Before the units were taught, a suggested order of activities was discussed with each teacher to help standardize their teaching. The suggested order was as follows:

1. Start the curriculum with the self-discovery unit, followed by the general unit, the agricultural cluster unit, the specific

agricultural occupation units, and then complete the series with the decision making unit and the Pay Day Game.

2. Review the unit objectives with the students.
3. Have students study information sheets and complete the assignment sheets.
4. Discuss the information sheets and the assignment sheets.
5. Show video-tapes on the occupations, take field trips, or utilize other methods of learning about occupations.
6. Discuss the occupations and the unit test.

The curriculum was taught during spring semester of the 1973-74 school year. This amount of time was allocated so that the instructors could have flexibility needed in teaching the units during the spring semester. However, all units were taught by May 15, 1974, to add uniformity to the pre-test, post-test, and the teaching schedule.

Testing Students

A schedule for testing the students was worked out with each of the individual schools. The schedule had to take into consideration the normal and extra-curricular activities in which the students would be involved during the spring semester. The pre-test was administered during the period from January 15, 1974, to January 31, 1974; and the post-test was given from April 17, 1974, to May 15, 1974.

Identification of Students According to Ethnic Groups and Advantaged--Less-Advantaged

The socio-economic and the ethnic groupings of students are thought to be significant factors in a student's achievement in school. These

two factors were identified by the vocational agriculture instructors for each of the students taking part in the study. The students were grouped as either Caucasian, Negro, or American Indian.

The students were further classified as disadvantaged if they were mentally or physically handicapped or if the parents' income was below $3,000. The students who were neither mentally or physically handicapped nor economically disadvantaged were listed as advantaged.

Statistical Analysis

In this study the revised curriculum units, the advantaged classifications, and the ethnic groupings were the independent variables. The student's gain scores on the test were the dependent variables. Analysis of variance (AOV) was used to examine all hypotheses.

Popham (20) states:

> Analysis of variance, in its most basic form, is nothing more than a clever statistical method of testing for significant differences between means of two or more groups. Typically, the performance of these groups can be considered to represent results of the treatment by an independent variable whose possible relationship to a dependent variable is being studied.
>
> . . . In essence, the method employed in the analysis of variance is to compute the variances of the separate groups being tested for mean differences. The scores of all subjects in the subgroups are then artificially combined into one total group. This is done by regrouping, for analysis purposes, all of the scores in the several groups as though they were one group. The variance of the group is approximately the same as the <u>average</u> variance of the separate subgroups, then there exist no significant difference. If, on the other hand, the average variance of the artificially combined total group is considerably larger than the average variance of the separate subgroups then a significant difference exists between two or more of the subgroups.
>
> . . . The next step in the analysis is to divide the between mean squares by the within mean squares (often called the 'error term'). The result of this division yields a value referred to as F.

Once the value of F has been obtained, the statistician may check its significance through the use of a special table of the sampling distribution of F. If the obtained F is significantly large to be statistically significant, the null hypothesis is considered untenable and the researcher concludes that the significant difference between the two means of two or more of his subgroups exists.

CHAPTER IV

PRESENTATION AND ANALYSIS OF DATA

As stated in the hypotheses, this study was concerned with differences in gain scores of advantaged, disadvantaged, and minority group students who were taught an agricultural career awareness curriculum.

Description of Schools

Eight schools with sufficient numbers of students in the advantaged, disadvantaged, and ethnic categories to facilitate statistical comparison were selected from the Southeast and Northeast Vocational Agriculture Districts of Oklahoma. The five schools chosen from the Southeast District were within a thirty-mile radius of each other, and two of the three Northeast District schools were only 20 miles apart.

None of the schools was chosen closer than 60 miles to a large metropolitan center, and all of the communities were agriculturally oriented. The types of agricultural employment opportunities available to graduates of the schools appeared to be very similar regardless of location.

Table I presents a summary of the distribution of advantaged, disadvantaged, and ethnic groups within the Vocational Agriculture I classes of each school. School I had only Caucasian and Indian students. There were 18 Caucasian students, with 10 being advantaged and 8 being disadvantaged. Of the 16 Indian students, 9 were advantaged and

TABLE I

THE DISTRIBUTION OF ADVANTAGED, DISADVANTAGED, AND ETHNIC GROUPS WITHIN THE VOCATIONAL AGRICULTURE I CLASSES OF EACH SCHOOL

	Caucasian	Black	Indian	Total
School I				
Advantaged	10	0	9	19
Disadvantaged	8	0	7	15
Total	18	0	16	34
School II				
Advantaged	0	0	0	0
Disadvantaged	0	0	14	14
Total	0	0	14	14
School III				
Advantaged	4	2	0	6
Disadvantaged	5	12	4	21
Total	9	14	4	27
School IV				
Advantaged	10	0	0	10
Disadvantaged	6	6	0	12
Total	16	6	0	22
School V				
Advantaged	10	0	0	10
Disadvantaged	4	0	0	4
Total	14	0	0	14
School VI				
Advantaged	8	0	0	8
Disadvantaged	3	5	0	8
Total	11	5	0	16
School VII				
Advantaged	0	0	0	0
Disadvantaged	0	10	0	10
Total	0	10	0	10
School VIII				
Advantaged	11	1	0	12
Disadvantaged	6	3	4	13
Total	17	4	4	25

7 were disadvantaged. School II was an all Indian school, with all 14 of the students being classified as disadvantaged. School III had a total of 27 students, with four being advantaged Caucasian, five disadvantaged Caucasian, two advantaged Black, twelve disadvantaged Black, and four disadvantaged Indian. There were 22 students in School IV, with ten being advantaged Caucasian, six disadvantaged Caucasian, and six disadvantaged Black. School V had 14 Caucasian students, with ten being advantaged and four being disadvantaged. School VI had eight advantaged Caucasian, three disadvantaged Caucasian, and five disadvantaged Black, for a total of 16. School VII had ten disadvantaged Black students. In School VIII there were 17 Caucasian students, 11 advantaged and 6 disadvantaged; 4 Black students, 1 advantaged and 3 disadvantaged; and 4 Indian students, all disadvantaged. Of the 162 Vocational Agriculture I students who participated in the study, 85 were Caucasian, 39 were Black, and 38 were Indian. Sixty-five were classified as advantaged, while 97 were classified as disadvantaged.

Analysis of Data

In Table II the mean difference between pre- and post-tests of students from all eight schools taught the agricultural career awareness curriculum is reported.

It should be noted in this table that there was an overall mean gain of 24.94 between the pre-test and post-test mean scores. This, according to the correlated T test, proved to be significant beyond the .01 level of confidence, thus indicating that the students as a group responded to the treatment and that the career exploration curriculum was effective for the group, regardless of social or ethnic classification.

TABLE II

MEAN GAIN DIFFERENCE OF SCORES BETWEEN PRE-TEST AND POST-TEST OF STUDENTS TAUGHT THE AGRICULTURAL CAREER AWARENESS CURRICULUM

	Pre-Test	Post-Test	Mean Gain
Number	162	162	
Mean Score	22.33	47.27	24.94*

*Significant beyond the .01 level.

In Table III the mean gain scores were computed for each of the socio-ethnic groupings possible in this study. It was found that there were 53 advantaged Caucasian students with a mean gain of 27.11. There were 32 disadvantaged Caucasian students with a mean gain of 25.56. This gave a total of 85 Caucasian students in the study, with a mean gain of 26.53. There were only three advantaged Blacks in the study with a mean gain of 18.33 and 36 disadvantaged Blacks with a mean gain of 23.56. Combined, the 39 Blacks had a mean gain of 23.15. There were 38 American Indians in the study, with a mean gain of 23.24. Nine Indians were advantaged and had a mean gain of 32.11, while 29 were disadvantaged, with a mean gain of 20.48. It was further illustrated in Table III that when all 65 advantaged students were grouped they had a mean gain of 27.40, compared to the 97 disadvantaged students' mean gain of 23.29. These mean gain differences, although small, may point out that social categories could possibly have a greater effect than the ethnic backgrounds of the students.

TABLE III

MEAN GAIN OF PRE-TEST AND POST-TEST SCORES OF STUDENTS TAUGHT THE AGRICULTURAL CAREER AWARENESS CURRICULUM ACCORDING TO SOCIAL AND ETHNIC CATEGORIES

	Caucasian		Black		Indian		Total	
Social Category	Number	Mean Gain	Number	Mean Gain	Number	Mean Gain	Number	Mean Gain
Advantaged	53	27.11	3	18.33	9	32.11	65	27.40
Disadvantaged	32	25.56	36	23.56	29	20.48	97	23.29
Total	85	26.53	39	23.15	38	23.24	162	24.94

It should be noted in Table III that the lack of sufficient numbers in the various categories might affect the reported mean differences. This was especially true of the advantaged Black and advantaged Indian cells. It was these differences in numbers of students which eliminated a complete statistical comparison. The mean gain for all 162 students was 24.94.

One of the most accepted methods of determining statistical differences between or among means is the analysis of variance. Popham (20 stated, "When a researcher uses the analysis of variance statistical model he is primarily interested in mean difference rather than variance difference."

By using the Statistical Analysis System (S.A.S.) and the computer, the between mean squares and within mean squares can be determined.

According to Popham (20):

> The next step in the analysis is to divide the between mean by the within mean square (often called the 'error term'). The result of this division yields a value referred to as F.
>
> Once the value of F has been obtained, the statistician may check its significance through the use of a special table of the sampling distribution of F. If the obtained F is sufficiently large to be statistically significant the null hypothesis is considered untenable and the researcher concludes that the significant difference between the two means of two or more of his subgroups exists.

In testing HO_1, test gain (advantaged students versus disadvantaged students) was used as the between mean square. Interaction (ethnic* social) was used as the within mean square or "error term." This hypothesis was tested at the .01 level of significance.

Table IV summarizes the results derived from an analysis of variance of test gain between the two social categories. The F value of 0.3079 indicates that there was not a statistically significant

difference between the test gain scores made by the advantaged and disadvantaged students. At the .01 level of significance, the analysis of variance (F value) was found to be not significant. Therefore, Hypothesis 1, that no significant difference will exist between gain scores made by the advantaged and disadvantaged students when both are taught the career exploration curriculum, must be deemed tenable and accepted.

TABLE IV

ANALYSIS OF VARIANCE FOR TEST GAIN BETWEEN ADVANTAGED AND DISADVANTAGED STUDENTS TAUGHT USING THE CURRICULUM FOR CAREER EXPLORATION

Source of Variation	Degree of Freedom	Sum of Squares	Mean Squares	F Value
Between Groups (Social)	1	113.70	113.70	0.3079*
Within Group (Ethnic*Social)	2	738.53	369.26	

Probability F*< 0.01.

THEREFORE HO_1 ACCEPTED.

In testing HO_2, test gain was compared among the ethnic groups and was used as the between mean square. Interaction (ethnic*social) was used as the within mean square. This hypothesis was also tested at the .01 level of significance.

The results derived from an analysis of variance of test gain among the ethnic groups are summarized in Table V. The F value of 0.3939 indicates that there was not a statistically significant difference in the gain scores made by the various ethnic groups at the .01 level of confidence. Therefore, Hypothesis 2, that no significant difference would result in the gain scores of students from the various ethnic groups, must be accepted.

TABLE V

ANALYSIS OF VARIANCE FOR TEST GAIN AMONG STUDENTS OF VARIOUS ETHNIC GROUPS TAUGHT USING THE CURRICULUM FOR CAREER EXPLORATION

Source of Variation	Degree of Freedom	Sum of Squares	Mean Squares	F Value
Between Groups (Ethnic)	2	290.96	145.48	0.3939*
Within Group (Ethnic*Social)	2	738.53	369.26	

Probability F* < 0.01.

THEREFORE HO_2 ACCEPTED.

CHAPTER V

SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

Summary

Background and Procedure

The purpose of this study was to refine and improve a career awareness curriculum that was developed and implemented in two earlier phases of a funded research project and to appraise its effectiveness in aiding disadvantaged and minority group students in their knowledge of agricultural careers.

The career awareness curriculum was designed and developed to increase the awareness of rural youth to their own abilities, to career opportunities in agriculture, and to the different parts of the decision making process.

To accomplish the revision and evaluation objectives, a comparison was made of the differences in the achievement (1) between advantaged and disadvantaged students within each of the programs and (2) among rural youth of different ethnic backgrounds within each of the programs.

Schools for this phase of the project were selected by the district supervisors of vocational agriculture. The major criteria used by the supervisors were the number of disadvantaged and minority group students and a teacher who was interested in teaching about agricultural careers.

Five schools were selected from the Southeast District and three from the Northeast District.

The field of agriculture was divided into six appropriate areas of study: (1) Agricultural Production, (2) Agricultural Sales/Services, (3) Agricultural Mechanics, (4) Agricultural Products, (5) Ornamental Horticulture, and (6) Agricultural Resources and Forestry. Occupations for each of these areas were identified and the job descriptions were obtained from the Dictionary of Occupational Titles (30). A revised curriculum unit containing a listing of all agricultural careers and their Dictionary of Occupational Titles code numbers is included in Appendix A.

A pre-test was given to the ninth grade students of eight vocational agriculture departments in Oklahoma. The teachers in the eight schools taught the curriculum units. Following completion of the teaching of the curriculum units, a post-test was given to the students. The post-tests were given approximately four months after the pre-tests. A copy of the pre-post test is included in Appendix B.

In keeping with Lark's (15) suggestions, a representative of the Agricultural Education Department gave the pre- and post-tests to students of each of the eight schools.

Findings

During this phase of the project, the curriculum units were revised and refined according to the recommendations of the teachers and students that participated in Phase II of the project. The major revisions accomplished in this phase were (1) lowering the reading level of all units, (2) illustrating and picture coding the instructional areas,

(3) the combining of the agricultural cluster to eliminate repetition, and (4) the addition of a simulation game. The findings of this study indicate that these revisions as they were utilized were adequate for accomplishing the purposes and objectives of this study.

Use of analysis of variance to test the proposed hypothesis led to the following results: (1) There was a 24.94 point improvement from the pre-tests to the post-tests of students who were taught the career exploration curriculum. This mean gain was significant beyond the .01 level of confidence. (2) The 65 advantaged students had a mean gain of 27.40 compared to the 97 disadvantaged students' mean gain of 23.39. Although the advantaged students' mean gain was 3.11 points greater than the mean gain of the disadvantaged studnets, it was not significant at the .01 level of confidence. (3) Although the Caucasians had a mean gain that was 3.38 points greater than the Blacks and 3.29 points greater than the Indians, the difference was not large enough to be statistically significant at the .01 level. Henceforth, there was no significant difference among the various ethnic groups. (4) The lack of sufficient numbers in some categories precluded a complete statistical analysis. This was especially true of the advantaged Black and advantaged Indian. There were only three advantaged Blacks in the study with a mean gain of 18.33 and only nine advantaged Indians with a mean gain of 32.11. These small numbers must be taken into consideration when interpreting the mean differences, since they may not be representative of the advantaged Black and advantaged Indian populations in Oklahoma.

Conclusions

From the statistical and descriptive analysis, review of the curriculum with the teachers and students, and the experiences of the researcher, the following conclusions were made about the findings of the study:

1. The agricultural career exploration curriculum units as taught did increase the students' knowledge about the information for which they were tested, as evidenced by significant differences between pre- and post-test mean scores.

2. Not enough students represented certain ethnic groups (advantaged Blacks and advantaged Indians) to make a reliable statistical analysis of these groups.

3. The curriculum units as constructed and utilized were adequate for accomplishing the purposes and objectives of the study.

4. Video tapes are an adequate method for bringing occupational information into the classroom. However, the need for a greater selection of video tapes on occupations was pointed out by the teachers.

5. The general units of instruction as taught did increase the students' knowledge and ability in utilizing selected reference material on agricultural careers.

6. Based on the reactions of the teachers and students, the fall semester would be a more advantageous time for the agricultural career exploration curriculum to be taught.

7. Based on the pre- and post-testing done for comparison purposes, the students did achieve the performance objectives listed.

Recommendations

1. Phase III of this project established that the units of curriculum taught by this method produced significant differences in mean scores between pre- and post-tests. Therefore, it is recommended that the project be continued through Phase IV on a broadened base including the development of more specific occupational units, the making of more video tapes on occupations, and the introduction of the program into more schools.

2. A limited number of students from certain socio-ethnic groups were included in this study. To determine if these variables have a significant effect on the attainment of curriculum objectives, it is recommended that a larger proportion of these groups be included in Phase IV of the project.

3. It is recommended that other variables, such as mental ability and class attendance of the students and years of teaching experience of the teacher, which could have a direct bearing upon the accomplishment of the curriculum objectives, should be included in future studies.

4. It is recommended that the units of curriculum developed in this project be made available through the State Department of Vocational-Technical Education Curriculum Division of Oklahoma.

5. It is recommended that a video tape library be established at the State Department of Vocational-Technical Education Curriculum Division so that the tapes may be readily accessible to the teachers.

6. It is recommended that the reading level in all curriculum units be kept as low as possible for ninth grade students, while keeping the basic terminology dealing with careers intact.

7. It is recommended that the curriculum for career exploration in agriculture be taught during the fall semester in order to prevent conflict with FFA and school activities which are more numerous in the spring.

A SELECTED BIBLIOGRAPHY

(1) Baker, Richard A., P. Dilworth, and V. S. Eddy. "A Curriculum Approach to Vocational Choice." American Vocational Journal, Vol. 44 (1969), 57-58.

(2) Boocock, S. S. "Instructional Games." Encyclopedia of Education. New York: The MacMillan Co., 1969.

(3) Croft, Jerry D. Simulation Games for Teachers. Glencoe, Oklahoma: Yost Publishing Company, 1972.

(4) Dewey, John. Human Nature and Conduct. New York: Henry Holt, 1922.

(5) Dewey, John. Democracy and Education. New York: The MacMillan Co., 1928.

(6) Farran, Dale C. "Competition and Learning for Underachievers." Simulation Games in Learning. Ed. Boocock and Schild. Beverly Hills, California: Sage Publications, Inc., 1968, 191-203.

(7) Festinger, L. A. A Theory of Cognitive Dissonance. Stanford, California: Stanford University Press, 1957.

(8) Hamilton, James B. "Youth With Special Needs in Non-Metropolitan Ohio High Schools." (Unpub. Ph.D. dissertation, The Ohio State University, 1967.)

(9) Henderson, Billie L. "Implementation and Evaluation of a Curriculum for Career Exploration in Agricultural Occupations." (Unpub. Ed.D. dissertation, Oklahoma State University, 1973.)

(10) Herr, Edwin L. Decision-Making and Vocational Development. Boston: Houghton-Mifflin Company, 1970.

(11) Hilton, F. J. "Career Decision-Making." Journal of Counseling Psychologists, Vol. 9 (1962), 291-298.

(12) Hoppock, Robert. Occupational Information. New York: McGraw-Hill, 1967.

(13) Kemp, Barbara H. "The Youth We Haven't Served, A Challenge to Vocational Education." Washington, D.C.: Office of Education, 1966.

(14) Key, James P. "Orientation and Occupational Theory." Contemporary Conceptions of Vocational Education. Ed. Gordon F. Law. Washington, D.C.: American Vocational Association, 1971, 255-256.

(15) Lark, Floyd J. "Development and Testing of Selected Curriculum Units for Agricultural Career Awareness in Oklahoma." (Unpub. Ed.D. dissertation, Oklahoma State University, 1972.)

(16) Larson, Milton E. "Analysis for Curriculum Development in Vocational Education." ED 035 746.

(17) National Advisory Council on Vocational Education. The Bridge Between Man and His Work. Washington, D.C.: U. S. Government Printing Office, 1968.

(18) National Association of State Directors of Vocational Education. Position Paper on Career Education. Washington, D.C.: Office of the Executive Secretary, 1971.

(19) Patton, Bobby G. "A Study to Determine the Acceptance and Usefulness of the Basic Core Curriculum for Vocational Agriculture I in Oklahoma." (Unpub. M. S. thesis, Oklahoma State University, 1971.)

(20) Popham, James W. Educational Statistics. New York: Harper and Row, Publishers, 1967.

(21) Popham, James W. "Evaluation of Curriculum Materials and Their Use." (Mimeographed booklet, Center for the Study of Evaluation, Los Angeles, California, 1969.)

(22) Popham, James W., and Eva L. Baker. Systematic Instruction. Englewood Cliffs, New Jersey: Prentice-Hall, Inc., 1970.

(23) Research Coordinating Unit. Statewide Results of the Study: Plans of High School Seniors, 1967. Stillwater, Oklahoma: State Department of Vocational and Technical Education, 1967.

(24) Super, Donald E. "A Theory of Vocational Development." American Psychologist, Vol. 8 (1953), 185-190.

(25) Super, Donald E. The Vocational Maturity of Ninth Grade Boys. New York: John Wiley and Sons, 1962.

(26) Super, Donald E. "Self Concepts in Vocational Development." Self-Concept Theory. Ed. Donald E. Super, Ruben Starishensky, Norman Matlen, and Jean P. Jordan. New York: Teachers College, Columbia University, 1963, 1-15.

(27) Taba, Hilda. Curriculum Development. New York: Harcourt, Brace, and World, Inc., 1962.

(28) United States Department of Health, Education and Welfare. Objectives for Vocational and Technical Education in Agriculture. Washington, D.C.: U. S. Government Printing Office, 1966.

(29) United States Department of Health, Education and Welfare. Vocational Education and Occupations. Washington, D.C.: U. S. Government Printing Office, 1969.

(30) United States Department of Labor. Dictionary of Occupational Titles, 3rd ed., Volumes I and II. Washington, D.C.: U. S. Government Printing Office, 1965.

(31) Venn, Grant. Man, Education, and Work. Washington, D.C.: American Council on Education, 1967.

APPENDIXES

APPENDIX A

AGRICULTURAL CAREERS
UNIT: OCCUPATIONAL CLUSTERS

TERMINAL OBJECTIVES

After completing this unit of instructions, the student should be able to identify the seven occupational clusters in agri-business and natural resources. The student should be aware of the different occupational choices available to him in an occupation. He should be able to identify several of the specific occupations, ways a high school student could enter the occupation, and determine if he has an interest in finding a career in the general area of agri-business and natural resources. This knowledge will be shown by finishing assignment sheets and by scoring eighty-five per cent on the post test.

SPECIFIC OBJECTIVES

After finishing this unit of instruction, the student should be able to:

1. Match terms associated with career and occupations in agri-business and natural resources to correct definitions.

2. Discuss in a short paragraph ways to enter an agri-business and natural resources occupation of your choice.

3. Determine the net demand for the occupations in any of the seven agri-business and natural resource clusters from the OTIS Report.

4. Discuss in a short paragraph the education and experiences needed for an occuaption in one of the seven clusters.

5. List three specific occupational clusters available in the general occupational cluster of your choice.

6. Match the definition of the instructional program with the correct occupational cluster of your choice.

7. List one specific occupation in each agri-business and natural resources cluster when given the cluster.

AGRICULTURAL CAREERS
UNIT: OCCUPATIONAL CLUSTERS

SUGGESTED ACTIVITIES

I. Instructor:
   A. Provide student with objective sheets, information sheets, and assignment sheets.
   B. Discuss final and specific objectives with students.
   C. Discuss information sheets and assignment sheets with students.
   D. Give test.

II. Student:
   A. Discuss objectives with instructor.
   B. Study information sheets.
   C. Complete assignment sheets.
   D. Take test.

INSTRUCTIONAL MATERIALS

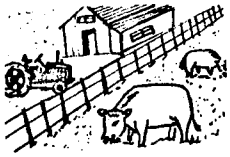
I. Include in this unit:
   A. Objective Sheet
   B. Information Sheets
   C. Assignment Sheets

II. Additional Materials:
   A. "Summarized Information on Vocational Occupations in Agri-Business and Natural Resources."
   B. OTIS (Occupational Training Information Service) Department of Vocational and Technical Education, Stillwater, Oklahoma
   C. Hoover, Norman K., D.Ed. HANDBOOK OF AGRICULTURAL OCCUPATIONS, The Interstate Printers & Publishers, Inc., Danville, Illinois, 1969.

AGRICULTURAL CAREERS
UNIT: OCCUPATIONAL CLUSTERS

INFORMATION SHEET

I. Terms and definitions

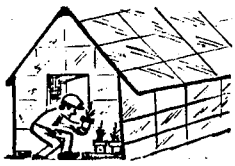


A. Agricultural Production--Subject matter and learning activities which are concerned with the principles and processes involved in the planning related to the economic use of facilities, land, water, machinery, chemicals, finance, and labor in the production of plant and animal products. Activities include classroom instruction and laboratory experiences in and out of school, including farms, ranches, and other agriculturally related establishments.

B. Agricultural supplies and services occupations are those occupations involved in providing consumable supplies used in the production phase of agriculture, including processing, marketing, consulting, and other services.

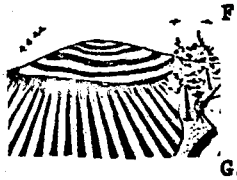
C. Agricultural mechanics occupations are those occupations involved in the assisting with and/or performing the common and important operations on processes concerned with the selection, operation, maintenance, and use of agricultural power, agricultural machinery and equipment, structures and utilities, soil and water management, and agricultural machine shop, including sales and servies.

D. Agricultural Products--Production or output from farms and ranches are of two types; food products and non-ffod products. Occupations in agricultural products inclde processing, inspection, and marketing.



E. Ornamental horticulture occupations are those dealing with the establishing, maintaining, and managing ornamental horticulture enterprises such as woody plants to be used for decoration or shade purposes, field and greenhouse production of flowers and the arrangement of such flowers for ornamental purposes, and the principles and practices involved in locating, planting, and maintaining turf, plants, shrubs, or devices for the beautification of home grounds and other areas of human habitation and recreation.

INFORMATION SHEET



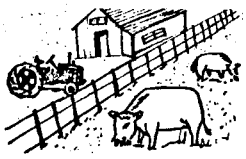
F. Agricultural resources occupations are those occupations involved in the conservation and improvement of resources such as forests and other natural areas, fish and wildlife, soil, water, and air, for economic and recreational purposes and in the establishment and management of recreational facilities.

G. Forestry occupations are concerned with the multiple use of forest lands and resources, including their management and protection. Much of the nation is in forest cover. Many privately-owned small tracts still exist in addition to the great Federal, State, and industrial forests. These forests are used for lumber, pulpwood, and other forest products, such as gum, maple syrup, greens. They are also used for recreation.

II. Requirements for entry into the Agricultural Occupation Clusters

A. Agricultural Production

1. Self Employment



Self-employed in agricultural production - The foundation or base of most of the total agricultural industry is Agricultural production. Therefore, as you consider agri-business occupations, you should understand the various types of agricultural production and how to become self-employed in them.

To enter the agricultural production as a self-employed person will likely require you to have sufficient capital and credit to get started as an owner-operator or as a tenant. You may begin by working at home, acquiring livestock and equipment as a part of your farming program in vocational agriculture, and in time, form a partnership with your parents. If this opportunity is not available, you will have to obtain capital as a farm hand, a tenant farmer, a part-time farmer, or in some other way.

When you determine the specific type of agriculture production you want to become established in, you should find out the amount of capital involved, the opportunities that you have in your particular situation, and the steps that you must take to attain the goal.

2. Paid Employment

Paid employees in agricultural production - To some people, Agricultural Production through "farming" or "ranching" means that one person owns, operates, and manages a farm or ranch with the help of his immediate family. This was true in the United States for many years but it is not necessarily true today. In many areas farms and ranches have become large business enterprises with absentee owners, highly trained managers, and a number of people employed for specialized jobs. In other cases, the family or general farm, in order to continue as an economic unit, has increased in size so that hired help and services of people other than the operator's family are required.

This change in the agricultural economy has increased the opportunities for employment of farm managers, herdsmen, caretakers, farm and ranch hands, and farm and ranch custom workers.

If you decide to enter agricultural production as a paid employee, the opportunities for you may be to follow an apprentice type approach. This type of an approach could start while you are still in school by working as a farm or ranch hand. This may be followed by becoming a caretaker, a herdsman, or a manager. Although the usual starting place is a farm or ranch, you do not have to remain in this position.

3. Educational Requirements

Although farmers and ranchers do not specifically require a particular kind or amount of formal education, they must have a broad knowledge. Consequently, a high school education is desirable as it provides the general education required of the present day farmer and rancher. The student will find courses in vocational agriculture especially valuable in providing an overall knowledge in agricultural production. The vocational agricultural programs also offer opportunity to develop many beneficial basic skills, such as mechanics, bookkeeping, taking inventory, and figuring various costing methods. Also, following graduation, continuing education is available through young farmer classes, extension classes, etc.

Many farmers and ranchers have found agricultural college and university education a worthwhile investment in preparation for managing agricultural production enterprises on a modern farm or ranch.

A good educational background, actual agricultural production experience on a farm or ranch is of utmost importance. You should be familiar with the actual work to be done and with the managerial decisions that have to be made before taking on the responsibilities of managing a farm or ranch.

B. Agricultural Supplies and Services

1. Self Employment

Self-employed in agricultural supplies and services - To enter as a self-employed person, one would have to have sufficient capital and credit to acquire the business location and inventory. You may begin by working in a supply and service business while still in school, thereby getting experience and perhaps some stock in the business. If this opportunity is not available to you, you will have to obtain the capital in some other way.

2. Paid Employment

Paid employees in agricultural supplies and services - If you decide to enter agriculture supplies and services as a paid employee, the opportunities for you may be to follow an apprentice type approach. This type of an approach could start while you are still in school as a student in Vocational Agriculture and by working as an employee in an agricultural supply and service business.

3. Educational Requirements

The student will find considerable skill, experience, and education are required in performing some agricultural supplies and services jobs; others can be done with limited training. The student, however, should be interested in farm and ranch work, should have a general knowledge of farming and ranching, and should be interested in meeting the public, and have some business management ability. Desirable training includes a farm or ranch background, high school vocational agriculture, and some study in the particular type of work involved in the specific occupation within agriculture supplies and services.

C. Agricultural Mechanics

1. Self Employment

Self-employed in agricultural mechanics - To enter as a self-employed person, one would have to have sufficient capital and credit to acquire the business location, inventory, equipment and consumable supplies to operate the business.

It would be helpful if you begin working in an agricultural mechanics business while still in school, thereby getting experience and perhaps some stock in a business. If this opportunity is not available to you, you will have to get the capital and experience some other way.

2. Paid Employment

Paid employees in occupations in agricultural mechanics - If you decide to enter the occupation as a paid employee, the opportunities for you may be to follow an apprentice type approach. This type of an approach could start while you are still in school by taking courses in vocational agriculture and by working for agricultural mechanics and agricultural power and machinery businesses.

The usual place for you to start in one of the occupations is as a laborer, mechanic, welder or parts helper or apprentice.

Many of the agricultural mechanics and agricultural power and machinery companies will employ young men who are in school and taking vocational agricultural courses on a part-time basis and during busy seasons. As you learn the business, and gain experience you may qualify for advancements to supervisory or management positions.

Technical competence, a sincere interest in the welfare of the business, the ability to get along with supervisors and fellow workers, continued self-improvement efforts, and a willingness to accept responsibility are some of the factors that are desirable in an individual.

3. Educational Requirements

The kind and amount of education required for occupations in the field of agricultural mechanics will vary depending upon the occupation (services or sales) and the business.

There are no specific requirements for employment as mechanics or welder helpers and many of the other service occupations; however, you will find a high school education helpful and even demanded by many employers. Vocational agriculture will be an asset to you because there you will learn many of the basic skills.

Training programs through high school vocational agricultural mechanics classes, vocational-technical schools, machinery companies, or short courses at an agricultural college or community college are almost mandatory for you to acquire the skills and know-how needed to repair present-day agricultural power and machinery.

In the sales area of agricultural mechanics a high school education is very important and post-high school courses in agricultural mechanics occupations of interest to you will be helpful.

If continued advancement to occupations such as agricultural power and machinery fieldman is desired, a college education is a requirement with most companies.

Specific educational and personal qualifications for the occupation of interest to you may be found in the units of instruction for the specific occupation.

D. Agricultural Products

1. Self Employment

Self-employed - To enter the field of processing, inspection, and marketing of agricultural products as a self-employed person will require sufficient capital and credit to provide

for the buildings, grounds, and equipment as well as the inventory of consumable supplies, labor and the agricultural products one is working with.

When you determine the specific agricultural product you want to process and market, you should find out the amount of capital involved, the opportunities that you have in your particular situation, and the steps that you must take to attain the goal.

2. Paid Employment

Paid employees in occupations in agricultural products - If you decide to enter the occupation as a paid employee, the opportunities for you may be to follow an appprentice type approach. This type of an approach could start while you are still in school by taking courses in vocational agriculture and working for an individual or comapny that processes, inspects, and markets agricultural products. As you learn the business, and gain experience you may qualify for advancement to management positions.

3. Educational Requirements

The kind and amount of education required for occupations in the field of agricultural products will vary depending upon the occupation, company, local and state requirements.

A high school education with emphasis on business education and vocational agriculture will give you a good background if you plan to enter this occupation. Vocational Agriculture in high school will provide you with the general knowledge of all agricultural products.

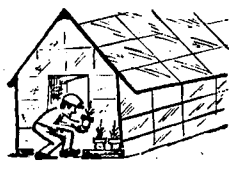
Practical work experience, such as part-time work while still in school through the vocational agricultural program, in plants and on farms and ranches will be valuable.

A high school diploma is necessary for job entry and many jobs on the inspector and grader level require post-high school or college training.

Specific educational and personal qualifications for the occupation of interest to you may be found in the units of instruction for that specific occuaption.

E. Ornamental Horticulture

1. Self Employment



Self-employed - To enter ornamental horticulture as a self-employed person will require you to have sufficient capital and credit to get started as an owner-operator of a florists business, garden center business, greenhouse and nursery business, or service business such as landscaping and grounds maintenance business. You may begin by working at home if

your father owns or manages such a business. You may acquire the experiences, equipment, etc., as part of your supervised work experience program while still in school and taking vocational agriculture. The opportunity to form a partnership with your parents or some one else may be available to you.

2. Paid Employment

Paid employees in ornamental horticulture - If you decide to enter an ornamental horticultural occupation as a paid employee, the opportunities for you may be to follow an apprentice type approach. This type of an approach could start while you are still in high school through your vocational agriculture classes or part of your supervised work experience program.

Floral shops employ part-time help during rush seasons, holidays, and vacation time for their regular employees.

Greenhouses and nurserymen also employ part-time help during rush seasons, holidays, and weekends.

3. Educational Requirements

The kind and amount of education required for occupations in the field of ornamental horticulture will vary depending upon the occupation, company, and local and state requirements. The level of employment in the occupations also varies with the experience and education of the employee. In most instances a high school graduate with no additional education or experience will enter as a laborer. Short courses, taken at agricultural colleges or universities, provide sufficient education to enable him to enter these occupations at a high level. Many of these occupations provide lines of promotion from laborer to caretaker, foreman, manager,or a similar position.

A high school education is very important if you are preparing to become a florist. Courses in art, business management, and floral arrangement will be helpful.

A high school education with emphasis on the biological sciences and vocational agriculture is basic training for ornamental horticultural occupations. Specific educational and personal qualifications for the occupation of interest to you may be found in the units of instruction for the specific occupation.

F. Agricultural Resources

1. Self Employment

Self-employed in agricultural resources - To enter as a self-employed person, one would have to have sufficient capital and credit to acquire a recreational facility such as a park,

farm or ranch and the necessary inventory of consumable supplies and equipment, and labor force to operate the business.

2. Paid Employment

Paid employees in agricultural resources occupation - This method provides the most opportunity for entry as many of the openings are with local, state, and national governmental agencies. If you decide to enter agricultural resources occupations as a paid employee, the opportunities for you may be to follow an apprentice type approach. This type of an approach could start while you are still in school as a student of vocational agriculture and by working as a part-time and summer employee in one or more of the occupations within the agricultural resources cluster.

3. Educational Requirements

The student will find considerable skill, experience and education are required in performing some of the agricultural resources jobs; others can be done with limited training as the jobs vary from labor to highly technical and supervisory type activities. Desirable training includes a farm or ranch background, high school vocational agriculture, and some study in the particular type of work involved in the specific occupation within agricultural resources.

The occupations coming under the Federal Soil Conservation Service and others having a Civil Service classification will have to meet requirements of the various ratings (Example: Education and experience requirements for a GS-3 are graduation from high school and one year of general experience.)

The student should check with the education and experience requirements for the specific occuaption which is of interest to him.

G. Forestry

1. Self Employment

Self-employed - To enter forestry as a self-employed person will require you to have sufficient capital and credit to get started as an owner-operator or as a tenant. You may begin by working at home if your father owns or leases a tract of forest land. You may acquire equipment and etc., as part of your farming program in vocational agriculture, and in time, form a partnership with your parents. If this opportunity is not available, you will have to obtain capital as a forest hand or special forest products worker in some other way.

A high percentage of special forest products workers are self-employed. They may harvest products on their own land, from leased private land, or on public land by leasing it.

When you determine the specific type of forestry occupation you want to become involved in, you should find out the amount of capital involved, the marketing possibilities, the opportunities that you have in your particular situation, and the steps that you must take to attain the goal.

2. Paid Employment

Paid employees in a forestry occupations - If you decide to enter a forestry occupation as a paid employee, the opportunities for you may be to follow an apprentice type approach. This type of an approach could start while you are still in school and through your vocational agricultural classes as part of your work program. Jobs are found at state and national forests and parks, and with logging contractors, forests consultant businesses, and forestry products industries. Part-time work during the school year and summer employment may be a good place to start.

3. Educational Requirements

A high school education is normally preferred and post high school education is desirable but may not be required, depending on the skill and technical knowledge required for your particular job.

A knowledge of the tree species in your area is desirable. Any technical forestry knowledge will be most important in your advancements. Some vocational-technical schools, junior colleges, and community colleges are now offering one and two-year courses in forestry technology. A top worker can serve a six-year apprenticeship under a certified logging or forestry engineer and then apply for certification by taking a written examination. A college graduate may do the same thing, but need serve only a two-year apprenticeship.

III. Based on the Occupations Training Information System, Cycle Four Report (OTIS Report) the total demand is 1298 less the supply of 808, leaving a net demand of 490 for 1972 for all the occupations within the agricultural production cluster.

A. The total demand is 294 less the supply of 108, leaving a net demand of 186 for 1972 for all the occupations within the agricultural supplies and services cluster.

B. The total demand is 770 less the supply of 779 leaving a net demand of a negative 9 for 1972 for all occupations within the agricultural resources cluster.

C. The total demand is 89 less the supply of 48, leaving a net demand of 41 for 1972 for all the occupations within the agricultural products cluster.

D. The total demand is 258 less the supply of 56, leaving a net demand of 202 for 1972 for all occupations within the ornamental horticulture cluster.

E. The total demand is 14 less the supply of 26, leaving a net demand of a negative 12 ofr 1972 for all occupations within the forestry cluster.

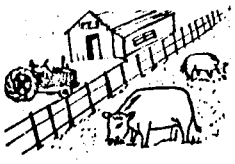
NOTE: The instructor should refer to the OTIS Report for additional information concerning the number of employees needed in each occupation. If copies of these studies are needed, please write the Curriculum and Instructional Materials Center.

AGRICULTURAL CAREERS
UNIT: OCCUPATIONAL CLUSTERS

INFORMATION SHEET SUPPLEMENT

IV. The specific occupations in each of the seven agri-business and natural resources clusters are in this information sheet supplement.

A. Agricultural Production O.E. 01.01



Field Man	DOT 180.118-010
Group Leader	DOT 180.168-026
Migrant Leader	DOT 180.168-034
Farmer, General	DOT 421.181-010
Farm Hand, General	DOT 421.883-010
Caretaker, Farm	DOT 421.884-010
Farm Foreman	DOT 429.131-010

Animal Science O.E. 01.0101

Horse Trainer	DOT 153.228-026
Farmer, Dairy	DOT 411.181-010
Herdsman	DOT 411.181-014
Farm Hand, Dairy I	DOT 411.884-010
Farm Hand, Dairy II	DOT 411.884-014
Milking Machine Operator	DOT 411.885-010
Poultry Breeder	DOT 412.181-014
Poultryman, Egg	DOT 412.181-018
Poultryman, Meat	DOT 412.181-022
Farm Hand, Poultry	DOT 412.884-014
Laborer, Hatchery	DOT 412.887-014
Stock-Ranch Foreman	DOT 413.131-010
Camp Tender	DOT 413.138-010
Cattle Rancher	DOT 413.181-010
Goat Keeper	DOT 413.181-014
Herdsman, Swine	DOT 413.181-018
Horse Breeder	DOT 413.181-022
Sheep Rancher	DOT 413.181-026
Farm Hand, Livestock	DOT 413.884-018
Ranch Hand	DOT 413.884-030
Barn Boss	DOT 419.131-010
Animal Breeder	DOT 419.181-010
Bee Keeper	DOT 419.181-014

INFORMATION SHEET SUPPLEMENT

Plant Science O.E. 01.0102

Manager, Production	DOT 180.168-030
Superintendent	DOT 180.168-038
Superintendent, Production	DOT 180.168-042
Field Supervisor, Seed Production	DOT 180.168-018
Detasseling-Crew Supervisor	DOT 401.137-010
Area Foreman	DOT 401.138-010
Farmer, Cash Grain	DOT 401.181-010
Cotton Grower	DOT 402.181-010
Farm Hand, Cotton	DOT 402.883-010
Row Boss, Thinning	DOT 403.137-010
Vegetable Grower	DOT 403.181-010
Farm Hand, Vegetable	DOT 403.883-010
Seed Cutter	DOT 403.886-010
Fruit-Farm Foreman	DOT 404.131-010
Grove Foreman	DOT 404.137-010
Berry Grower	DOT 404.181-010
Grape Grower	DOT 404.181-014
Orchadist	DOT 404.181-018
Cranberry Picker, Machine	DOT 404.883-010
Farm Hand, Citrus Fruit I	DOT 404.883-014
Farm Hand, Fruit I	DOT 404.883-018
Fruit-Harvester Operator	DOT 404.883-022
Shaking-Machine Operator	DOT 404.883-026
Farm Hand, Berry	DOT 404.887-010
Farm Hand, Fruit II	DOT 404.887-018
Drug Grower	DOT 405.181-010
Hay Farmer	DOT 405.181-014
Hop Grower	DOT 405.181-018
Peanut Farmer	DOT 405.181-022
Sugarcane Planter	DOT 405.181-026
Tobacco Grower	DOT 405.181-030
Peanut Picker Operator	DOT 405.885-010
Farm Hand, Hops	DOT 405.885-010
Farm Hand, Tobacco	DOT 405.887-014
Harvest Hand, Broomcorn	DOT 405.887-018
Harvest Hand, Peanut	DOT 405.887-022
Harvest Hand, Sugarcane	DOT 405.887-026
Mushroom Grower	DOT 406.181-018
Seed Grower	DOT 406.181-018
Picking Crew Foreman	DOT 409.137-010
Laborer, Seed Corn	DOT 429.885-010
Laborer, Orchard Fumigation	DOT 465.887-018

Farm Mechanics O.E. 01.0103
(See the category 01.03 Agricultural Mechanics)

INFORMATION SHEET SUPPLEMENT

Farm Business Management O.E. 01.0104

General Manager	DOT 180.168-022
Manager, Farm	DOT 409.168-010
Farm, Tenant	DOT 409.181-010

B. Agricultural Supplies/Services O.E. 01.02

Biological Aid	DOT 049.384-010
County Agricultural Agent	DOT 096.128-014
Artificial-Breeding Distributor	DOT 180.168-014
Director, Agricultural Labor Camp	DOT 187.168-018
Four-H Club Agent	DOT 096.128-
Artificial-Breeding Technician	DOT 467.384-014
Artificial Inseminator	DOT 467.384-010
Agricultural Aid	DOT 421.384-010
Farm Hand, General	DOT 421.883-010
Harvest Contractor	DOT 469.158-010

Agricultural Chemicals O.E. 01.0201

Exterminator Supervisor	DOT 389.138-010
Flight-Control Foreman	DOT 465.137-010
Spray Foreman	DOT 456.137-014
Scout	DOT 456.482-020
Weed Inspector	DOT 456.781-010

Feeds O.E. 01.0202

Salesman, Grain and Feed Products	DOT 262.358-014
Contractor, Field Hauling	DOT 469.168-010
Feed Mixer	DOT 520.885-122
Feed-Mixer Helper	DOT 520.886-302
Processor, Grain	DOT 521.885-302
Custom-Feed-Mill-Operator Helper	DOT 521.886-026
Superintendent, Grain Elevator	DOT 529.138-026

Seeds O.E. 01.0203

Seed Analyst (profess., & kin.)	DOT 040.381-014

INFORMATION SHEET SUPPLEMENT

Fertilizers (Plant Food) O.E. 01.0204

Agricultural Supplies/Services, Other O.E. 01.0299

Laboratory Technician, Veterinary	DOT 073.381-010
Salesman, Veterinarian Supplies	DOT 282.358-010
Horseshoer	DOT 356.381-010
Veterinary-Hospital Attendant	DOT 356.874-046
Tree Pruner	DOT 404.884-014
Poultry Debeaker	DOT 412.887-018
Poultry Technician	DOT 412.387-010
Chicken Sexer	DOT 412.687-014
Chick Grader	DOT 412.687-010
Poultry Vaccinator	DOT 412.884-022
Poultryman, Technical Advisor	DOT 429.228-010
Wool Shearer, Contract	DOT 467.138-010
Artificial-Breeding Technician	DOT 467.384-014
Artificial Inseminator	DOT 467.384-010
Blood Tester, Fowls	DOT 467.384-028
Poultry Inseminator	DOT 467.384-022

C. Agricultural Mechanics O.E. 01.03

Agricultural Power and Machinery O.E. 01.0301

Service Salesman, Milking Machines	DOT 277.251-010
Winnowing-Machine Operator	DOT 404.885-010
Farm-Equipment Operator	DOT 409.833-010
Hop-Picking-Machine Operator	DOT 424.132-010
Heavy Equipment Operator	DOT 424.883-010
Chopper Operator, Stationary	DOT 424.886-010
Tractor Mechanic	DOT 620.281-094
Tractor Mechanic Helper	DOT 620.884-050
Farm-Machinery Set-Up Man	DOT 624.381-014
Inspector and Tester	DOT 624.381-018
Farm-Equipment Mechanic I	DOT 624.281-010
Farm-Equipment-Mechanic Apprentice	DOT 624.281-014
Farm-Equipment Mechanic II	DOT 624.381-010
Assembly Repairman	DOT 624.781-018
Greaser	DOT 624.884-101

INFORMATION SHEET SUPPLEMENT

Agricultural Structure and Conveniences O.E. 01.0302

Soil Management O.E. 01.0303

Water Management O.E. 01.0304

Irrigator, Head	DOT 422.137-010
Zanjero	DOT 422.181-010
Irrigator, Valve Pipe	DOT 422.884-010
Irrigator,	DOT 422.887-014
Irrigator, Sprinkling System	DOT 422.887-018
Irrigator, Standpipe	DOT 422.887-022

Agricultural Mechanics Skills O.E. 01.0305

Agricultural Construction and Maintenance O.E. 01.0306

Agricultural Electrification O.E. 01.0307

Agricultural Mechanics, Other O.E. 01.0399

Agricultural Products (Processing, Inspection, and Marketing) O.E. 01.04

Laboratory Technician	DOT 040.381-010
Breeding	
Apiary Inspector	DOT 168.287-014

Food Products O.E. 01.0401

Veterinary Livestock Inspector	DOT 073.181-010
Veterinary Virus-Serum Inspector	DOT 073.281-010
Buyer, Livestock	DOT 162.168-054
Field-Contact Man	DOT 162.158-082
Buyer, Agricultural Products	DOT 162.158-026
Buyer, Grain	DOT 162.168-010
Veterinary Meat Inspector	DOT 168.284-014
Poultry Inspector	DOT 168.287-086
Poultry Grader	DOT 168.287-082
Manager, Food Processing Plant	DOT 185.168-034
Watermelon Inspector	DOT 403.687-010

INFORMATION SHEET SUPPLEMENT

Egg-Room Foreman	DOT 412.137-010
Manager, Hatchery	DOT 412.168-010
Brand Inspector	DOT 413.684-010
Livestock Caretaker, Yard-or-in-Transit	DOT 466.887-010
Honey Grader and Blender	DOT 520.381-010
Rice Miller	DOT 521.138-010
Egg-Breaking-Machine Operator	DOT 521.885-122
Grader Man	DOT 521.885-170
Grinder Operator	DOT 521.885-186
Smoker	DOT 522.782-042
Neutralizer Man	DOT 522.884-010
Pickler	DOT 522.884-014
Honey Processor	DOT 522.885-062
Preparation Foreman	DOT 523.137-010
Maple Syrup Maker	DOT 523.782-050
Dehydrator Man	DOT 523.885-070
Butcher, All-Round	DOT 525.381-010
Stunner, Animal	DOT 525.887
Shackler	DOT 525.887
Sticker, Animal	DOT 525.884
Head Timmer	DOT 525.884
Carcass Splitter	DOT 525.884
Offal Man	DOT 521.884
Washer, Carcass	DOT 525.884
Shrouder	DOT 525.887
Shaver	DOT 525.887
Hide Trimmer	DOT 525.887
Boner, Meat	DOT 525.884
Skinner	DOT 525.884
Smoked Meat Preparer	DOT 525.887
Grader, Meat	DOT 525.387-010
Fruit-Buying Grader	DOT 529.387-022
Egg Candler	DOT 529.678-018
Sorter, Agricultural Produce	DOT 529.687-054

Dairy Products O.E. 01.040102

Milk Receiver	DOT 222.687
Milk Sampler	DOT 379.887
Dairy Tester	DOT 469.381
Cottage-Cheese Maker	Dot 522.782
Batch Freezer	DOT 523.885
Cheesemaker	DOT 529.381
Grader	DOT 529.387

INFORMATION SHEET SUPPLEMENT

Buttermaker	DOT 529.782
Cheesemaker Helper	DOT 529.782
Dairy-Processing-Equipment Operator	DOT 529.782
Freezer Man	DOT 529.782
Dairy Helper	DOT 529.886

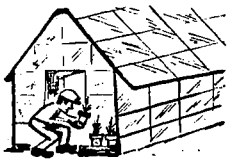
Non-food Products O.E. 01.0402

Buyer, Tobacco	DOT 162.168-014
Salesman,Raw Wool	DOT 261.358-010
Wool-Fleece Grader	DOT 413.687-010
Cotton Classes	DOT 469.387-010
Tobacco Curer	DOT 523.782-062

Agricultural Products, Other O.E. 01.0499

Ornamental Horticulture (Production, Processing, Marketing, and Services) O.E. 01.05

Arboriculture O.E. 01.0501



Tree-Farming Foreman	DOT 407.138-014
Tree Surgeon	DOT 409.181-014
Tree-Surgeon Helper	DOT 409.884-014

Floriculture O.E. 01.0502

Flower Grower	DOT 406.181-010

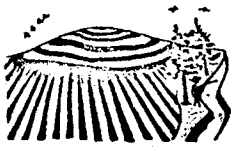
Greenhouse Operation and Management O.E. 01.0503

Landscaping O.E. 01.0504

Landscape Gardener	DOT 407.181-010
Grounds Keeper	DOT 407.884-010
Nurseryman	DOT 406.168-010
Laborer, Nursery	DOT 406.884-010
Groundman-	DOT 406.887-022
Moss Handler	DOT 406.887-026

INFORMATION SHEET SUPPLEMENT

Nursery Worker	DOT 406.887-030
Bagger-and Burlap Man	DOT 406.887-010
Greenskeeper	DOT 407.137-010
Superintendent, Greens	DOT 407.138-010



Agricultural Resources (Conservation, Utilization, and Services) O.E. 01.06

Airplane Pilot-Conservation Officer DOT 180.168-010

Forests O.E. 01.0601

Jumpmaster	DOT 441.128-010
Suppression-Creq Leader	DOT 441.137-010
Fire Lookout	DOT 441.168-010
Fire Warden	DOT 441.168-014
Forester Aid	DOT 441.384-010
Fire Patrolman	DOT 441.687-010
Forest-Fire Fighter	DOT 441.887-010

Recreation O.E. 01.0602

Park Ranger	DOT 169.168-070
Fish and Game Warden	DOT 379.168-018
Park Caretaker	DOT 407.868-010
Camp-Ground Caretaker	DOT 407.887-010
Park Worker	DOT 407.887-022
Hunting and Fishing Guide	DOT 452.868-010

Soil O.E. 01.0603

Soil Conservationist	DOT 040.081-074

Wildlife (Including Game Farms and Hunting Areas) O.E. 01.0604

Gamekeeper	DOT 451.181-010
Predatory-Animal Hunter	DOT 451.781-014
Trapper	DOT 451.781-018
Bird Trapper	

INFORMATION SHEET SUPPLEMENT

Water O.E. 01. 0605

Industrial-Waste Inspector	DOT 168.287-054

Air O.E. 01.0606

Fish (Including Farms and Hatcheries) O.E. 01.0607

Fish Culturist	DOT 041.168-010
Alligator Farmer	DOT 436.181-010
Fish Farmer	DOT 436.181-014
Frog Grower	DOT 436.181-018
Hatchery Man	DOT 436.884-022
Frog-Farm Laborer	DOT 436.887-010

Range O.E. 01.0608

Forestry (Production, Processing, Management, Marketing And Services) O.E. 01.07

Animal Caretaker	DOT 356.874-010
Animal Keeper	DOT 356.138-014

Forests (For definition see 01.0601, Forests, under Agricultural Resources.) O.E. 01.0701

Forest Protection O.E. 01.0702

Logging (Harvesting and Transportation) O.E. 01.0703

Buyer, Log	DOT 162.158-058
Field Man	DOT 162.158-078
Logging Contractor	DOT 183.168-030
Chief Cruiser	DOT 449.168-010
Cruiser	DOT 449.187-010
Logging-Operations Inspector	DOT 449.287-014
Seed-Cone Picker	DOT 449.887-010

Wood Utilization O.E. 01.0704

Recreation (For definition see 01.0602, Recreation, under Agricultural Resources) O.E. 01.0705

INFORMATION SHEET SUPPLEMENT

Special Products O.E. 01.0706

Field Man, Christmas Trees	DOT 162.158-086
Woods Rider	DOT 442.137-010
Woods Boss	DOT 442.138-010
Manager, District	DOT 442.168-010

Agriculture, Other O.E. 01.0799

Animal Keeper	DOT 356.874-014
Dog Pound Attendant	DOT 356.874-026
General Helper, Lab	DOT 356.874-030
Kennelman	DOT 356.874-038
Animal Correlater	DOT 419.884-010
Grubber	DOT 429.887-014

AGRICULTURAL CAREERS
UNIT: OCCUPATIONAL CLUSTERS

ASSIGNMENT SHEET 1

DETERMINING THE NET DEMAND FOR OCCUPATIONS

After the discussion on the use of the Occupational Training Information System (OTIS Report) and the Agricultural Occupations Handbook, the student should complete this assignment sheet from the information found in the two reports. This assignment on agricultural production is used as an example to follow.

Net Additional Manpower Requirements

1972

State Wide Totals for Oklahoma (Page 6 OTIS Report)

Cluster of Occupations	Demand	Supply All Sources	Demand Minus Supply	Cluster Of Programs
1.				
2.				
3.				
4.				
5.				
6.				010100 Agricultural Production
7.				160201 Ranch Operations
TOTAL				

Where does 0101-0 Agricultural Production rank in the state wide manpower demand?

(Page 37-38 in OTIS Report Cycle 4)
(Note: Manpower demands by districts, P. 37-38)

AGRICULTURAL CAREERS
UNIT: OCCUPATIONAL CLUSTERS

ASSIGNMENT SHEET 2

DETERMINING THE NET DEMAND FOR OCCUPATIONS

After the discussion on the use of the Occupational Training Information System (OTIS Report) and the Agricultural Occupations Handbook, the the student should complete this assignment sheet from the information found in the two reports. This assignment on agricultural production is used as an example to follow.

Net Additional Manpower Requirements

1972

Statewide Totals for Oklahoma (Page 6 OTIS Report)

	Cluster of Occupations	Demand	Supply All Sources	Demand Minus Supply	Cluster Of Programs
1.					
2.					
3.					
4.					
5.					
6.					
7.					
TOTAL					O.E. No. of Cluster

Where does the occupation of your choice rank in the statewide manpower demand?

_____

(Page 37-38 in OTIS Report Cycle Four)
(Note: Manpower demands by districts, P. 37-38)

AGRICULTURAL CAREERS
UNIT: OCCUPATIONAL CLUSTERS

ASSIGNMENT SHEET #3 - USING RESOURCE MATERIAL

After the information sheet and information sheet supplement, the student should be able to complete the assignment sheet by using the resource materials. Agricultural Production is used as an example to follow.

Complete by filling in the blanks.

General Occupational Cluster	Specific Occupational Clusters	Specific Occupations
OE 01.01 Agricultural Production	OE 01.0100 Agricultural Production	1. DOT 180.118-010 Field Man
		2. DOT
OE 01.01_____	OE 01.0101 Animal Science	1. DOT_____
_____	_____	2. DOT_____
OE 01.01_____	OE 01.0102_____	1. DOT_____
_____	_____	2. DOT_____
OE 01.01_____	OE 01.0104_____	1. DOT_____
_____	_____	2. DOT_____

AGRICULTURAL CAREERS
UNIT: OCCUPATIONAL CLUSTERS

ASSIGNMENT SHEET #4 - USING RESOURCE MATERIAL

After the information sheets and information sheet supplement, the student should be able to complete the assignment sheet by using the resource material. The student should select the clusters of interest to him and from them choose the specific occupations that he wishes to explore. Complete the assignment by filling in the blanks following the example used in Assignment #3

General Occupational Cluster	Specific Occupational Clusters	Specific Occupations
OE_____	OE_____	1. DOT_____
OE_____	OE_____	1. DOT_____
_____	_____	2. DOT_____
OE_____	OE_____	1. DOT_____
_____	_____	2. DOT_____
OE_____	OE_____	1. DOT_____
_____	_____	2. DOT_____
OE_____	OE_____	1. DOT_____
_____	_____	2. DOT_____

AGRICULTURAL CAREERS
UNIT: OCCUPATIONAL CLUSTERS

TEST

1. Match the following terms with the correct definition:

a. ____ Agricultural Production	1. Involved in providing or growing crops and livestock
b. ____ On-farm-work	2. The general area within the cluster or field of agribusiness which is concerned with the production of plant and animal products.

2. Match the definitions of the instructional program with the correct general and/or specific agricultural production occupational cluster.

a. ____ Farm Business Management	1. Subject and learning activities which are concerned with the principles and processes involved in the planning related to and the economic use of facilities, land, water, machinery, chemicals, finance, and labor in the production of plant and animal products. Activities include classroom instruction and laboratory experiences in and out of school, including farms, ranches, and other agricultural related establishments.
b. ____ Animal Science	2. Planned learning experiences which are concerned with the study and operations dealing with theories, principles, and practices involved in producing (breeding, feeding, care and housing) animals and animal products for economic and other uses.
c. ____ Agricultural Production	3. Planned learning experiences which are concerned with the study and operations dealing with principles and practices involved in the culture and production of agricultural plants.
d. ____ Plant Science	4. Planned learning activities which are concerned with farm resources, analysis, accounting, production, financing,

TEST

resource acquisition, purchasing, farm marketing, and maintenance. The results of those learning activities are applied to formulating decisions involved in managing a farm or ranch operation.

3. Discuss in a short paragraph ways to enter an agri-business and natural resources occupation of your choice.

4. What is one source from which you can determine the demand for occupations in agri-business and natural resources in Oklahoma?

5. Discuss in a short paragraph the education and experience needed for an occupation of your choice in agri-business and natural resources.

6. List three specific occupational clusters available within the general cluster of agricultural production.

   a. _____

   b. _____

   c. _____

7. List one specific occupation in each of the following agri-business and natural resources cluster.

Clusters	Specific Occupations
a. Animal Science	1.
b. Plant Science	2.
c. Farm Business Management	3.

AGRICULTURAL CAREERS
UNIT: OCCUPATIONAL CLUSTERS

ANSWERS TO TEST

1. a. 2
   b. 1

2. a. 3
   b. 2
   c. 4
   d. 1

3. Discussion should include the following:

   a. Self-employed
   b. Capital
   c. Credit
   d. Partnership
   e. Paid-employee
   f. Apprentice
   g. Part-time employment while in school

4. OTIS Report (Occupational Training Information System)

5. Discussion should include the following:

   a. Formal education
   b. Work experience
   c. Basic skills
   d. Supervised farm training programs

6. Any three of the following:

   a. Animal Science
   b. Plant Science
   c. Farm Mechanics
   d. Farm Business Management

7. One specific occupation should be selected from each of the agricultural production clusters. (Note: The instructor should use the information sheet supplement for the complete list and use it for checking.)

APPENDIX B

Agricultural Careers
General Test

1. Match the following terms to the correct definitions.

_____ a. The likes and dislikes a person has.

_____ b. The events, skills, and facts making up a person's past.

_____ c. What a person is able to do.

_____ d. The characteristics of a person which determine how he gets along with others.

_____ e. The way a person looks at himself.

1. Personality
2. Interest
3. Skills
4. Experience
5. Self-discovery

2. List six questions that you should ask yourself about your characteristics in looking at possible occupations.

a.

b.

c.

d.

e.

f.

3. Name a way to obtain experience for comparing occupations while in school.

4. Match the characteristics that represent a career-conscious student on the right to the areas on the left.

a. _____ Work task

1. A challenge, not always pleasant, but provides proof of ability.
2. Something to avoid, unpleasant associations.

b. _____ Education

1. Required, something to live through and get by.
2. Preparation for life, appreciation for learning.

c. _____ Work place	1. Where you put in time. 2. Opportunity to achieve, something to identify with.
d. _____ Self	1. Unique person, can control own destiny 2. Just a student, an object to be manipulated
e. _____ Teachers	1. Make decisions for you, someone to resist. 2. Equals with differing responsponsibilities.
f. _____ Peers	1. Interdependency, cooperate 2. Compete against, guard against

5. List the seven general occupational areas that are in the field or cluster for agri-business and natural resources.

   a.

   b.

   c.

   d.

   e.

   f.

   g.

6. List five important factors to consider about an occupation before making a decision to select it as an occupation in your career.

   a.

   b.

   c.

   d.

   e.

7. List the seven areas of instruction for the broad field of agriculture.

   a.

   b.

   c.

   d.

   e.

   f.

   g.

3

8. List three specific occupational clusters available within the general cluster of agricultural production.

   a.

   b.

   c.

9. Match the definitions of the instructional program with the correct general and/or specific agricultural production occupational cluster.

   a. _____ Farm Business Management

   b. _____ Animal Science

   c. _____ Agricultural Production

   d. _____ Plant Science

   1. Subject and learning activities which are concerned with the principles and processes involved in the planning related to and the economic use of facilities, land, water, machinery, chemicals, finance, and labor in the production of plant and animal products. Activities include classroom instruction and laboratory experiences in and out of school, including farms, ranches, and other agricultural related establishments.

   2. Planned learning experiences which are concerned with the study and operations dealing with theories, principles, and practices involved in producing (breeding, feeding, care, and housing) animals and animal products for economic and other uses.

   3. Planned learning experiences which are concerned with the study and operations dealing with principles and practices involved in the culture and production of agricultural plants.

   4. Planned learning activities which are concerned with farm resources, analysis, accounting, production, financing, resource acquisition, purchasing, farm marketing, and maintenance. The results of those learning activities are applied to formulating decisions involved in managing a farm or ranch operation.

10. What is one source from which you can determine the demand for occupations within agricultural supplies/services in Oklahoma?

    a. _____

11. List three specific occupational clusters available within the general occupational cluster of agriculturai supplies and services.

    a. _____

    b. _____

    c. _____

4

12. What is one source from which you can determine the demand for occupations within agricultural mechanics in Oklahoma?

    a. _____

13. List one specific occupation in each of the general and/or specific agricultural clusters.

Clusters	Specific Occupations
a. Agricultural Power and Machinery	1.
b. Water Management	2.

14. List three specific occupational clusters available within the general occupational cluster of agricultural products.

    a. _____

    b. _____

    c. _____

15. Match the definitions of the instructional programs on the right with the correct general and/or specific agricultural products occupational cluster on the left.

Clusters

a. _____ Agricultural Products

b. _____ Food Products

c. _____ Dairy Products

d. _____ Nonfood Products

Definitions

1. OE 01.0402 - A combination of subject matter and practical experiences concerned with information, scientific principles, processes, and marketing functions associated with nonfood products such as cotton, tobacco, and wool, as well as the industrial nonfood uses of grains and oilseeds.

2. OE 01.040102 - A combination of subject matter and practical experiences concerned with information, processes, science, and decisions associated with milk, and products derived from milk, e.g., cream, ice cream, butter and cheese.

3. OE 01.0400 - A combination of subject matter and learning experiences designed to track information, processes, scientific principles, and management decisions concerned with agricultural competencies in the food and non-food technology occupations. The groups of food products include (1) meat, fish, poultry, and eggs, (2) dairy products; (3) fruits and vegetables, (4) cereal grains, and (5) other foods and beverages. The nonfood products include cotton, tobacco,

and wool. Instruction may be provided in any or all of these products.

4. OE 01.0401 - A combination of subject matter and learning experiences concerned with the scientific principles and operations involved in the preparation of agricultural products for sale and consumption, including home and institutional preparation of food and its nutritive value.

16. List three specific occupational clusters available within the general occupational cluster of ornamental horticulture.

    a. _____

    b. _____

    c. _____

17. List one specific occupation in each of the general and/or specific ornamental horticulture clusters.

Clusters		Specific Occupations	
a.	Arboriculture	1.	_____
b.	Floriculture	2.	_____
c.	Greenhouse Operation and Management	3.	_____
d.	Landscaping	4.	_____

18. What is a source from which you can determine the demand for occupations within agricultural resources in Oklahoma?

    a. _____

19. List three specific occupational clusters available within the general occupational cluster of agricultural resources.

    a. _____

    b. _____

    c. _____

20. List three specific occupational clusters available within the general occupational cluster of forestry.

    a. _____

    b. _____

    c. _____

6

21. List three areas of responsibility accepted by the farmer.

    a. _____

    b. _____

    c. _____

22. List four areas of study taught in vocational agriculture that can aid you in becoming a farmer.

    a. _____

    b. _____

    c. _____

    d. _____

23. List four tasks the meat cutter must perform.

    a. _____

    b. _____

    c. _____

    d. _____

24. Draw a diagram which a high school student in vocational agriculture could follow to become a meat cutter.

25. Identify the school that offers training in agricultural mechanics.

    a. Elementary school

    b. Private school

    c. Vocational-technical school

26. Select from the following list the one that represents the approximate number of mechanics that will be needed in Oklahoma during 1972.

    a. 100 c. 150

    b. 170 d. 180

-7

27. List two areas taught in vocational agriculture that could aid a person to become a nurseryman.

    a. _____

    b. _____

28. List four personal traits which are desirable for a nurseryman to have.

    a. _____

    b. _____

    c. _____

    d. _____

29. What is the name of a school in Oklahoma where Forestry Technology is taught?

    a. _____

30. List four specific duties a forestry technician might perform.

    a. _____

    b. _____

    c. _____

    d. _____

31. List five duties of an agricultural sales clerk.

    a. _____

    b. _____

    c. _____

    d. _____

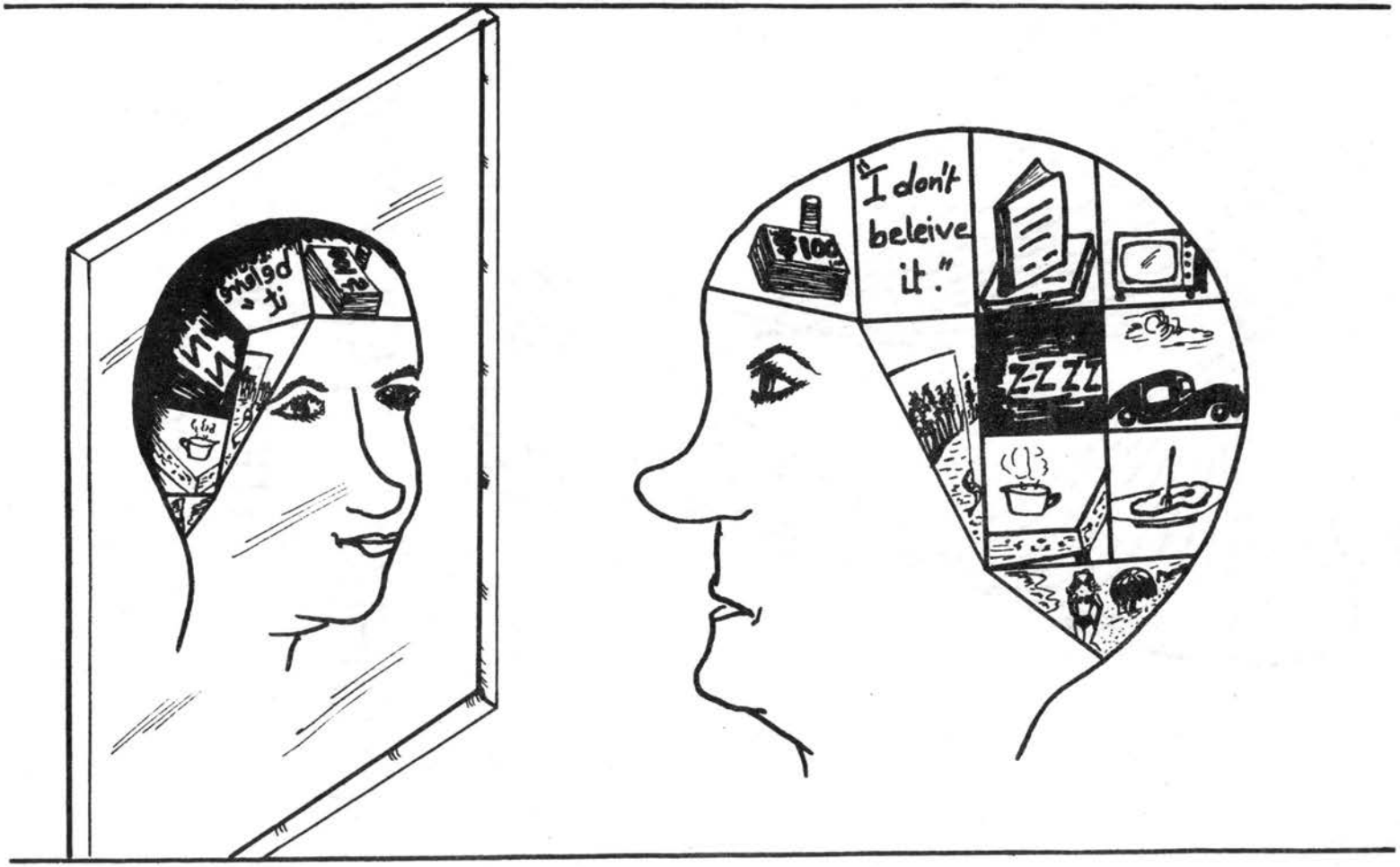
    e. _____

32. Develop the plan for becoming an agricultural sales clerk.

33. Define the term "trial period."

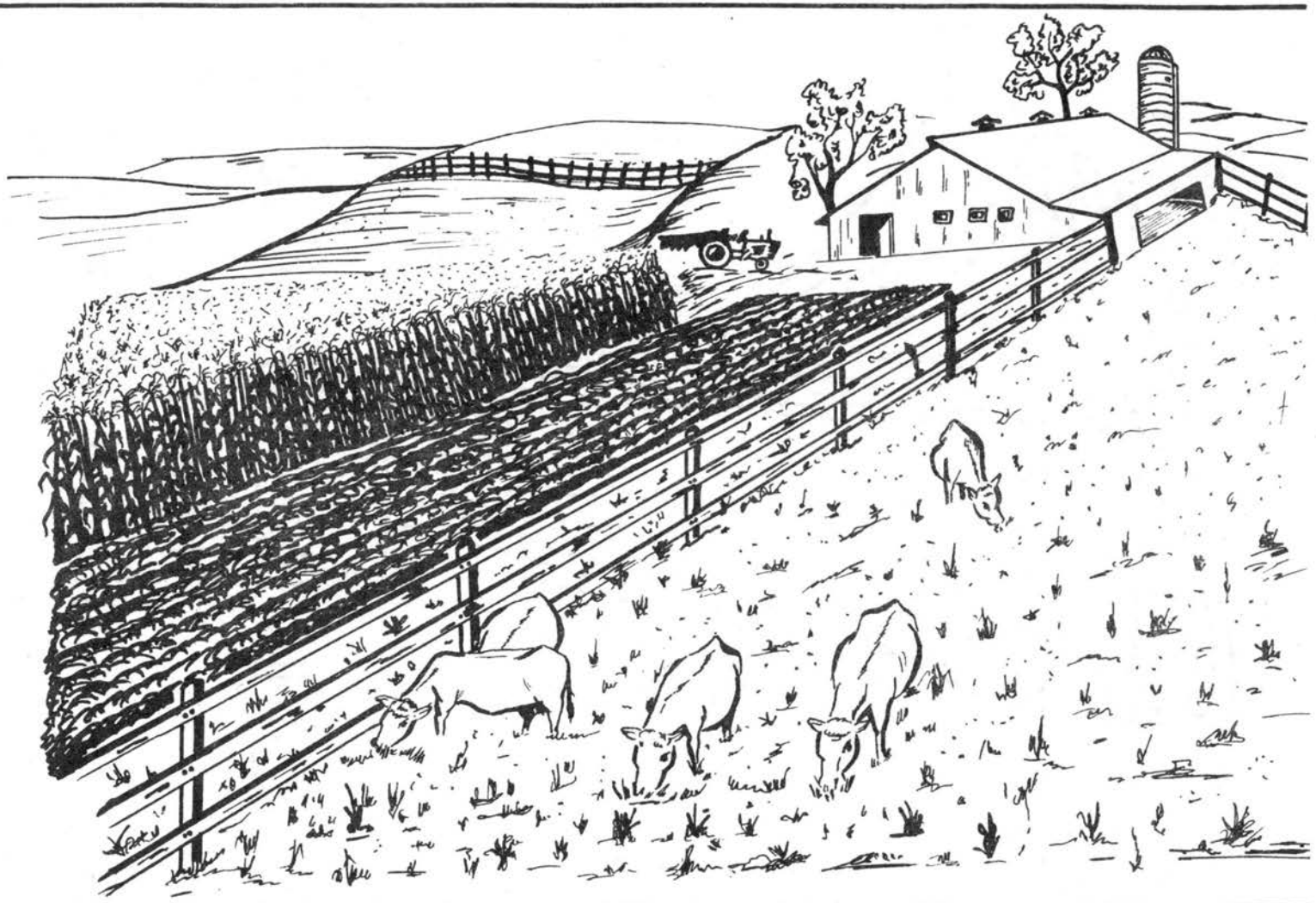
APPENDIX C

SELF DISCOVERY

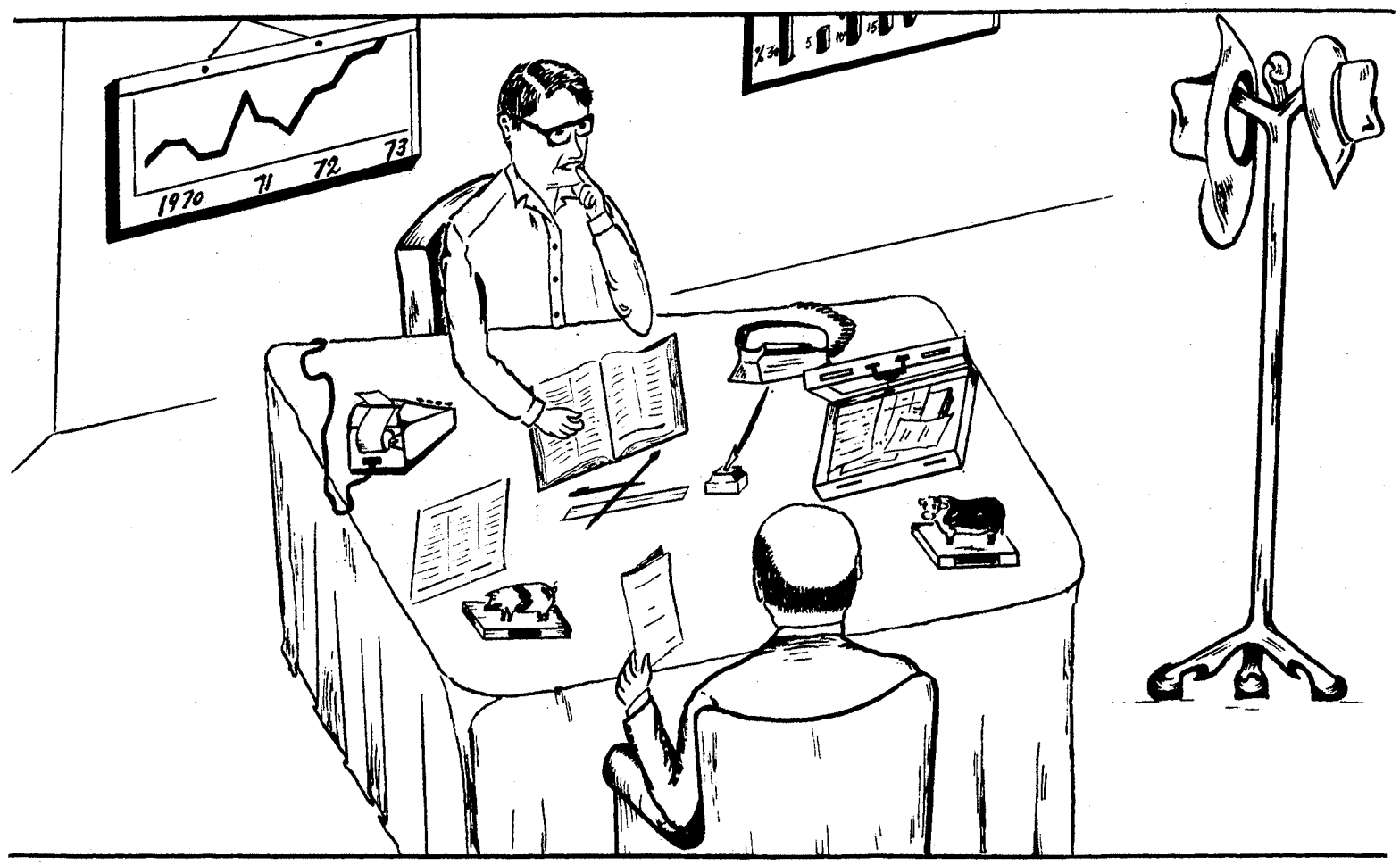


GENERAL OCCUPATIONAL CLUSTERS

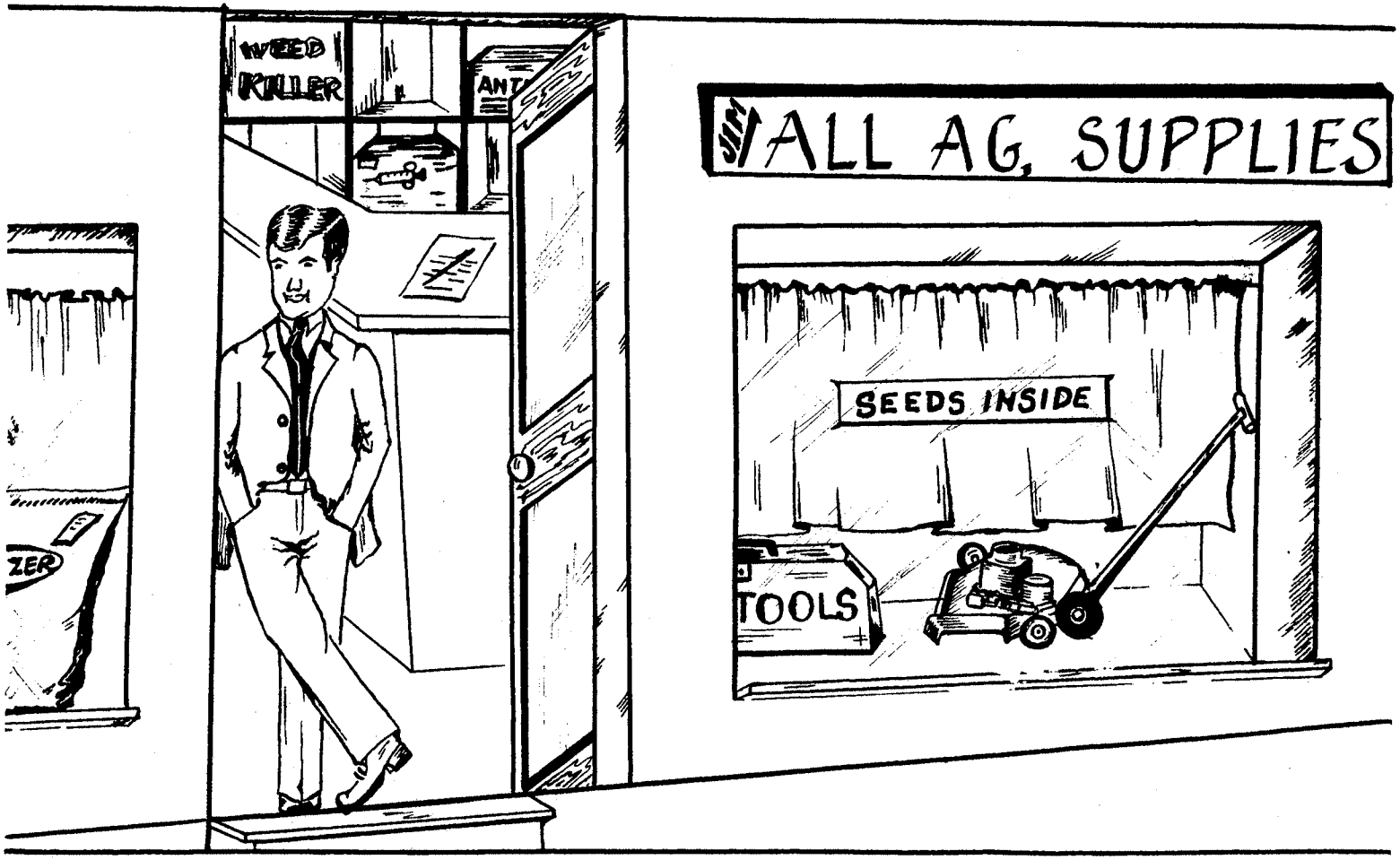
AGRICULTURAL OCCUPATIONAL CLUSTERS



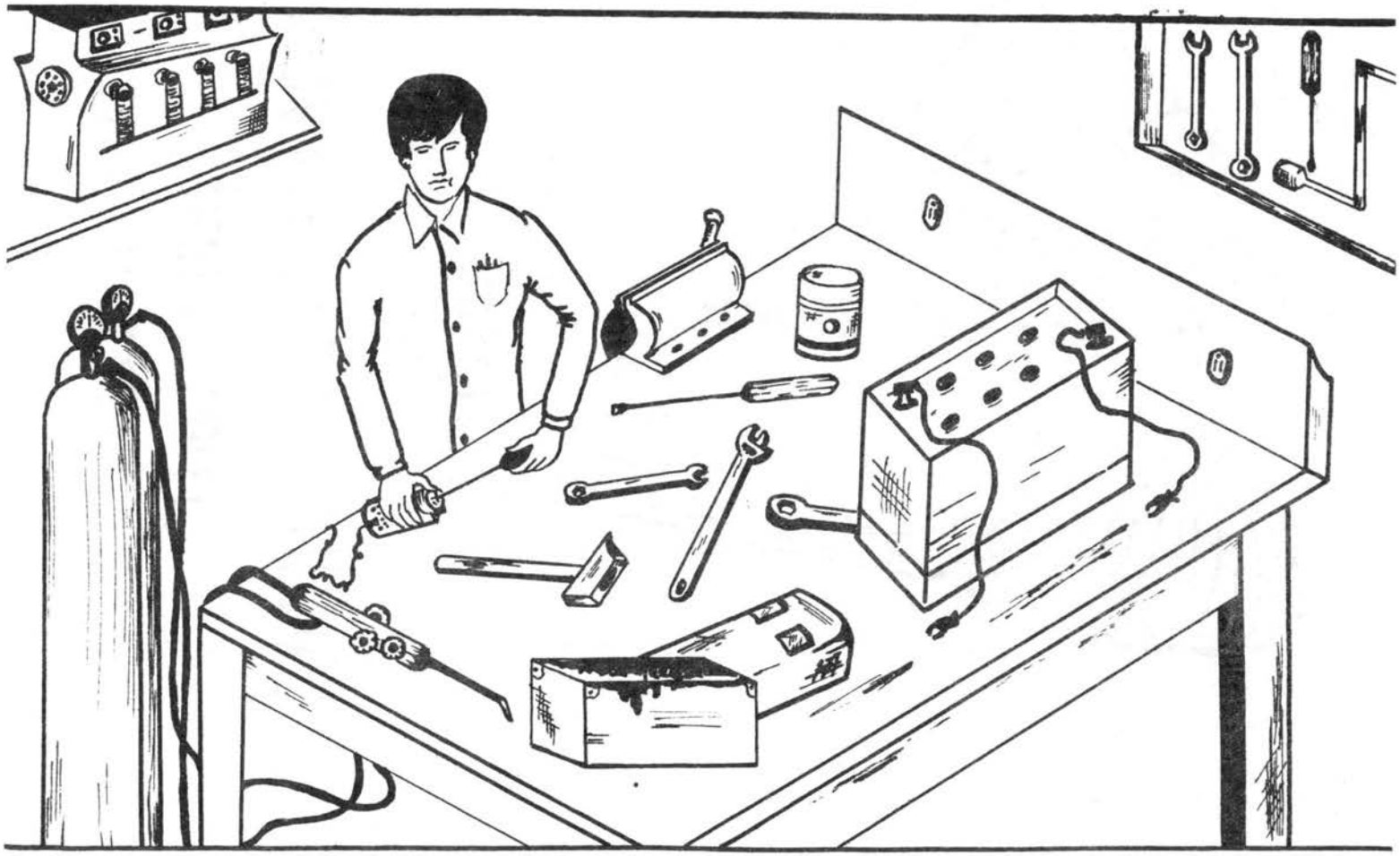
FARM MANAGEMENT



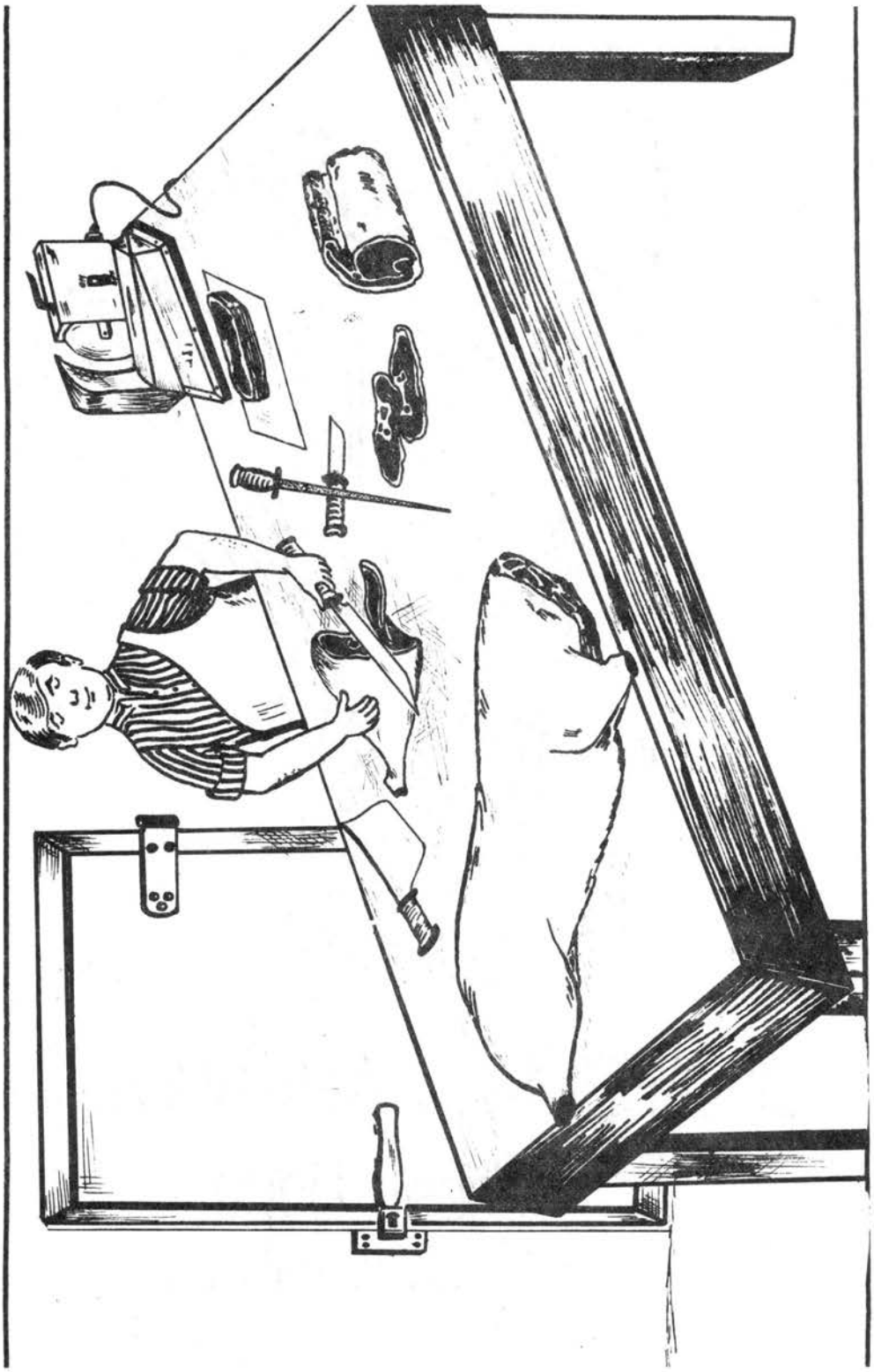
AGRICULTURAL SALES CLERK

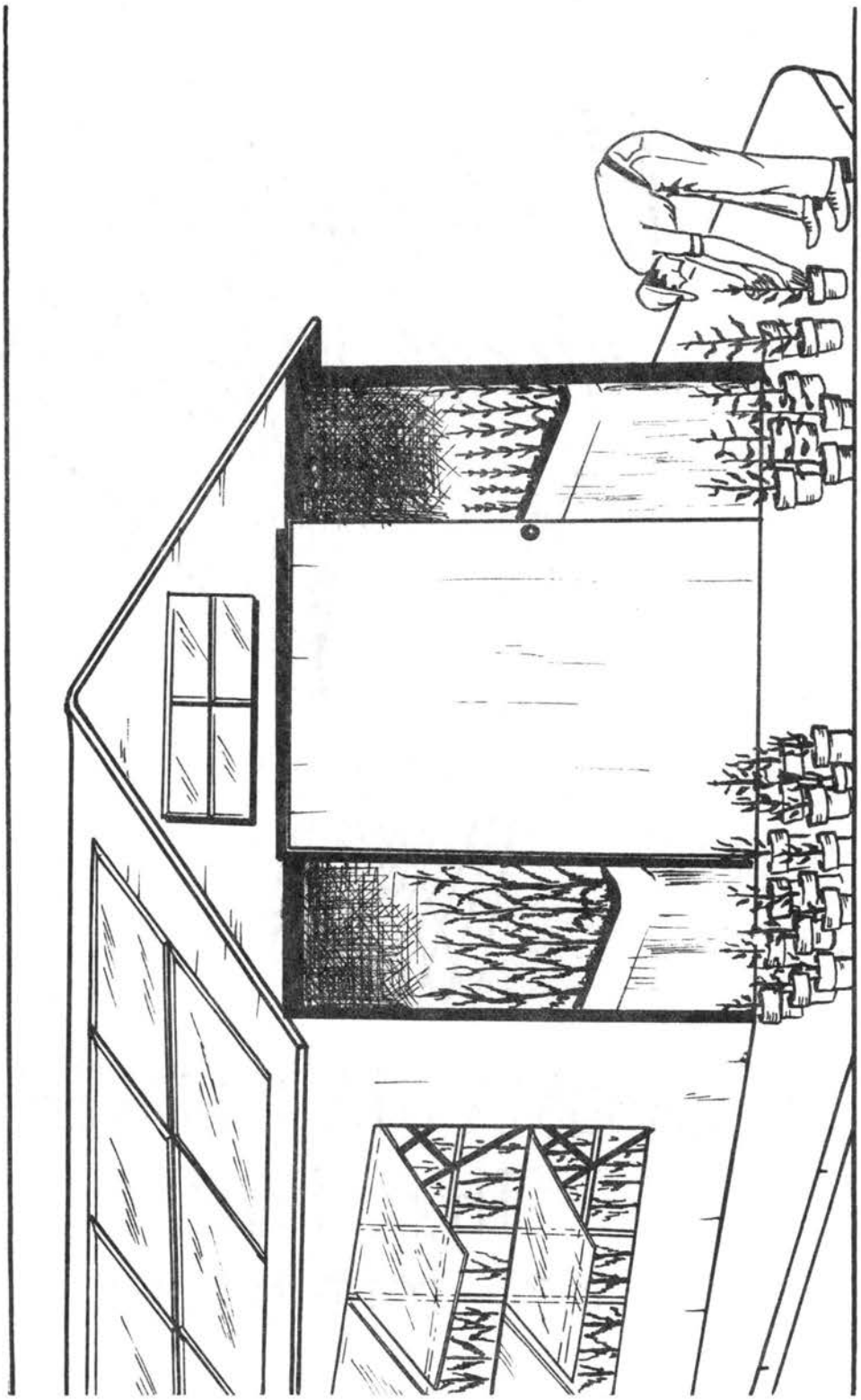


AGRICULTURAL MECHANICS

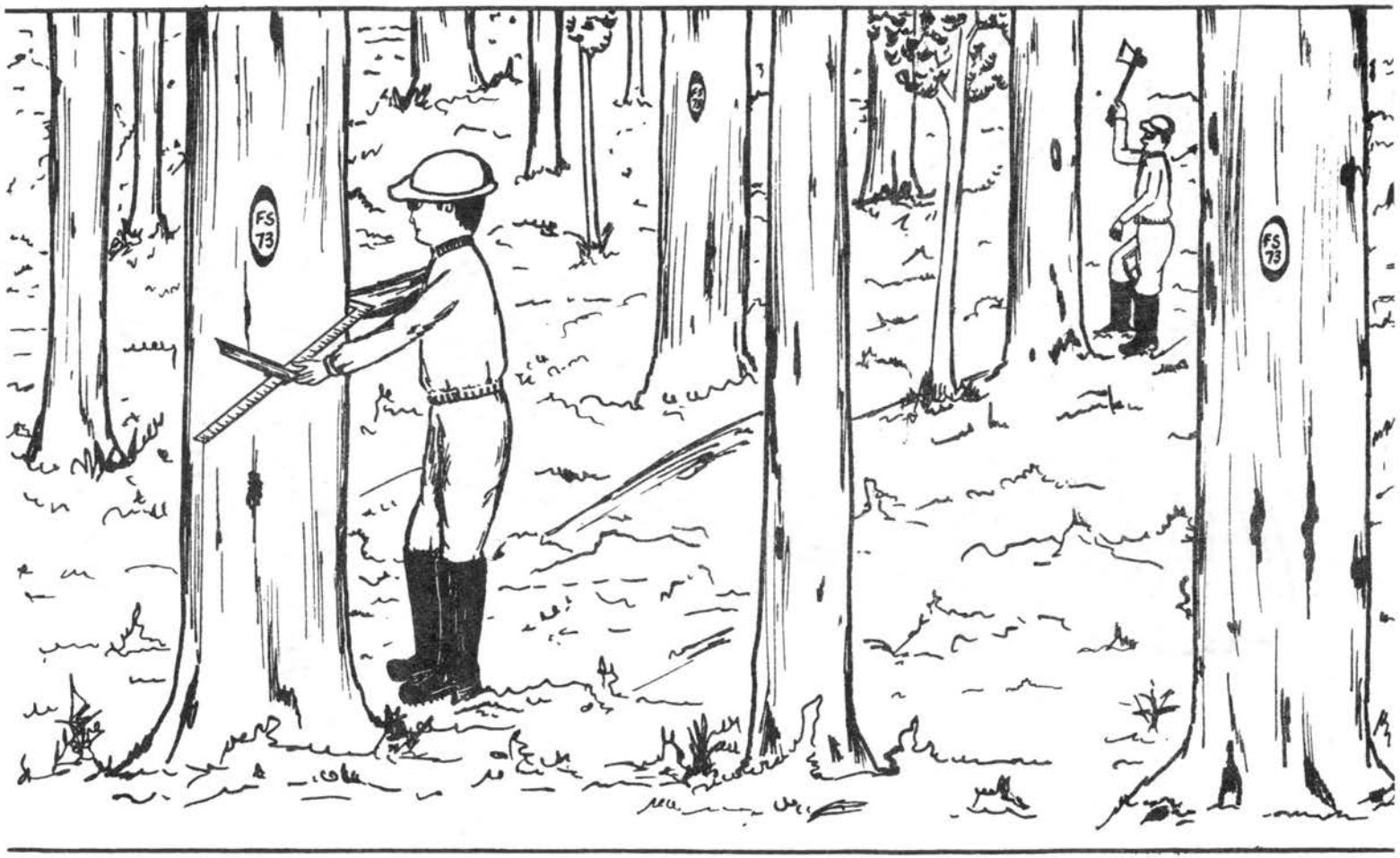


MEAT CUTTER

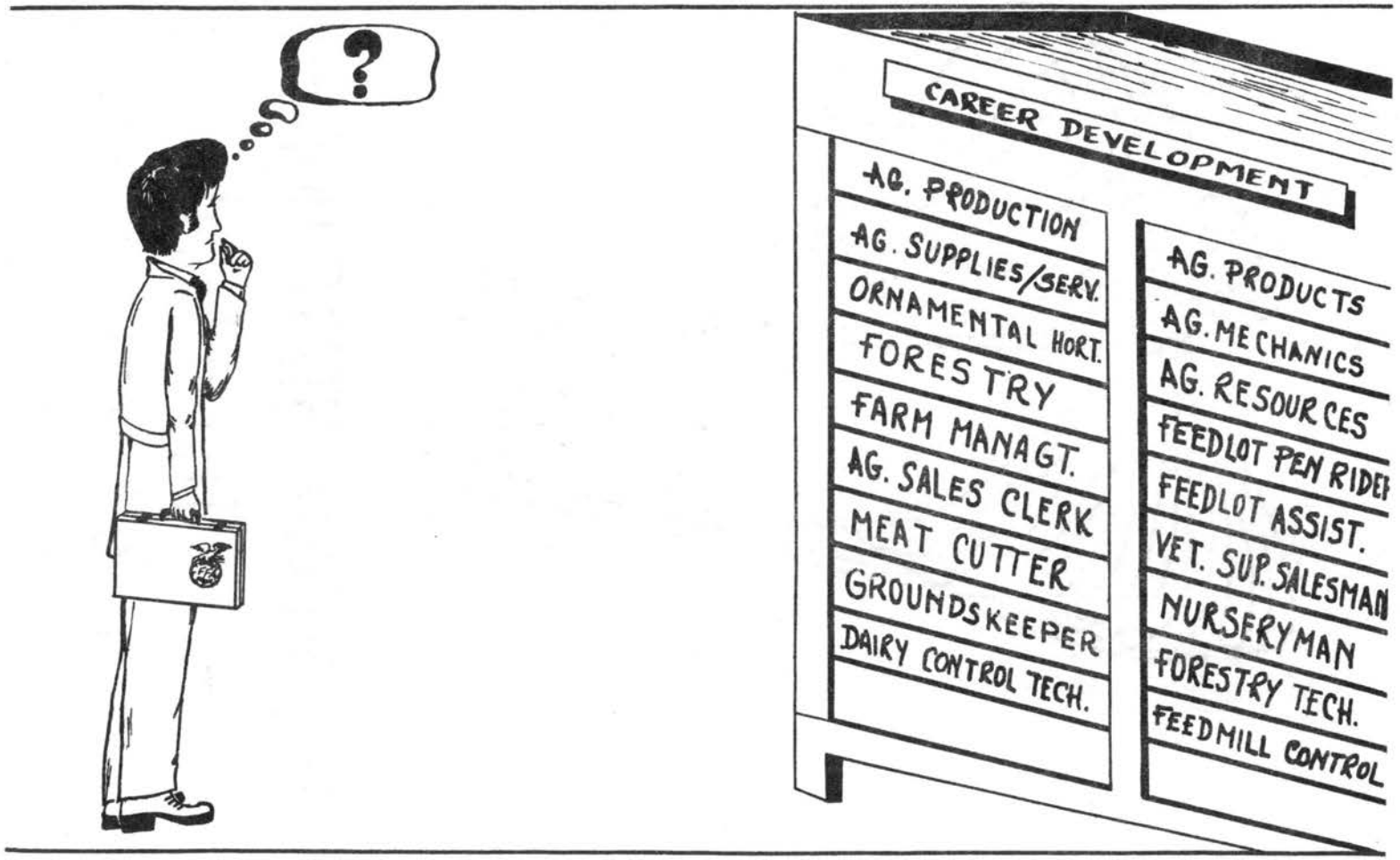



NURSERYMAN

FORESTRY TECHNICIAN



DECISION MAKING



VITA

Willis Otis Johnson

Candidate for the Degree of

Doctor of Education

Thesis: EVALUATION AND REVISION OF A CURRICULUM FOR AGRICULTURAL CAREER AWARENESS IN OKLAHOMA

Major Field: Agricultural Education

Biographical:

Personal Data: Born in Shattuck, Oklahoma, October 24, 1944, the son of I. E. and Beulah Johnson.

Education: Graduated from Arnett High School, Arnett, Oklahoma, in 1962; received the Bachelor of Science degree from Oklahoma State University in Agricultural Education in January, 1967; completed requirements for the Master of Science degree at Oklahoma State University in January, 1969; completed requirements for the Doctor of Education degree from Oklahoma State University in July, 1974.

Professional Experience: Graduate teaching assistant, Department of Horticulture, Oklahoma State University, 1967-1968; officer in the Army of the United States, 1968-1971; teacher of vocational agriculture, Paducah, Texas, 1971-1973; employed at Oklahoma State University as a graduate research assistant in the Agricultural Education Department, 1973-1974.

Professional Organizations: Member of Phi Delta Kappa, Alpha Tau Alpha, Oklahoma Vocational Agriculture Teachers' Association, National Vocational Agriculture Teachers' Association, Texas State Teachers' Association, and Texas Vocational Agriculture Teachers' Association.