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ABSTRACT

The guide is designed for use by agricultural instructors, administrators, supervisors, school boards, and others who are involved in planning instructional programs for vocational agriculture/agribusiness education in high schools and adult education. Part 1 details information pertaining to the administrative aspects of program development, management, and evaluation. It discusses content areas, supporting areas of instruction, adult education, multi-district programs, and total career education in agriculture, that will prepare individuals for job entry and upgrade their occupational training. The process of evaluating such a program is outlined in detail. Part 2, about three-fourths of the document, deals with instruction and outlines, instructional content areas, and supporting areas in agricultural production: animal science; agronomic science; agricultural business management, economics, and marketing; agricultural supplies/services; agricultural mechanics; agricultural products; ornamental horticulture; agricultural resources; supervised occupation experience; and Future Farmers of America. For each it gives a list of examples of performance objectives, occupational titles, and content outline. It also gives lengthy lists of bibliographic sources, references, and instructional aids. Suggested lists of facility and equipment specifications and a sample four year program in vocational agriculture are appended in detail. (Author/EC)

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## FOREWORD

This Program and Curriculum Guide for Vocational Agriculture/Agribusiness was developed under the direction of the Agricultural Education staff at South Dakota State University, in cooperation with the South Dakota Division of Vocational-Technical Education. Its development was funded through a sub-contract grant from EPDA. The interest and assistance on the part of E. B. Oleson, Director of Vocational-Technical Education, and L. A. Iverson, Supervisor, Teacher Education, Division of Vocational-Technical Education, are gratefully acknowledged.

The project grew out of a need to revise the Instructor's Guide for Teaching Vocational Agriculture in South Dakota, which was initially developed in 1950. Since that time, the total program in what currently is termed Vocational Agriculture/Agribusiness education has changed drastically, and it was felt necessary to develop a guide including two main parts: Part I, which details information pertaining to administrative aspects of program development, management, and evaluation; and Part II, which deals with instruction, including examples of performance objectives, occupational titles, content outlines, and source materials. Additional useful materials are found in the Appendix.

This guide is designed for use by instructors, administrators, supervisors, school board members, advisory council members, and others who are involved with programs of Vocational Agriculture/Agribusiness education.

## ACKNOWLEDGMENTS

Appreciation is expressed to the individuals who gave their time and knowledge to the preparation of this publication. This program and curriculum guide is the result of the pooling of knowledge and experience and much research in curriculum developments in other states, by the 14 men involved in the Curriculum Workshop held at South Dakota State University in July and August of 1974 under the leadership of Dr. H. W. Gadda, Supervisor of Teacher Education in Agriculture, South Dakota State University.

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## INTRODUCTION

The Program and Curriculum Guide for Vocational Education in Agriculture/Agribusiness in South Dakota was developed for use by administrators, school boards, and agriculture instructors in planning instructional programs to meet the needs of their students.

The program of Vocational Agricultural/Agribusiness is concerned with all the people in the school area who have an interest in agriculture. A complete program provides for well planned and closely integrated action in the following areas:

1. A complete program of instruction in agriculture for high school students.
2. Day and evening school work in adult agricultural education programs.

The Vocational Agriculture/Agribusiness program provides an opportunity for the school to spread its influence in every home of the school patronage area.

Agriculture is the basic industry in the State of South Dakota. Vocational Agriculture/Agribusiness programs designed to meet the occupational needs of this industry are certainly an asset to every South Dakota community.

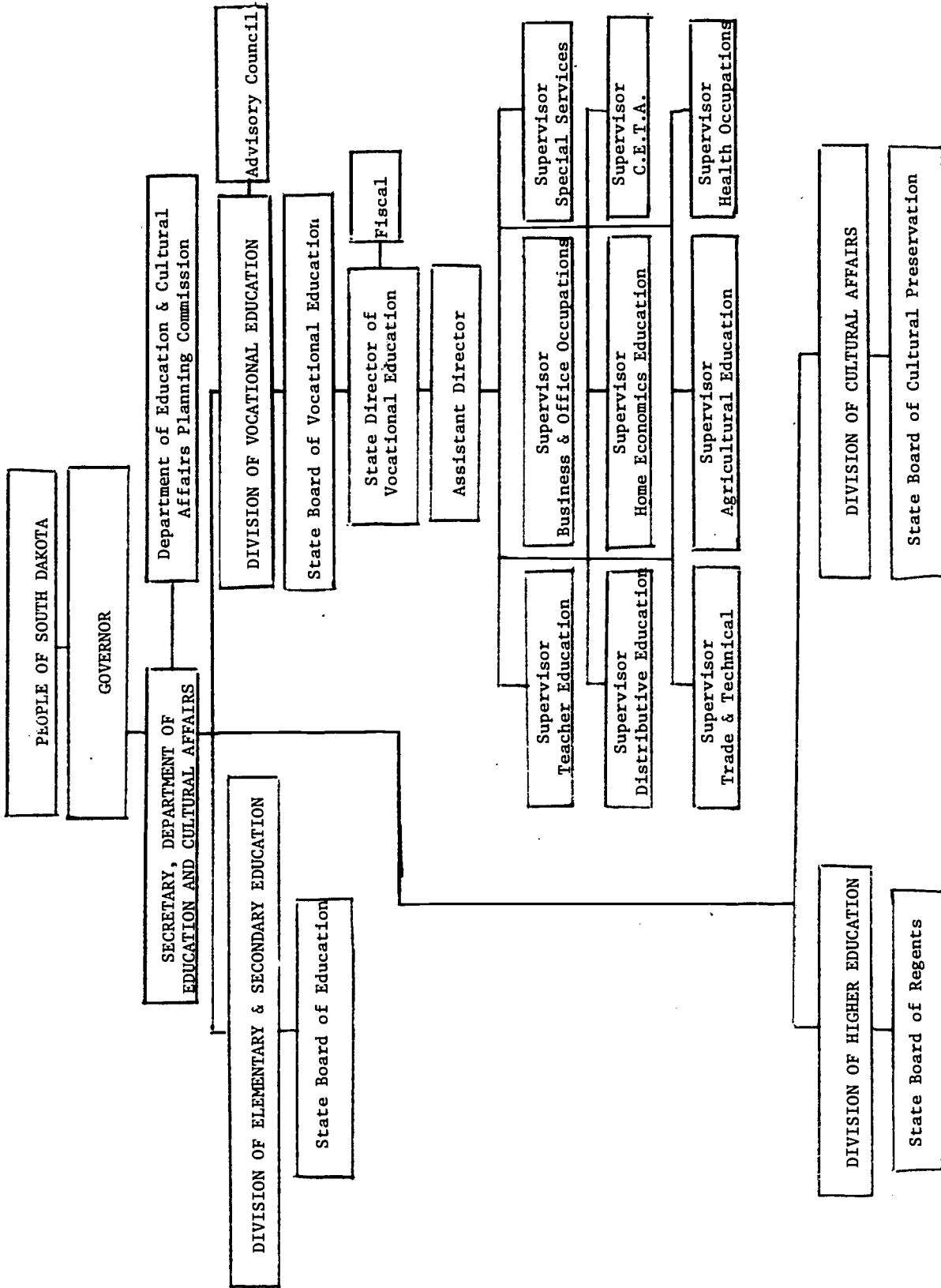
### MAJOR PROGRAM OBJECTIVES FOR VOCATIONAL AND TECHNICAL EDUCATION IN AGRICULTURE

1. To develop agricultural competencies needed by individuals engaged in or preparing to engage in production agriculture.
2. To develop agricultural competencies needed by individuals engaged in or preparing to engage in agricultural occupations other than production agriculture.
3. To develop an understanding and appreciation of the career opportunities in agriculture and of the preparation needed to enter and progress in agricultural occupations.

5. To develop those human relations skills and attitudes required for success in an agricultural occupation.
6. To further develop leadership abilities and civic responsibilities.



# SOUTH DAKOTA DEPARTMENT OF EDUCATION AND CULTURAL AFFAIRS



PART I

PROGRAM DEVELOPMENT, MANAGEMENT, AND EVALUATION

## PROGRAM DEVELOPMENT

### INAUGURATING THE VOCATIONAL AGRICULTURE/AGRIBUSINESS PROGRAM

The following steps can be used for inaugurating a Vocational Agriculture/Agribusiness program:

1. Ascertain needs for the program.
2. Promotion of program in community.
3. Invite consultant from Agricultural Education State Supervisory Staff to provide approval for a program.
4. Obtain approval from Division of Vocational Education.
5. Procure facilities, teacher(s) and enrollment.
6. Develop curriculum and course of study for the program.

### SECONDARY INSTRUCTION IN AGRICULTURE

Instructional program in Vocational Agriculture/Agribusiness will prepare individuals for job entry, will upgrade occupational skills or will prepare the learner for further occupational training.

### THE CONTENT AREAS OF INSTRUCTION

The Agricultural Instructional programs related to occupations as classified and coded by the U.S. Office of Education with their code are:

1. Code 01.01 Agricultural Production.  
This deals with the subject matter and learning activities concerned with all aspects of production - land, water, machinery, labor, finances, etc.
2. Code 01.02 Agricultural Supplies/Services.  
This area deals with the subject matter and learning experiences concerned with occupations included in preparing students for occupations providing consumable supplies and services used in the production phase of agriculture.
3. Code 01.03 Agricultural Mechanics.  
The subject matter and activities are designed to develop abilities in selection, operation, maintenance and use of agricultural power, machinery, equipment, buildings, etc.

4. Code 01.04 Agricultural Products.  
The subject matter and learning experiences are concerned with the scientific principles and operation in the preparation of agricultural products for sale and consumption.
5. Code 01.05 Ornamental Horticulture. (Production, Processing, Marketing and Services)  
The organized subject matter and practical experiences are concerned with the culture of plants used principally for ornamental or esthetic purposes.
6. Code 01.06 Agricultural Resources. (Conservation, Utilization and Services)  
The subject matter and planned learning experiences are concerned with the principles and processes involved in the conservation and/or improvement of natural resources such as air, forests, soil, water, fish, plants and wildlife.
7. Code 01.07 Forestry. (Production, Processing, Management, Marketing and Services).  
The subject matter and experiences are concerned with the multiple use of forest lands and resources including their management and protection.

#### SUPPORTING AREAS OF INSTRUCTION

##### A. Supervised Occupational Experience Programs

The aim of Vocational Agriculture/Agribusiness education is to prepare individuals for any agricultural occupation in which knowledge and skill in agricultural subjects is involved. Knowledge and skill in production agriculture are basic and fundamental in many agricultural occupations. A large number of Vocational Agriculture/Agribusiness students continue to develop occupational experience in a comprehensive supervised farming program. The tradition of the student "learning by doing" still continues to receive emphasis. However, changes in agricultural employment and education require a revision in the occupational experience program to include off-farm agriculture on-the-job training. These facts, along with the South Dakota state plan for vocational

education, set forth a program of both on-and off-farm agricultural occupational training.

Students completing instruction in the occupational experience program will have strengthened their interests in agricultural occupations and have developed abilities to (1) analyze the contribution of agriculture to the economy of the community, state, and nation; (2) analyze their future employment in an agricultural occupation; (3) secure employment in an agricultural occupation; and (4) have acquired the practical experience necessary for successful performance in an agricultural occupation.

#### B. The Future Farmers of America

The local chapter of the Future Farmers of America has become one of the best forces in the community for developing an attitude of good will, not only for the Agriculture Department but for the entire school. Membership consists of the students enrolled in Vocational Agriculture/Agribusiness at the secondary level. They may continue their active membership for three years beyond graduation from high school. There are many opportunities for developing leadership, for community service, citizenship, training, cooperation and recreation. The many activities growing out of the Future Farmers of America serve as excellent news and publicity material which can help create a good public relations attitude in the community.

#### ADULT EDUCATION IN AGRICULTURE

The modern school does not confine itself to purely academic training; it does not limit itself to serving youth from kindergarten through

high school; the school must be concerned with the activities of the family, community, state and the world. The State Plan for Vocational Education states that a complete program in Vocational Agriculture/Agribusiness in the secondary school includes educational activities to meet the needs of agriculturally oriented adults.

There is a need for providing a broad range of educational opportunities in agriculture for all persons beyond the secondary level who are interested in and who will benefit from them. Courses for adults shall be designed to provide knowledge and help them gain proficiency in agricultural practices.

#### MULTI-DISTRICT PROGRAMS IN AGRICULTURE

The multi-district concept for Vocational Education in South Dakota is making vocational training available to many high school students who previously did not have that opportunity. Students from several school districts are bussed to a vocational training center for two hours a day, while remaining enrolled in their home school for basic required courses. By pooling resources, training is made available in specialized areas which can not be offered to a limited number of students on the local level due to the high cost of equipment and facilities.

A school day is divided into three blocks of time - typically 8:30 to 10:15; 10:15 to 12:00 and 1:15 to 3:00. Students from the central school make up all of Block I due to the fact that the outlying schools must take time to be transported to the Career Center.

Vocational Agriculture/Agribusiness can be offered to many students who otherwise would not have this opportunity. It does present some special problems in that in many areas strong four year programs in

in Vocational Agriculture/Agribusiness are already being offered on a four year grade level of 9-12. It is not recommended that this program be discontinued in favor of a one year, or at best, two year program of Vocational Agriculture/Agribusiness in a Career Center.

There are at least three kinds of situations to be considered for offering Vocational Agriculture/Agribusiness in a Multi-District Career Center.

First, if no Vocational Agriculture/Agribusiness training is offered in the area the ideal plan is a two year program enrolling up to 120 students and being staffed by two teachers. This will allow for growth in occupational training and supervised farming programs for at least two years. Leadership training opportunities are much greater and the curriculum offered can be as broad as a full four-year course.

If approximately sixty students can be enrolled (twenty per class) it is still possible to cover quite a broad curriculum by rotating the course offerings every other year under one teacher.

If a one year curriculum is offered the opportunities for growth in supervised farming are very limited and the time for development and participation in leadership and FFA activities is also limited. It becomes a nine months program.

When there are one or more four year programs in Vocational Agriculture/Agribusiness within the Multi-district area it is recommended that they continue to operate and that those schools who do not have departments make up the Career Center departments. This requires special consideration when it comes to financing, organization and scheduling. Each district must study its own situation as to how best to accomplish this.

A third alternative is to offer specialized training in areas not presently being offered by existing Vocational Agriculture/Agribusiness departments to supplement existing programs and yet offer training to those students who have had no training.

#### TOTAL CAREER EDUCATION IN AGRICULTURE

A basic purpose of American Education is the preparation of people for a living and preparation of people for a career. Career Education is the development of attitudes and appreciations toward workers and the benefits each worker receives and gives as a contributing member of society. Career Education can be the focal point for developing an educational awareness of the use of skills and knowledge taught in the schools and used by adults in the working world. Career Education can be the center of the curriculum which joins school, family, and community into a joint effort of educating the young. Career Education is concerned with the total development of a student. This means providing experiences for students to conceptualize the career development concepts which should be introduced to pre-schoolers and developed through high school.

Career development, which is a lifelong process, begins at a very early age when the child role plays various occupations in his play. The child goes through the following stages:

The Awareness Stage, which covers the period through grade six, is a period when the child not only becomes aware of himself and other people physically, emotionally and socially, but he also gains intellectual skills and knowledge.



The Exploration Stage, which usually covers the middle or junior high school level, is a time for some actual exploring of a variety of occupations. It is a time of self-assessment and of consideration of the various types of careers available to the individual.

A tentative decision may be made by grade nine in order to begin the Preparation Stage. This Stage will last as long as necessary for the acquisition of skills and knowledge needed to enter and progress through one's occupational career.

The vocational education phase of career education begins when the student has made at least a tentative career choice. In other words, the vocational education component of career education provides specialized preparation for the student's chosen occupation. The Vocational Agriculture/Agribusiness teacher should provide leadership or assistance in implementing the total career education concept regarding agriculture in the school.

Career Education, then, is the education of a child of today in a manner which will make his life useful and productive in the world he will live in tomorrow.

## PROGRAM MANAGEMENT

The operation of a Vocational Agriculture/Agribusiness department is a complex, dynamic undertaking and success will not be attained by chance.

The basic difference between a Vocational Agriculture/Agribusiness instructor and a non-vocational instructor is that the Vocational Agriculture/Agribusiness instructor is responsible for a complete program, whereas the non-vocational instructor is responsible for teaching classes.

One attribute a Vocational Agriculture/Agribusiness instructor must have is that of being able to plan his work, suitably put his plan into operation and finally evaluate his executed plans.

In this publication an effort is made to briefly outline the management of a total program.

PROVIDING AND USING FACILITIES, EQUIPMENT, SUPPLIES AND TEACHER AIDS

Each school will provide the facilities needed for an adequate instructional program. These needs will vary according to the number of students, the type of instruction to be followed, and the number and kind of agricultural occupations in which training is being given.

The State Supervisor of Agricultural Education has developed a guideline set of recommendations and requirements concerning facilities, equipment, supplies and teaching aids (See Appendix A and B). The consultant services of the Division of Vocational Education are available for assisting communities in determining their needs. An example of government regulated equipment is included on the next page.

## FORTY-FOURTH SESSION OF THE LEGISLATURE OF THE

## STATE OF SOUTH DAKOTA

## Chapter 61 (H.B. 607)

REQUIRING PROTECTIVE EYE DEVICES FOR PUPILS AND TEACHERS  
IN CERTAIN COURSES OF INSTRUCTION

AN ACT Entitled, An Act to require certain elementary and secondary schools within the state to supply protective eye devices to pupils and teachers participating in certain courses and to require pupils and teachers desiring protective-corrective eye devices to secure such devices at their own expense.

BE IT ENACTED BY THE LEGISLATURE OF THE STATE OF SOUTH DAKOTA:

Section 1. Every pupil and teacher in any elementary or secondary school with this state, public, private, or parochial, participating in any of the following:

- (a) Vocational or industrial arts shops or laboratories involving use of or exposure to: (1) hot metals; (2) milling, sawing, turning, shaping, cutting, or stamping of any solid materials; (3) heat treating, tempering, or kiln firing of any kind of any metal or other materials; (4) gas or electric arc welding; (5) repair or servicing of any vehicle; (6) caustic or explosive materials;
- (b) Chemical or combined chemical physical laboratories involving caustic or explosive chemical or hot liquids or solids;

is required to wear industrial quality eye protective devices at all times while observing or engaging in any such activities. The school board of each such public school district and the appropriate school administrators of such parochial or private schools shall purchase and cause such industrial quality protective eye devices to be placed in such public, parochial, or private schools for the eye protection of pupils, teachers and visitors to such classrooms or laboratories.

Section 2. Any person desiring industrial quality eye protective devices other than those supplied by the school board or administrators shall at his own expense procure and equip himself with such industrial quality eye protective devices.

Section 3. "Industrial quality eye protective devices," as used in this Act means devices meeting the standards of the USA Standard Practice of Occupational and Educational Eye and Face Protection, Z87.1-1968, and subsequent revisions thereof, approved by the United States of America Standards Institute, Incorporated.

Approved March 13, 1969.

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TIME ALLOCATION FOR CLASS PREPARATION, TEACHING, SUPERVISION, AND PROGRAM MANAGEMENT

It is important to emphasize the fact that the teaching activities of an agriculture instructor carry him far beyond the walls of the classroom in the performance of his duties. This fact has a special significance in calculating the teaching load of agriculture instructors. Some of the factors having a bearing on the teaching load of the agriculture instructor and the personnel needed to conduct a complete program are:

1. The size and scope of high school agricultural programs, including classroom instruction, FFA program of work, and supervised occupational experience program.
2. The scope of the adult education program.
3. School-community coordination and service activities. Specifically, vocational agriculture is concerned with:
  - a. secondary school youth
  - b. out of school youth
  - c. adults who need training to make entry into agricultural employment or upgrade their occupational performance.

The local school should feel an obligation to train for the whole agricultural industry and not just for production agriculture. It is the role of the Vocational Agriculture/Agribusiness department in the community, in addition to its function in rural education, to serve those people of the community in the business phase of agriculture.

LOCAL POLICIES FOR OPERATION OF COOPERATIVE OCCUPATIONAL EXPERIENCE PROGRAMS

An important part of the Vocational Agriculture/Agribusiness program is the occupational experience programs carried on by the students. Examples of occupational experience programs would be

livestock and farming projects carried out on the student's home farm, placement for farm experience, and placement for off-farm agriculture related training.

Under the Vocational Education Act of 1963 and amendments of 1968, training for off-farm agricultural occupations has become an important part of the Vocational Agriculture/Agribusiness program. This work is designed for students who are interested in agriculture and have received training in Vocational Agriculture/Agribusiness work. (It is recommended that two years of regular Vocational Agriculture/Agribusiness course work precede this training so that the students will be equipped to participate in these related occupations.) A minimum of 300 hours of on-the-job training in the occupational field is considered essential for proper training. The work experience will be secured through the cooperation of various agricultural businesses in the community and their related course work will be conducted by the Vocational Agriculture/Agribusiness instructor and such consultants as may be used under the direction of the Vocational Agriculture/Agribusiness instructor.

It is important that the experience program be established in such a way that the student is participating in a well-planned, coordinated, and educational program that will benefit the student in his study of the field of agriculture. The instructor participates in this process through related classroom instruction and on-farm or on-job supervision of the students activities.

Additional information on off-farm programs can be found in the publication "Guidelines for Establishing Off-Farm Agricultural Experience Programs in Vocational Agriculture in South Dakota."

### ORGANIZING AND CONDUCTING ADULT EDUCATION IN AGRICULTURE

The local Vocational Agriculture/Agribusiness instructor upon determining the needs of the local community or individuals in that community should establish a program of adult education to meet these needs.

Presently, three methods of instruction are commonly used. One method is the individualized program of farm management. This method involves instructor participation with farm families in maintaining an Adult Farm Business Management program and in providing advice in making management decisions. The second method involves instruction in farm mechanics and the third, instruction in areas of productive enterprises. In many cases the second and third areas may be combined to meet local needs.

It is important that the Vocational Agriculture/Agribusiness instructor develop an organized, comprehensive program and that the use of outside personnel as speakers/instructors be held to a minimum.

### PARTICIPATION IN LEADERSHIP OF THE AGRICULTURAL COMMUNITY

The Vocational Agriculture/Agribusiness instructor occupies a unique position of leadership in his community. As the director of the agricultural education program for high school and adults operating throughout the calendar year, rather than the traditional nine-month academic year, he has an unusual opportunity for effective community leadership. The very nature of the curriculum requires that he carry his instruction on to the farms and in cooperation with the agricultural business firms of his high school area. This affords him the opportunity to put the school-community philosophy into action. He can very

effectively function as a coordinator of rural and urban relations. No other faculty member has as advantageous a position of serving the whole community and of securing the complete cooperation of students, parents, farmers, businessmen, and community organizations as has an effective teacher of Vocational Agriculture/Agribusiness. If his department is to flourish he cannot afford to be less than a full-time citizen of the community, taking part in school and community activities and organizations. As soon as possible he must become well acquainted with farm people, local business people, and various organizations of business and farm people. He might serve on the agricultural committee of the local Chamber of Commerce or he may become active in a service club.

The Vocational Agriculture/Agribusiness instructor's role as a teacher, counselor, and advisor to farm people, old and young, makes his work of connecting the farm, the school, and the city an adventure in community building.

#### DETERMINING COMMUNITY AND INDIVIDUAL NEEDS

The dependence on close working relationships between home and school and between parents, teacher, and student is a unique characteristic of agricultural education. All those responsible for program development in agriculture at the community level - school administrators, teachers, supervisors, teacher educators, school board members, and those serving on advisory councils - take cognizance of the basic need for coordination of all available resources.

A significant responsibility of a Vocational Agriculture/Agribusiness instructor is the community survey. It involves the identification of all farm and non-farm agricultural occupations and

businesses in the school service area. It can be assumed that, until the personnel of a Vocational Agriculture/Agribusiness department have made personal contact with the people involved in the agricultural businesses and occupations in a community, the insights and understanding of community needs in agricultural education are incomplete.

The community survey provides a picture of the human and physical resources that make up the complex of South Dakota's agricultural industry.

#### KEEPING DEPARTMENTAL RECORDS AND MAKING REPORTS

The nature of the Vocational Agriculture/Agribusiness program in relation to state funding requires the submission of reports to the State Office of Vocational Education. The State Supervisor will provide each department with the required report forms. It is the responsibility of the Vocational Agriculture/Agribusiness instructor to insure the accurate and timely submission of reports to the State Office. This will insure the proper reimbursement to the school district and help the State Office to more adequately provide for the Vocational Agriculture/Agribusiness programs of the state.

#### PROFESSIONALISM AND PERSONAL RELATIONSHIPS WITHIN THE SCHOOL AND COMMUNITY

The Vocational Agriculture/Agribusiness instructor himself is the most important factor in the development of an effective program in the community. His personality, integrity, and judgment, his unselfish devotion to his responsibility, and his ability to get along with people are essential in developing and maintaining the standards of education in agriculture.



The Vocational Agriculture/Agribusiness instructor must recognize his role as a member of the local staff as well as exhibiting high ethical standards in the community. Indeed a continued effort to attain more formal and informal training in agriculture through attendance at in-service workshops, college classes, field days, reading agricultural publications and writing for publication is vital to the educational and professional growth of the progressive Vocational Agriculture/Agribusiness instructor.

Active participation in local, state, and national professional organizations is also suggested for the instructor.

#### THE SUMMER PROGRAM

Because of the nature of the Vocational Agriculture/Agribusiness program it is recommended that the instructor be hired on a 12 month basis. The summer months are of extreme value to a truly vocational program in agriculture. Most of the work in production agriculture is done during the summer months, therefore, it is only natural that the summer months be an opportune time to make supervisory visits that are a part of the total program. The summer months also offer an opportunity for the instructor to organize course content and purchase needed materials for the next school year. Because of the broad nature of the field of agriculture, it is important that the instructor continually strive to stay abreast of new developments. The summer months offer excellent opportunities to do this.

It is important that the Vocational Agriculture/Agribusiness instructor visit prospective students of Vocational Agriculture/Agribusiness, to explain the program offerings to the student and his or

her parents, so that they understand the aims and purposes of the Vocational Agriculture/Agribusiness program, and are able to make wise decisions concerning their education for the future.

The summer period also provides opportunity to conduct related instruction and occupational experience in off-farm agricultural occupations.

It is the responsibility of the Vocational Agriculture/Agribusiness instructor to keep the school administration and Board of Education informed as to his plans and accomplishments during the summer months.

It is suggested that the instructor furnish the school administration with a schedule of planned activities for the coming week and a follow-up list of accomplishments during the week.

#### LOCATING SOURCES OF PROGRAM MATERIALS AND INSTRUCTIONAL AIDS

The numbers of educational materials available to the Vocational Agriculture/Agribusiness instructor are almost limitless. Source materials are cited at the end of each part of Part II. An instructor searching for specific materials should contact the State Agricultural Education Office, the Teacher Training Department for Agriculture at the State University, the Agricultural Extension Service, or commercial concerns involved in the specific area for which material is being sought.

The local instructor should insure that his source material is available well in advance of the time it will actually be used.

#### MANAGING A MULTIPLE TEACHER DEPARTMENT

Much time is required in visiting students placed for occupational training in a Cooperative Off-Farm Agriculture Occupations program and

Supervised Farming program. Similarly, a Farm Management program in adult education is centered around on-farm instruction with the individual farm couples. Because the nature of instruction in Vocational Agriculture/Agribusiness is different in many ways from that of most other courses taught in South Dakota secondary schools, it is apparent that the traditional method of calculating teacher load by including only regularly enrolled high school students violates the community-school philosophy and is a handicap to a truly functional educational program.

When determining the teaching load of the Vocational Agriculture/Agribusiness instructor, consideration should be given to the type of instruction carried out in the local Vocational Agriculture/Agribusiness department. As a suggested guideline, it is recommended that a Vocational Agriculture/Agribusiness department with more than 65 students be considered a teaching load of sufficient nature to require two Vocational Agriculture/Agribusiness instructors.

In hiring and managing personnel for a multiple teacher Vocational Agriculture/Agribusiness department, it is recommended that the school consider the strengths of each instructor, and assign the teaching load in such a manner that the talents of each instructor be used to maximum advantage in strengthening the Vocational Agriculture/Agribusiness department.

It is recommended that in a multiple teacher department, a structure be recognized whereby one individual is recognized as the department head.

### TIME ALLOCATION TO SUBJECT MATTER AREAS

It is the responsibility of the local Vocational Agriculture/Agribusiness instructor to develop a time plan which allocates adequate time for teaching within the various content areas of his local program.

Some example time plans appear in the appendix of this publication.

### A PLANNED PUBLIC RELATIONS PROGRAM

Public relations begin as soon as the local high school hires a Vocational Agriculture/Agribusiness instructor. The everyday activities and the program of the Vocational Agriculture/Agribusiness instructor, to a large degree, are his public relations program, since the future of the department depends to a large degree on the image of his program in that community. It is the job of the teacher to so motivate his students that, by their enthusiasm for the program, they become a public relations medium.

Another step might be to make use of various methods by which the public can become informed as to what the program is, what its purposes and services are, and the people for whom it is designed.

Local newspapers, radio, TV, window displays, and public appearances or the program of local groups are all means of telling the story of the agriculture industry and the Vocational Agriculture/Agribusiness program. The many activities growing out of the FFA serve as excellent news and publicity material.

It is recommended that the instructor develop a planned public relations calendar for his program.

### COMPETITIVE ACTIVITIES

The educational use of contests, awards and other motivational

activities is recognized as an integral part of the Vocational Agriculture/Agribusiness program. The local instructor should attempt to use these available opportunities in such a manner so as to promote the interest of the students in the Vocational Agriculture/Agribusiness program. When used correctly the activities can serve to enhance the learning on the part of the students and promote the effectiveness of the classroom instructor.

## EVALUATION

PHILOSOPHY OF EVALUATION

Evaluation of a Vocational Agriculture/Agribusiness is a vital ingredient to ensure its success, and should be structured and implemented on a regular schedule. Evaluation is the collection of supportive evidence for future program directions and program improvement.

(A) Management by Objectives

Management by objectives consists of establishing major program goals, student performance objectives and selecting suitable criteria for measuring success of program goals and performance objectives.

(B) True Accountability

Accountability is a highly structured approach to measuring the achievement of specific program objectives. Steps to implementation include: (1) Performance criteria related to the Vocational Agriculture/Agribusiness program must be established. (2) An impartial judgment focused on degree of success of each performance criterion must be obtained and (3) a public report of the findings must be submitted to those involved with the program.

(C) Process vs. Product Evaluation

Evaluation of Vocational Agriculture/Agribusiness programs must involve both process and product evaluation. Process evaluation involves the effective utilization of the following inputs: teacher salary, equipment, facilities, curriculum, teaching methods, teaching materials, text references and supplies. Product evaluation consists of collecting evidence to substantiate the student outcomes of those receiving the benefits of the program. Examples of evidence suitable for product evaluation are: percent graduates employed, percent graduates employed in on-farm and off-farm agriculture, and competencies and skills possessed by students who were receptive to the learning process.

(D) Evaluation vs. Accreditation

Evaluation is the preferred method for judging degree of success and future program direction at the local Vocational Agriculture/Agribusiness program level. Accreditation of South Dakota Vocational Agriculture/Agribusiness programs has historically been associated with North Central Association Accreditation for Secondary Schools. When a high school with a Vocational Agriculture/Agribusiness program is visited by a North Central accreditation team the Vocational Agriculture/Agribusiness program is to be considered as an integral part of the total high school accreditation process.

### WHEN TO EVALUATE AND WHO SHOULD PARTICIPATE

Evaluation should be an on-going effort. Appraisal of effectiveness of teaching, teaching materials, curriculum and other elements should be done as the teaching learning process is conducted. However, a more concerted effort should be concentrated once annually in the interest of total program evaluation. The consummation of this effort should be in the form of a report to the administration and board of education on the program conducted during the year, its activities and progress. The time of doing this each year can be determined locally.

Those affected by the program and who are or will be the beneficiaries of the results of evaluation should be involved in the evaluation process. Such persons include the teacher, students, administrators, school board members, employers, advisory council members, parents, and state supervisory and teacher education staff members. Follow-up studies of former students should involve those who have been out of school for a long enough period of time to allow for their establishment in an occupation.

### SELF-EVALUATION

Self-evaluation implies that local people assess the effectiveness of local programs. This is in contrast to the procedure in which outside evaluators come in to appraise the local program. Since the outcomes of self-evaluation have far-reaching educational values locally, this approach is the preferable one. It includes studying the local program of Vocational Agriculture/Agribusiness in terms of its philosophy and objectives, needs, clientele served, facilities, competencies developed, organization, curriculum and other measures of adequacy and effectiveness.

### EVALUATION OF STUDENT LEARNING

Evaluation for determining the degree of student learning and degree of competency possessed can be accomplished by pencil and paper tests and student performance testing. A total evaluation of student learning must include not only testing within the school, but also the collecting of evidence demonstrating the utilization of skills and competencies possessed as related to the student's supervised occupational experience program.

### EVALUATION CRITERIA AND INSTRUMENTS

The following is a suggested list of criteria used in evaluating a Vocational Agriculture/Agribusiness department. This list could include but not limited to:

- A. Program Objectives
- B. Curriculum
- C. Equipment

- D. Facilities
- E. FFA Program
- F. Role of the Advisory Council
- G. Competencies Possessed (student)
- H. Follow-up of Former Students

Techniques to accomplish the above could be the following:

- A. Interviews
    - 1. Students
    - 2. Adults in Production Agriculture
    - 3. Adults employed in Off-Farm Agribusiness
    - 4. Administration
    - 5. Employers
  - B. Reports and Documentations (copies of State Vocational Agricultural reports, FFA scrapbook, etc.)
  - C. Questionnaires
- Suggested program evaluation instruments are found in the appendix.

#### SUPERVISED OCCUPATIONAL EXPERIENCE PROGRAM

To evaluate a Supervised Occupational Experience program (on-farm and off-farm) the following criteria should be used:

1. All students are involved in either on-farm or off-farm experience.
2. Curriculum for related instruction.
3. Written training plans.
4. Written training agreements.
5. Earnings.
6. Utilization of efficiency factors.
7. Extent of approved practices used.
8. Extent of supplementary practices used.
9. Extent of improvement projects completed.
10. Role of advisory council.
11. Instructor supervision records & extent of supervision.
12. Completeness of record keeping system.
13. Percent of records completed.
14. Student progress toward occupational goals.
15. Placement and follow-up of students.

#### MECHANIZED AGRICULTURE

To evaluate an Agricultural Mechanics program the following list of criteria should be used:

- A. Facilities
- B. Equipment
- C. Safety standards
- D. Curriculum
- E. Degree of skill development



## EVALUATION OF FFA ACTIVITIES

The evaluation of FFA activities should properly consist of the extent of and completeness of the local chapter program of activities. An essential ingredient of the local chapter program of activities would include opportunities for each student to develop potential leadership abilities.

The evaluation would best be conducted by determining the extent of and scope of activities as reported in the National Chapter Award Program. This form can be found in the Chapter Guide to FFA Activities booklet.

## ADULT PROGRAMS

The following evaluation criteria should be used when evaluating an Adult program:

- A. Objectives
- B. Number of meetings
- C. Average attendance
- D. Curriculum
- E. Farm record and analysis completed
- F. Role of the Advisory council
- G. Planning
- H. Follow-up

## EVALUATING FACILITIES

The facilities typically used in South Dakota programs of Vocational Agriculture/Agribusiness education include a classroom, agricultural mechanics laboratory, and office-conference room. In some cases a separate laboratory is provided for such instruction as soil testing, seed testing, etc.

In evaluating the classroom part of the facility, points to include are: size, arrangement, storage, equipment, lighting, heating, ventilation, decor, water supply, washing facilities, locker space, safety aspects, restrooms, and housekeeping. The office-conference room should be evaluated on its size, location, adequacy of view, arrangement, equipment, heating, lighting, ventilation, decor and housekeeping.

Standards for facilities evaluation are available from the office of the state supervisor of Agricultural Education and from Agricultural Education teacher training departments in South Dakota and other states.

It is desirable to have an instructional laboratory adjacent to the Vocational Agriculture/Agribusiness classroom. The laboratory is utilized to allow students to perform tasks and allow the Vocational Agricultural/Agribusiness instructors to perform demonstrations that

normally could not be conducted in the regular classroom due to the necessity of water and sewer facilities. It also provides an excellent overflow room to enhance multiple student activities to occur at a given time. Suggested criteria include: size, arrangement, storage, safety aspects and housekeeping.

#### REFERENCES

1. A course of Study For Adult Farmer  
Instruction in Farm Management and Farm  
Business Analysis, Palan and Persons,  
University of Minnesota
2. Adult Education in Agriculture, Bender,  
McCormick, Woodin, Cunningham, and Wolfe,  
Charles E. Merrill Publishing Company
3. Agricultural Education: Approaches to Learning  
and Teaching, Drawbaugh and Hull, Charles E.  
Merrill Publishing Company, A. Bell and Howell  
Company, Columbus, Ohio
4. A Guide for Instruction in Agriculture Education  
Curriculum Bulletin No. 15, State of Minnesota  
Department of Education, St. Paul, Minnesota
5. Career Education - Developing Human Potential,  
South Dakota State Board of Vocational Education
6. Career Education--Perspective and Promise  
Goldhammer and Taylor, Charles E. Merrill  
Publishing Company
7. Contemporary Concepts in Vocational Education  
First Yearbook, American Vocational Association
8. Facilities Evaluation in Vocational and Technical  
Education, Robertson, J. Marvin, Ohio State University
9. For More Effective Teaching, Alfred H. Krebs  
The Interstate, Printers & Publishers, Inc. Danville, Illinois
10. Guidelines for Evaluation of Local Programs of Vocational  
Agriculture--Assessment of Outcomes
11. Handbook on Agricultural Education in Public  
Schools. Lloyd J. Phipps, The Interstate Printers  
& Publishers, Inc. Danville, Illinois.
12. Handbook of Agricultural Occupations, Hoover, Norman K.,  
The Interstate Printers and Publishers

13. Journal of Career Education, Department of Practical Arts and Vocational-Technical Education, University of Missouri-Columbia
14. Leadership For Action in Rural Communities, Krietlow, Aitou, and Torrence, The Interstate Printers and Publishers, Inc., Danville, Illinois
15. Local Application for Vocational-Technical Education, Division of Vocational Education, Pierre, So. Dak.
16. Locally Directed Evaluation of Local Vocational Education Programs, Byram and Robertson, Michigan State University
17. Methods In Adult Education, Morgan, Holmes, and Bundy, The Interstate Printers and Publishers
18. Multi District Secondary Vocational Education in South Dakota, South Dakota State Board of Vocational Education
19. Multi District Time Allocation of Classroom Scheduling, Clarence Hall Vocational Agriculture Instructor Watertown, South Dakota
20. Occupational Information in Agriculture, Byram and Lambert, Michigan State University
21. Personnel Evaluation in Vocational and Technical Education, Robertson, J. Marvin, Ohio State University
22. Planning Guide for Multi-District Secondary Occupational-Vocational Education in South Dakota, South Dakota State Board of Vocational Education
23. Program Evaluation in Vocational and Technical Education, Denton, William T., Ohio State University
24. Public Relations for Vocational Agriculture, Cardozier, V. R., Demeter Books
25. South Dakota State Plan for Vocational-Technical Education, State Board of Vocational Education, Division of Vocational Education, Pierre, South Dakota
26. Student Evaluation in Vocational and Technical Education Denton, William T., Ohio State University
27. Vocational Agriculture Department Evaluation (State Supervisor Form) Division of Vocational Education, Pierre, South Dakota
28. Time Allocation Chart, Clarence Hall Vocational Agriculture Instructor Watertown, South Dakota

PART II

INSTRUCTION

## INSTRUCTIONAL CONTENT AREAS

## 1. Agricultural Production (01.01)

## Example Performance Objectives:

1. Given an item to be depreciated and sufficient financial information the student will be able to set up a depreciation schedule and correctly calculate depreciation by two depreciation methods.
2. Given a list of feeds, including homegrown and commercial, the cost of each and a given species of livestock the student will be able to design a least-cost balanced ration that is appropriate for the animal's weight, sex, age and productive purpose.
3. When given a grain sample containing weed seeds, the student will correctly identify the primary noxious weed seeds to the satisfaction of the instructor.

## Occupational Titles - Animal Science

Instructional programs based upon content in this guide will prepare individuals for job entry, will upgrade occupational skills, or will prepare learners for further occupational preparation.

General Occupations

Farmer  
 Veterinarian (large animal)  
 Farmhand  
 Livestock Herdsman  
 Livestock Auctioneer  
 Livestock Breeder  
 Production Researcher  
 Nutrition Researcher  
 Meat Science Researcher  
 Nutritional Physiologist  
 Livestock Farmer  
 Veterinarian's Assistant  
 Livestock Farmhand  
 Animal Science Teacher  
 Livestock Caretaker  
 Extension Service Livestock Specialist  
 Breeding Researcher  
 Muscle Biology Researcher  
 Livestock Geneticist  
 Reproduction Researcher  
 Artificial Insemination Technician  
 Vocational/Agricultural Instructor

Horse Occupations

Horse Herdsman  
 Horse Farmhand  
 Horse Trainer  
 Barn Boss  
 Farrier  
 Horse Breeder  
 Horse Stableboy  
 Horse Teacher

Poultry Occupations

Egg Poultryman  
 Poultry Debeaker  
 Poultry Teacher  
 Turkey Breeder  
 Poultry Farmhand  
 Poultry Breeding Researcher  
 Poultry Products Technologist  
 Meat Poultryman  
 Chicken Sexer  
 Chicken Breeder  
 Poultry Farmer  
 Poultry Geneticist  
 Poultry Nutrition Researcher

Beef Occupations

Beef Farmer  
 Beef Herdsman  
 Beef Teacher  
 Beef Breeder  
 Stock Ranch Foreman  
 Cattle Feeder  
 Beef Farmhand  
 Cowboy  
 Feedlot Foreman  
 Feedlot Maintencenceman  
 Cattle Rancher

Dairy Occupations

Dairy Teacher  
 Dairy Farmhand  
 Dairy Breeder  
 Dairy Farmer  
 Dairy Herdsman  
 Milking Machine Operator

## Content Outline:

## ANIMAL SCIENCE

## I. Livestock Industry

- A. The importance of livestock to the economy
- B. Occupational opportunities

## II. Animal Nutrition

- A. Base fundamentals of animal nutrition
- B. Feed nutrients
- C. Digestion
- D. Feed additives
- E. Formulating and balancing rations

## III. Animal Breeding

- A. Genetics
- B. Reproductive system
- C. Breeding systems
- D. Methods of breeding

Sheep Occupations

Sheep Farmer  
 Sheep Farmhand  
 Wool Shearer  
 Sheep Herdsman  
 Sheep Teacher  
 Sheep Breeder

Swine Occupations

Swine Breeder  
 Swine Herdsman  
 Swine Teacher  
 Swine Farmer  
 Swine Farmhand

#### IV. Beef Cattle

- A. Selection of breeding stock
- B. Feeding and managing the breeding herd
- C. Feeding and managing calves
- D. Selection of feeder cattle
- E. Feeding and managing feeder cattle
- F. Control of diseases and parasites
- G. Housing and equipment for beef cattle
- H. Record keeping and analysis
- I. Marketing beef cattle

#### V. Dairy Cattle

- A. Selection of breeding stock
- B. Feeding and management of producing herd
- C. Feeding and management of calves
- D. Control of diseases and parasites
- E. Housing and equipment
- F. Marketing
- G. Record keeping and analysis

#### VI. Horses

- A. Principles of horse selection
- B. Caring for brood mare and foal
- C. Feeding horses
- D. Horse health
- E. Basic horsemanship
- F. Housing and equipment

#### VII. Poultry

- A. The poultry industry
- B. Selecting chicks and birds for production



- C. Feeding and managing the laying flock
- D. Feeding and managing young chickens
- E. Turkey production and management
- F. Marketing
- G. Control of diseases and parasites

#### VIII. Sheep

- A. Selection of breeding sheep
- B. Feeding and management of breeding flock
- C. Feeding and management of feeder lambs
- D. Control of diseases and parasites
- E. Housing and equipment
- F. Marketing
- G. Record keeping and analysis

#### IX. Swine

- A. Selection of breeding and feeding stock
- B. Feeding and management during breeding
- C. Feeding and management during gestation
- D. Feeding and management during farrowing and lactation
- E. Feeding and management from weaning to market
- F. Control of diseases and parasites
- G. Housing and equipment
- H. Marketing
- I. Record keeping and analysis

#### Suggested Source Materials:

##### Bulletins:

1. THE AVIAN EMBRYO, M 207, Ohio State University Extension Office of Information.



2. IOWA POULTRY OUTLOOK, FS 1259, ISU Extension Service.
3. FEEDING REPLACEMENT PULLETS AND LAYING HENS, PM 354, ISU Extension Service.
4. POULTRY INDUSTRY PROJECT, PM 418, ISU Extension Service.
5. AUTOMATIC FEEDING EQUIPMENT FOR LIVESTOCK AND POULTRY, F 2198, USDA.
6. NATIONAL POULTRY AND TURKEY IMPROVEMENT PLANS AND AUXILIARY PROVISIONS, M 379, USDA.
7. HOW TO BUY POULTRY BY USDA GRADES, MB 1, USDA.
8. HOW TO BREED THE PROFIT IMPROVING COW, Midwest Breeders Cooperative.
9. JUDGING REGISTERED HOLSTEINS, Holstein-Friesian Association of America.
10. NRC NUTRIENT REQUIREMENTS OF DAIRY CATTLE, NO 3, National Academy of Science.
11. CARE OF THE DRY AND FRESH COW, PM 249, ISU Extension Service.
12. FEEDING FOR MILK PRODUCTION, PM 282, ISU Extension Service.
13. DAIRY OUTLOOK, (most current edition), ISU Extension Service.
14. FEEDING THE DAIRY CALF, PM 253, ISU Extension Service.
15. TEN TIPS FOR GOOD MILKING, PM 244, ISU Extension Service.
16. DAIRY CALF DISEASES, PM 237, ISU Extension Service.
17. DAIRY CALF INSECTS AND THEIR DISEASES, PM 322, ISU Extension Service.
18. CALF GROWING PROGRAM, Land O' Lakes Felco.
19. DAIRY CATTLE STERILITY, Hoard's Dairyman.
20. DAIRY CATTLE STERILITY, Michigan State University.
21. HIGHLIGHTS OF BREEDING SYSTEMS, Holstein-Friesian Association of America.
22. MODERN MASTITIS MANAGEMENT, TUCO, Division of Upjohn.
23. DAIRY CATTLE BREEDS, VAS 1046, Illinois Vo-Ag Service.
24. RAISING DAIRY HEIFERS AND BULLS, VAS 1022, Illinois Vo-Ag Service.
25. RAISING DAIRY CALVES, VAS 1021, Illinois Vo-Ag Service.
26. STANDARDS FOR MEASURING EFFICIENCY FOR 1972, Illinois Vo-Ag Service.
27. DAIRY PRODUCTION GUIDE, Land O' Lakes Felco.
28. FACTS IOWA DAIRYMEN SHOULD KNOW ABOUT MASTITIS, V 405, ISU Extension Service.
29. BRUCELLOSIS IN CATTLE, HOGS, AND PEOPLE, PM 162, ISU Extension Service.
30. 1972 AREA DAIRY SEMINAR, University of Illinois.
31. BASIC DAIRY HERD HEALTH, Wisconsin Department of Public Instruction.
32. THE COW'S UDDER AND HOW IT FUNCTIONS, VAS 1025, Illinois Vo-Ag Service.
33. JUDGING DAIRY CATTLE, Witt, University of Illinois.
34. MILKING MACHINE MAINTENANCE, DH 92, Agricultural Publications, Purdue.
35. LIQUID MANURE HANDLING FOR DAIRY CATTLE, DH 114, Agricultural Publications, Purdue.
36. MILKING MACHINE CARE, SC 97, Wisconsin Extension Service.
37. DAIRY CATTLE BREEDS, FI 443, USDA.
38. INFECTIOUS REPRODUCTIVE PROBLEMS OF CATTLE, VY 21, Agricultural Publications, Purdue.

39. HELP PREVENT MILK CONTAMINATION, CS 5, ISU Extension Service.
40. THE NATIONAL COOPERATIVE DAIRYHERD IMPROVEMENT PROGRAM HANDBOOK, 278, USDA.
41. LOOSE HOUSING SYSTEM FOR DAIRY CATTLE, USDA.
42. DAIRY EQUIPMENT PLANS, MWPS 7, Midwest Plan Service.
43. QUALITY MILK PRODUCTION, Pennsylvania State University.
44. ADVANCED LIVESTOCK PRODUCTION UNIT FOR DAIRY, Instructional Materials Laboratory, University of Missouri.
45. FACT SHEETS: CONDENSED REVIEWS, National Pork Producers Council
46. LIFE CYCLE SWINE NUTRITION, PM 489, ISU Extension Service.
47. HOG MANAGEMENT CALENDAR, Dec, 1972, Wallace's Farmer.
48. NUTRITIONAL REQUIREMENTS OF SWINE, No. 2, National Academy of Science.
49. MEETING AMINO ACID NEEDS OF GROWING AND FINISHING SWINE, FS 1332, ISU Extension Service.
50. GENETIC IMPROVEMENT THROUGH SWINE SELECTION, University of Minnesota.
51. PORK PRODUCERS' DAY, (Most current), ISU Extension Service.
52. SWINE-WITHDRAWAL TIME FOR FEED ADDITIVES, INJECTABLE ANTIBIOTICS, AND PESTICIDES, PM 508, ISU Extension Service.
53. PERFORMANCE PROVEN PUREBREDS, PM 515, ISU Extension Service.
54. SWINE HOUSING AND EQUIPMENT, MWPS 8, Midwest Plan Service.
55. HOG LOT EQUIPMENT, F 2192, USDA.
56. SWINE PRODUCTION GUIDE, Land O' Lakes Felco.
57. CARE AND MANAGEMENT OF THE SOW HERD, AS 311, Agricultural Publications, Purdue.
58. CARE FOR THE SOW AND LITTER AT FARROWING TIME, VAS 1037, Illinois Vo-Ag Service.
59. CARING FOR THE SWINE HERD DURING BREEDING AND GESTATION, VAS 1034, Illinois Vo-Ag Service.
60. DISEASES AFFECTING SWINE REPRODUCTION, VY 17, Agricultural Publications, Prudue,
61. EVALUATION OF SWINE CARCASSES, AS 356, Agricultural Publications, Purdue.
62. HOG SELECTION AND CULLING, AS 312, Agricultural Publications, Purdue.
63. THE SWINE ENTERPRISE, VAS 1029, Illinois Vo-Ag Service.
64. SWINE INFORMATION SERVICE, (numerous titles of specific pamphlets), National Hog Farmer.
65. SWINE NUTRITION, 536, 537, Michigan Extension Service.
66. MANAGING THE BEEF BREEDING HERD, VAS 1010a, Illinois Vo-Ag Service.
67. BUYING AND FEEDING BEEF CATTLE, VAS 1012, Illinois Vo-Ag Service.
68. ARTIFICIALLY INSEMINATING, VAS 1002b, Illinois Vo-Ag Service.
69. FINISHING BEEF CATTLE, 2196, USDA.
70. CATTLE FEEDING, 449, Ohio Extension Service.
71. BEEF CATTLE: DEHORNING, CASTRATING, BRANDING, AND MARKING, F 2141, USDA.
72. BEEF CATTLE IMPROVEMENT, AH 299, USDA.
73. BEEF CATTLE CORRALS, M 1044, USDA.

74. BEEF PRODUCTION GUIDE, Land O' Lakes Felco.
75. BEEF COW MANAGEMENT CALENDAR, AS 373, ISU Extension Service.
76. "AGE" CATTLE BY THEIR TEETH, FS 1095, ISU Extension Service.
77. BEEF OUTLOOK, FS 1255, ISU Extension Service.
78. THE BEEF COW-CALF HERD IN IOWA, PM 400, ISU Extension Service.
79. HANDLING AND FEEDING NEW FEEDER CATTLE, PM 401, ISU Extension Service.
80. INCOME OPPORTUNITIES FOR IOWANS, PM 487, ISU Extension Service.
81. BASIC FEEDLOT NUTRITION, PM 555, ISU Extension Service.
82. HERD MANAGEMENT AND NUTRITION, PM 367, ISU Extension Service.
83. BEEF HOUSING AND EQUIPMENT HANDBOOK, MWPS 6, Midwest Plan Service.
84. BEEF MARKETING, Pennsylvania State University.
85. SELECTING, FITTING, AND SHOWING A BEEF STEER, Pennsylvania State University.
86. APPROVED PRACTICES FOR BEEF, Illinois Vo-Ag Service.
87. HOW ANTIBIOTICS IMPROVE SWINE PERFORMANCE, Elanco Products Company.
88. MANAGEMENT AND HOUSING FOR CONFINEMENT SWINE PRODUCTION, Cir. 1064, Illinois Extension Service.
89. TWELVE KEYS TO PROFITS IN LAMB PRODUCTION, PM 284, ISU Extension Service.
90. APPLIED SHEEP NUTRITION, PM 419, ISU Extension Service.
91. SHEEP EQUIPMENT PLANS, MWPS 3, Midwest Plan Service.
92. CARING FOR THE SHEEP BREEDING FLOCK, VAS 1001a, Illinois Vo-Ag Service.
93. SELECTION AND PURCHASING SHEEP, VAS 1003, Illinois Vo-Ag Service.
94. FEEDING LAMBS, VAS 1027, Illinois Vo-Ag Service.
95. THE SHEEP ENTERPRISE, VAS 1031, Illinois Vo-Ag Service.
96. BLOCKING AND TRIMING SHEEP, VAS 1044, Illinois Vo-Ag Service.
97. SHEEP FLOCK MANAGEMENT CALENDAR, AS 384, ISU Extension Service.
98. HORSES - COMPLETE MANAGEMENT, Albers Milling Company.
99. STUDENT'S STUDY GUIDE FOR HORSE FARM EMPLOYEE, Department of Vocational Education, University of Kentucky.
100. CASTRATING, DOCKING, AND DEHORNING, VAS 1032, Illinois Vo-Ag Service.
101. DIGESTION IN ANIMALS, VAS 1026, Illinois Vo-Ag Service.
102. IMPROVING ANIMALS THROUGH BREEDING, VAS 1009, Illinois Vo-Ag Service.
103. MINERALS FOR LIVESTOCK, VAS 1018, Illinois Vo-Ag Service.
104. LIVESTOCK BREEDING, Ohio State University.
105. THE CATTLEMAN'S HANDBOOK, Ralston Purina Company.
106. FARMSTEAD PLANNING MANUAL, (1:General; 2:Beef; 3:Swine; 4:Dairy) Agricultural Building Products Department, Granite City Steel Company.
107. AGRICULTURAL STATISTICS, (most current), USDA.
108. JOURNAL OF ANIMAL SCIENCE, American Society of Animal Science.

109. LIVESTOCK JUDGING AND EVALUATION, AS 388, Extension Service, Purdue.
110. CENSUS OF AGRICULTURE, PART 16: SD, (most current), Bureau of the Census, US Department of Commerce, USDA.
111. HORSE SHOW MANAGEMENT GUIDELINES, USDA.
112. LIVESTOCK WASTE MANAGEMENT IN A QUALITY ENVIRONMENT, Cir. 1074 University of Illinois Extension Service.
113. 1973 LIVESTOCK WASTE MANAGEMENT CONFERENCE, Department of Agricultural Engineering, University of Illinois.
114. BULLETIN CATALOG, "PUBLICATIONS OFF THE PRESS," Agriculture and Home Economics, Cooperative Extension Service, SDSU.

Books:

1. ANIMAL SCIENCE AND INDUSTRY, Acker; Prentice-Hall, Inc.
2. LIVESTOCK AND POULTRY PRODUCTION, Bundy and Diggins; Prentice-Hall, Inc.
3. ANIMAL SCIENCE, Ensminger; Interstate Printers and Publishers.
4. THE STOCKMAN'S HANDBOOK, Ensminger; Interstate Printers and Publishers.
5. ANIMAL NUTRITION, Maynard and Loosli; McGraw-Hill Book Company.
6. FEEDS AND FEEDING, Morrison; Morrison Press.
7. PHYSIOLOGY OF LACTATION, Smith; ISU Press.
8. BREEDING AND IMPROVEMENT OF FARM ANIMALS, Rice, Andrews, Warwick, and Legates; McGraw-Hill Book Company.
9. JUDGING LIVESTOCK, DAIRY CATTLE, POULTRY, AND CROPS, Yountz and Carlson; Prentice-Hall.
10. GENETICS OF LIVESTOCK IMPROVEMENT, Lasley; Prentice-Hall, Inc.
11. LIVESTOCK JUDGING AND EVALUATION, Nordby, Beeson, and Fourt; Interstate Printers.
12. LIVESTOCK DISEASES, 1956 Yearbook; United States Department of Agriculture.
13. A VETERINARY GUIDE FOR FARMERS; Windsor Press.
14. ANIMAL SANITATION AND DISEASE CONTROL, Dykstra; Interstate Publishers and Printers.
15. MANAGEMENT OF FARM ANIMAL WASTES: American Society of Agricultural Engineers.
16. APPROVED PRACTICES IN DAIRYING, Juergenson and Mortenson; Interstate Printers and Publishers.
17. DAIRY PRODUCTION, Diggins and Bundy; Prentice-Hall Inc.
18. SELECTING, FITTING, AND SHOWING DAIRY CATTLE, Nordby and Lattig, Interstate Printers and Publishers.
19. DAIRY CATTLE IN AMERICAN AGRICULTURE, Sims and Foreman; ISU Press.
20. POULTRY PRODUCTION, Care; Lea & Febiger, Publishers.
21. POULTRY PRODUCTION, Bundy and Diggins; Prentice-Hall, Inc.
22. SHEEP AND WOOL SCIENCE, Ensminger; Interstate Printers and Publishers.
23. SHEEP PRODUCTION, Diggins and Bundy; Prentice-Hall, Inc.
24. APPROVED PRACTICES IN SHEEP PRODUCTION, Juergenson; Interstate Printers Publishers.

25. SELECTION, FITTING, AND SHOWING HORSES, Nordby; Interstate Printers and Publishers.
26. HORSES AND HORSEMANSHIP, Ensminger; Interstate Printers and Publishers.
27. SWINE PRODUCTION, Carroll, Krider, and Andrews; McGraw-Hill Book Company.
28. SWINE SCIENCE, Ensminger; Interstate Printers and Publishers.
29. SWINE PRODUCTION, Bundy and Diggins; Prentice Hall, Inc.
30. COMMERCIAL BEEF CATTLE PRODUCTION, O'Mary and Dryer, Lea & Febiger, Publishers.
31. BEEF PRODUCTION, Diggins and Bundy; Prentice-Hall, Inc.
32. BEEF CATTLE SCIENCE, Ensminger; Interstate Printers and Publishers.

#### SOURCES FOR REFERENCES AND INSTRUCTIONAL AIDS

1. Agriculture Education Service  
Montgomery, Alabama 36100
2. Albers Milling Company  
800 West 47th Street  
Kansas City, Missouri 64112
3. American Hereford Association  
Public Relations Department  
Hereford Drive  
Kansas City, Missouri 64105
4. American Meat Institute  
59 East Van Buren Street  
Chicago, Illinois 60600
5. The American Quarterhorse Association  
P.O. Box 200  
Amarillo, Texas 79105
6. American Sheep Producer's Council  
200 Clayton Street  
Denver, Colorado 80202
7. American Society of Agriculture Engineers  
St. Joseph, Michigan 49085
8. American Society of Animal Science  
425 Illinois Building  
113 North Neil Street  
Champaign, Illinois 61820
9. A. O. Smith Harvestore Products, Inc.  
550 West Algonquin Road  
Arlington Heights, Illinois 60005

10. Armour and Company  
Public Relations Department  
P.O. Box 9222  
Chicago, Illinois 60690
11. Bureau of the Census  
Department of Commerce  
Superintendent of Documents  
U.S. Government Printing Office  
Washington, D.C. 20402
12. Chief of Division of Animal Industries  
State House  
Des Moines, Iowa 50319
13. Dictionary of Occupational Titles  
U.S. Department of Labor  
Superintendent of Documents  
U.S. Government Printing Office  
Public Documents Department  
Washington, D.C. 20402
14. Elanco Products Company  
Eli Lilly and Company  
Indianapolis, Indiana 46200
15. Gehl Bros. Manufacturing Co.  
West Bend, Wisconsin 53095
16. Granite City Steel Company  
Agricultural Building Products Division  
Granite City, Illinois 62040
17. Hoard's Dairyman  
Fort Atkinson, Wisconsin 53538
18. Holstein-Friesian Association of America  
Extension Department  
Brattleboro, Vermont 05301
19. Indiana State University  
Vocational Resources Center  
Department of Vocational Technical Education  
Terre Haute, Indiana 47809
20. The Interstate Printers and Publishers, Inc.  
1927 North Jackson Street  
Danville, Illinois 61832
21. Iowa State University  
Cooperative Extension Service  
Public Distribution Center  
Printing and Publishing Building  
Ames, Iowa 50010

22. Iowa State University  
Media Resources Center  
Pearson Hall  
Ames, Iowa 50010
23. IAVIM Center  
Attention: Thomas A. Hoerner  
Agricultural Engineering Department  
Iowa State University  
Ames, Iowa 50010
24. Iowa State University Press  
Press Building  
Ames, Iowa 50010
25. John Deere  
201 South Jefferson  
St. Louis, Missouri 63103
26. Land O' Lakes Felco  
2827-8th Avenue South  
Fort Dodge, Iowa 50501
27. Lea & Febiger, Publishers  
600 Washington Square  
Philadelphia, Pennsylvania 19106
28. McGraw-Hill Book Company  
Manchester Road  
Manchester, Missouri 63011
29. Michigan State University  
Cooperative Extension Service  
East Lansing, Michigan 48823
30. Midwest Breeders Cooperative  
Shawano, Wisconsin 54166
31. Midwest Plan Service  
Agricultural Engineering Building  
Ames, Iowa 50010
32. Modern Talking Pictures Service, Inc.  
1212 Avenue of the Americas  
New York, New York 10036
33. Morrison Publishing Company  
515 Woodlands Drive  
Clinton, Iowa 52732
34. National Academy of Science  
Printing and Publishing Office  
2101 Constitution Avenue  
Washington, D.C. 20418

35. National Hog Farmer  
Grundy Center, Iowa 50638
36. National Livestock and Meat Board  
36 South Wabash Avenue  
Chicago, Illinois 60604
37. National Pork Producers Council  
4715 Grand Avenue  
Des Moines, Iowa 50312
38. Ohio State University  
Extension Office of Information  
2120 Fyffe Road  
Columbus, Ohio 43210
39. Ohio State Univeristy  
Instructional Materials Service  
Department of Agricultural Education  
2120 Fyffe Road  
Columbus, Ohio 43210
40. Oklahoma State University  
Curriculum and Instructional Materials Center  
Stillwater, Oklahoma 74074
41. Pennsylvania State University  
Department of Agriculture Education  
University Park, Pennsylvania 16802
42. Prentice-Hall, Inc.  
Educational Book Division  
Englewood Cliffs, New Jersey 07632
43. Public Relations Department  
Indiana Farm Bureau Cooperative Association, Inc.  
47 South Pennsylvania Street  
Indianapolis, Indiana 46209
44. Purdue University  
Agricultural Publications  
A. E. S. Building  
Lafayette, Indiana 47907
45. Ralston Purina Company  
Checkerboard Square  
St. Louis, Missouri 63199
46. Superintendent of Documents  
United States Government Printing Office  
Washington, D.C. 20402
47. Texas A & M University  
College Station, Texas 78712



48. Texaco, Inc.  
Sales Product Manager  
322 South Michigan Avenue  
Chicago, Illinois 60604
49. TUCO  
Division of Upjohn  
Agricultural Division  
Department 9510  
Building 190-1  
Kalamazoo, Michigan 49001
50. Union Pacific Railroad  
1416 Dodge Street  
Omaha, Nebraska 68102
51. University of Illinois  
Cooperative Extension Service  
Urbana, Illinois 61801
52. University of Illinois  
Department of Agricultural Engineering  
Urbana, Illinois 61801
53. University of Illinois  
Vocational Agricultural Service  
434 Mumford Hall  
Urbana, Illinois 61801
54. University of Kentucky  
Cooperative Extension Service  
Lexington, Kentucky 40500
55. University of Kentucky  
Department of Vocational Education  
Lexington, Kentucky 40500
56. University of Minnesota  
Agricultural Education Department  
St. Paul, Minnesota 55100
57. University of Missouri  
Instructional Materials Laboratory  
8 Industrial Education Building  
Columbia, Missouri 65201
58. University of Wisconsin  
Cooperative Extension Service  
College of Agriculture  
Madison, Wisconsin 53715
59. Vocational Education Productions  
California Polytechnic State University  
San Luis Obispo, California 93401

60. Wallace's Farmer  
1912 Grand Avenue  
Des Moines, Iowa 50305
61. Webb Publishing Company  
1999 Shepard Road  
St. Paul, Minnesota 55116
62. Windsor Publications  
2550 Crawford  
Evanston, Illinois 60201
63. Wisconsin Department of Public Instruction  
Bureau of Career and Manpower Development  
Madison, Wisconsin 53702
64. Bulletin Room  
Extension Building  
South Dakota State University  
Brookings, South Dakota 57006

#### Occupational Titles - Custom Farm Operator

Instructional programs based upon content in this guide will prepare individuals for job entry, will upgrade occupational skills, or will prepare the learner for further occupational preparation.

Cash Grain Farmer	Fieldman, Food Processing Company
Custom Farm Operator	Packing Shed Foreman
Experimental Farm Manager	Grain Inspector
Certified Seed Producer	Seed Inspector
Fertilizer or Lime Applicator	Research Technician
Spray Equipment Operator	Weed Control Assistant
Harvesting Supervisor	Seed Production Manager
Pilot - Pest Control Applicator	Weed Inspector
Farmhand	Truck Driver - Grain and Supplies
Farm Loan Assistant	Feed Mill Employee
Farm Record Specialist	Elevator Manager
Farm Manager	Elevator Employee
Abstractor	Certified Seed Field Inspector
Hail Insurance Adjustor	Farm Machinery Dealer
Farm Realtor	Farm Machinery Salesman or Mechanic
PCA Manager	Farm Equipment Fabricator
Farm Supply Salesman	Farm Equipment Research Technician
Grain Buyer	Agricultural Engineer
Hay and Forage Buyer	Farm Machinery Company District Manager
Produce Department Manager	Grain Dryer Operator
Chemical Salesman or Fieldman	Soil Conservation Aide (Technician)
Grain Products Salesman	Pilot-Soil Mapping
Farm Fuel Supplier	Soil Conservationist
Food Processing Company Employee	Soil Scientist
Fertilizer Dealer or Fieldman	Park Naturalist
Fertilizer Plant Employee	Park Employee

Advertising Firm Manager	Drainage Contractor
Market Research Analyst	Soil Mapper
Extension Director	Soil Test Lab Employee
Extension Crops or Soils Specialist	Wildlife Conservation Officer
Pathologist	College Professor
Entomologist	Peace Corps Volunteer
Botanist	County Assessor
Vocational Agriculture Instructor	Plant Breeder
Agricultural Journalist	Agricultural Missionary
Agricultural Broadcaster	Farm Newspaper Editor
Auctioneer	Foreign Agricultural Service Employee
Commodity Broker	Agricultural Economist
Seed Processing Foreman	

Content Outline:

PLANT SCIENCE

I. Opportunities

- A. Economic values
- B. Employment

II. Soils

- A. Formation
- B. Classification
- C. Properties (physical & chemical)
- D. Testing
- E. Nutrients
- F. Conservation and land use
- G. Fertilization and fertilizers

III. Plant Growth

- A. Plant types
- B. Germination and emergence
- C. Propagation and improvement
- D. Life processes (photosynthesis, respiration, transpiration, assimilation and digestion)

- IV. Weeds and weed control
  - A. Identification
  - B. Control (cultural & chemical)
  - C. Classification
- V. Small Grains (oats, wheat, barley, rye, flax) Production
  - A. Uses
  - B. Types
  - C. Seedbed preparation
  - D. Planting
  - E. Seed selection and varieties
  - F. Weed control
  - G. Fertilizer application
  - H. Insects and diseases
  - I. Harvesting
  - J. Storage
  - K. Marketing
  - L. Production efficiency
- VI. Corn Production
  - A. Uses
  - B. Seed selection
  - C. Planting
  - D. Weed control
  - E. Fertilizer application
  - F. Insects and diseases
  - G. Harvesting
  - H. Storage

- I. Marketing
  - J. Production efficiency
- VII. Soybean Production
- A. Uses
  - B. Varieties
  - C. Seedbed preparation
  - D. Planting
  - E. Weed control
  - F. Insects & diseases
  - G. Harvesting
  - H. Storage
  - I. Marketing
  - J. Production efficiency
- VIII. Forage Production
- A. Opportunities
  - B. Variety identification and selection
  - C. Tillage and planting
  - D. Renovation practices
  - E. Carrying capacity
  - F. Weed control
  - G. Insects and diseases
  - H. Fertility
  - I. Harvesting
  - J. Storing
  - K. Marketing
  - L. Production efficiency

## IX. Horticultural Crops

## A. Fruits

## B. Garden vegetables

- X. Specialized crops (potatoes, sunflowers, sugar beets, certified seed production, edible beans, etc.) Use same outline format as corn.

(See S. D. Seed Certification Notebook)

## Suggested Source Materials:

Bulletins:

1. POPULATION CHARACTERISTICS OF FARM OPERATOR HOUSEHOLDS, #141, Government Printing Office, Portland, Oregon.
2. CHOOSE YOUR CAREER IN AGRICULTURE, Hoard's Dairyman.
3. EXPLORING CAREERS IN MODERN AGRICULTURE, Penn. State University.
4. FARMERS AND AGRICULTURE IN OUR ECONOMY, Illinois VAS.
5. IOWA WHERE INDUSTRY AND AGRICULTURE MEET, Des Moines Register.
6. AGRICULTURAL CAREERS THAT IMPROVE THE QUALITY OF LIFE, RESTORE THE ENVIRONMENT, FEED THE WORLD, 1972, Maryland State Dept. of Ag. Ed.
7. CAREERS IN AGRICULTURE, Farmland.
8. BACKGROUND ON U. S. AGRICULTURE, #491, USDA.
9. CENSUS OF AGRICULTURE, 1969, Bureau of the Census.
10. COUNTY PLAT BOOK, local courthouse.
11. AGRICULTURAL STATISTICAL REVIEW, USDA.
12. AGRICULTURAL STATISTICS, 1972, USDA.
13. THE BUSINESS OF AGRICULTURE, Iowa Development Commission.
14. IOWA FARM OUTLOOK, ISU Extension.
15. DEFINING SOILS AND WATERSHEDS, Conservation Aide II, 1972, Ohio State.
16. UNDERSTANDING SOILS, 1972, #4052, Illinois VAS.
17. AGRONOMY SCHOOL PROCEEDINGS, 1973, ISU Extension.
18. EXPERIMENTS IN SOIL SCIENCE, #147-1, California VEP.
19. IOWA SOIL SURVEYS, Soil information by soil series, 1970, USDA & SCS.
20. INTRODUCTORY EXPERIMENTAL SOIL SCIENCE, Stipes.
21. TAKE A GOOD SOIL SAMPLE, PM 287, ISU Extension.
22. UNDERSTANDING YOUR SOIL TEST REPORT, PM 429, ISU Extension.
23. MINIMUM TILLAGE, #4041, Illinois VAS.
24. OUR LAND AND ITS CARE, Fertilizer Institute.
25. CAREERS IN SOIL CONSERVATION, #171, USDA.
26. MOISTURE FARM MANUAL, 1969, Standard Oil.
27. WEATHER MANAGEMENT, 1969, Successful Farming.
28. WEATHER FARM MANUAL, 1969, Standard Oil.
29. TILLAGE ALTERNATIVES FOR IOWA, 1970, PM 488, ISU Extension.
30. CONTROLLING WIND EROSION IN IOWA, PM 432, ISU Extension.
31. IOWA'S NEW CONSERVANCY DISTRICTS AND SOIL LOSS LIMIT REGULATIONS.
32. THE SUBSOIL MOISTURE SITUATION, Ag 21-A, ISU Extension.
33. IMPROVE YOUR SUBSOIL MOISTURE FOR HIGHER YIELDS, FS 1370, ISU Extension.

34. IOWA'S DISAPPEARING ACRES-HOW MUCH? HOW FAST?, FS 1091, ISU Extension.
35. TESTING SOIL FOR PHOSPHORUS, 1969, Illinois VAS.
36. HUNGER SIGNS IN CROPS, #4011a, Illinois VAS.
37. THE FERTILIZER HANDBOOK, Fertilizer Institute or Farmland.
38. FERTILIZER SAFETY GUIDE, Fertilizer Institute.
39. ANHYDROUS AMMONIA SAFETY, Fertilizer Institute.
40. WHAT IS FERTILIZER? Fertilizer Institute.
41. PLANNING THE NITROGEN PROGRAM, 4009a, Illinois VAS.
42. FERTILIZER FARMACY FILE, Farmland.
43. FERTILIZER FARM MANUAL, 1969, Standard Oil.
44. FERTILIZER SUGGESTIONS FOR CORN YIELDS ABOVE 125 BUSHEL PER ACRE, #ST-5, ISU Extension.
45. THREE WAYS TO APPLY ROW FERTILIZER, PM 361, ISU Extension.
46. LIQUID FERTILIZERS, FS 709, ISU Extension.
47. FALL APPLIED PHOSPHORUS AND POTASSIUM, PM 392, ISU Extension.
48. BETTER PASTURES WITH FERTILIZER, FS 1366, ISU Extension.
49. FARM CROP IDENTIFICATION AND JUDGING, #RM-7, University of Missouri.
50. GRASS AND LEGUME IDENTIFICATION, #RM-12, University of Missouri.
51. AGRICULTURAL CROPS: EXERCISES IN BIOLOGICAL PRINCIPLES, #149-1, California VEP.
52. LABORATORY STUDIES IN FIELD CROP SCIENCE, Stipes.
53. APPROVED PRACTICES FOR OATS, Illinois Vas.
54. SOME IDENTIFYING CHARACTERISTICS OF 60 CROP AND WEED SEEDS, Rev. 1972, Ohio State Ag. Ed.
55. CERTIFIED SEED REQUIREMENTS, Iowa Crop Improvement Association.
56. FERTILIZING GRAIN SORGHUM FOR PROFIT, Farmland.
57. SEED MANUAL, 1968, Ohio State Ag. Ed.
58. OAT VARIETY PERFORMANCE, Ag 10, ISU Extension.
59. GRAIN SORGHUM PERFORMANCE, Ag 16, ISU Extension.
60. TESTING CORN, SOYBEANS, OATS, AND SORGHUM VARIETIES ON YOUR FARM, FS 1298, ISU Extension.
61. NEW MULTILINE OATS, FA 1349, ISU Extension.
62. RUSTS IN GRAIN CROPS, PM 185, ISU Extension.
63. PROFITABLE CORN PRODUCTION, PM 409, ISU Extension.
64. WHEN TO SELL CORN, SOYBEANS, OATS, WHEAT, Circ. 948, Illinois Extension.
65. FERTILIZE CORN FOR PROFIT, Farmland.
66. CORN GROWERS' GUIDE, 1968, PAG.
67. CONTROL OF SOIL INSECTS WHICH ATTACK IOWA CORN, ISU Extension.
68. WHAT ABOUT CONTINUOUS CORN?, FS 857, ISU Extension.
69. CALENDARIZED ROW CROP PRODUCTION, FS 963, ISU Extension.
70. A NEW DISEASE IN IOWA CORN FIELDS, FS 1124, ISU Extension.
71. P & K FERTILIZER FOR CORN-HOW TO APPLY, FS 1130, ISU Extension.
72. POPCORN-ITS PRODUCTION, PROCESSING, UTILIZATION, PM 127, ISU Extension.
73. GROWTH AND NUTRIENT UPTAKE BY CORN, PM 277, ISU Extension.
74. FALL-APPLIED ANHYDROUS AMMONIA FOR CORN, PM 334, ISU Extension.
75. CORN LEAF DISEASES IN IOWA, PM 507, ISU Extension.
76. CORN REFINERS ANNUAL, Corn Refiners.
77. APPROVED PRACTICES FOR CORN, 1972, Illinois VAS.
78. PRODUCING HIGH CORN YIELDS, Illinois VAS.

79. CORN INSECTS AND THEIR CONTROL, 4040a, Illinois VAS.
80. WHAT AFFECTS PRICES OF AGRICULTURAL PRODUCTS, 6009, Illinois VAS.
81. BE YOUR OWN CORN DOCTOR, Fertilizer Institute.
82. CORN PLANTER CALIBRATION FOR HIGHEST YIELDS, Circ. 840, Illinois Extension.
83. ECONOMIC CONSIDERATIONS IN CHOOSING A CORN HARVEST METHOD, AERR 13, Illinois Extension.
84. HARVESTING CORN WITH COMBINES, Illinois Agric. Engineering Dept.
85. PLANT DISEASES (CORN STALK ROTS), #200, Illinois Extension.
86. PLANT DISEASES (STEWART'S LEAF BLIGHT OF CORN), #201, Illinois Extension.
87. PLANT DISEASES (NORTHERN & SOUTHERN CORN LEAF BLIGHTS), #202, Illinois Extension.
88. PLANT DISEASES (COMMON CORN SMUT), #203, Illinois Extension.
89. PLANT DISEASES (EAR CORN ROTS), #305, Illinois Extension.
90. PLANT DISEASES (STORAGE ROTS OF CORN), #206, Illinois.
91. UNLOCKING SOYBEAN PROFITS, Successful Farming.
92. IOWA SOYBEAN YIELD TEST REPORT, Ag 18, ISU Extension.
93. SOYBEAN YIELDS CAN BE INCREASED, FS 1209, ISU Extension.
94. THREE NEW AND BETTER LARGE-SEEDED SOYBEANS, FS 1221, ISU Extension.
95. ANOTHER LOOK AT INOCULATION, FS 1274, ISU Extension.
96. PROFITABLE SOYBEAN PRODUCTION, PM 441, ISU Extension.
97. SOYBEAN DISEASES, PM 528, ISU Extension.
98. IRON CHLOROSIS IN SOYBEANS, PM 531, ISU Extension.
99. BROWN STEM ROT IN SOYBEANS, FS 1178, ISU Extension.
100. HOW GOOD IS IOWA SOYBEAN SEED?, FS 1188, ISU Extension.
101. SOYBEANS--WILL PROBLEMS LEAD TO PROGRAMS? FS 1327, ISU Extension.
102. IOWA VOCATIONAL AGRICULTURE RECORD BOOK, Interstate.
103. A TEACHER'S GUIDE ON MODERN SOYBEAN PRODUCTION, 1972, Illinois VAS.
104. MODERN SOYBEAN PRODUCTION, Amchem.
105. SOYBEAN PROFIT IDEAS FOR 1973, Amchem.
106. SOYBEAN FARMING, American Soybean Association.
107. SOYBEAN ROADBLOCKS, 1968, American Soybean Association.
108. APPROVED PRACTICES FOR SOYBEANS, Illinois VAS.
109. HOW A SOYBEAN PLANT DEVELOPS, Spec. Report 53, ISU Extension.
110. SOYBEANS--DESCRIPTION OF VARIETIES, Illinois Crop Improvement Association.
111. STATUS OF SOYBEAN NODULES, Plant Food Review.
112. INOCULATION OF LEGUMES, #4022, Illinois VAS.
113. SOYBEAN DISEASES AGRICULTURE HANDBOOK, #302, USDA.
114. SOYBEAN DISEASES IN ILLINOIS, Circ. 676, Illinois VAS.
115. AUDIO-TUTORIAL SYSTEMS AGROMONY SERIES, Burgess Publishing.
116. KNOW THE PLANT FOOD SOYBEANS TAKE UP, Petash Institute.
117. APPROVED PRACTICES FOR ALFALFA, 1972, Illinois VAS.
118. APPROVED PRACTICES IN FORAGE CROPS, Vol. 13, No. 9s, 1972, Pennsylvania State University.
119. FORAGE--FROM FIELD TO FEEDING, A. O. Smith.
120. IOWA ALFALFA YIELD TEST, Ag 84, ISU Extension.
121. YOU CAN FIGURE YOUR SPRING FREEZE HAZARD, FS 475, ISU Extension.
122. MERIT? A NEW LADINO CLOVER, FS 1012, ISU Extension.
123. SUDAN PROVIDES EXTRA FORAGE FOR BEEF, FS 1215, ISU Extension.



124. FORAGE CROP VARIETIES AND SEEDING MIXTURES, PM 223, ISU Extension.
125. STEM AND LEAF DISEASES OF ALFALFA AND RED CLOVER, PM 325, ISU Extension.
126. SILAGE PRODUCTION AND USE, PM 417, ISU Extension.
127. ALFALFA ANALYST, PM 537, ISU Extension.
128. REED CANARY GRASS, PM 538, ISU Extension.
129. FORAGE CROP VARIETIES, PM 564, ISU Extension.
130. SIMPLE WAY TO TEST YOUR GRAIN AND HAY FOR MOISTURE, PM 275, ISU Extension.
131. INSECTICIDES FARM MANUAL, 1969, Standard Oil.
132. CHEMICALS FARM MANUAL, 1970, Standard Oil.
133. CHEMICALS FARM MANUAL, 1971, Standard Oil.
134. HERBICIDES FARM MANUAL, 1969, Standard Oil.
135. AGRICULTURAL CHEMICAL--WHAT THEY ARE AND HOW THEY ARE USED, Manufacturing Chemists Association.
136. LOSSES FROM WEEDS, Spec. Report #13, University of Minnesota Extension.
137. WEEDS OF THE NORTH CENTRAL STATES, Circ. 718, University of Illinois Extension.
138. SUMMARY OF IOWA PEST CONTROL RECOMMENDATION, ISU Extension.
139. ERGOT, PM 563, ISU Extension.
140. CHEMICAL STORAGE HANDBOOK, CS 8, ISU Extension.
141. HERBICIDES FOR WEED CONTROL FOR CORN AND SOYBEANS, WC 86, ISU Extension.
142. THE EUROPEAN CORN BORER AND ITS CONTROL IN THE NORTH CENTRAL STATES, PM 176, ISU Extension.
143. MAKE WAR ON THISTLES, FS 1275, ISU Extension.
144. WIN THE BATTLE WITH GIANT FOXTAIL, FS 1277, ISU Extension.
145. WEEDS OF THE NORTH CENTRAL STATES, NCR 36, ISU Extension.
146. WANTED: DEAD! THE THISTLE FAMILY, WC 75, ISU Extension.
147. CONTROL GIANT FOXTAIL, WC 76, ISU Extension.
148. CORN BORERS ARE TRYING TO TELL US SOMETHING, FS 1391, ISU Extension.
149. YOUR GUIDE TO IDENTIFYING WEEDS AND GRASSES, Elanco.
150. HANDLING AND USING AGRICULTURAL CHEMICALS SAFELY, 4045, Illinois VAS.
151. INSECTICIDES: KINDS, FORMULATION, MIXING, APPLICATION, 1973, Ohio State University Ag. Ed.
152. SOME COMMON TYPES OF INSECTS, 1972, Ohio State University Ag.Ed.
153. BE PREPARED WHEN USING PESTICIDES, 1972, #1-152, Ohio State University Ag. Ed.
154. CONTROLLING WEEDS, #4042, Illinois VAS.
155. SOUTHERN CORN LEAF BLIGHT, #4051, Illinois VAS.
156. USING PRE-EMERGENCE HERBICIDES, Circ. 932, Illinois Extension.
157. WALLACES FARMER MAGAZINE, Wallaces Farmer.
158. INSECT CONTROL FOR FIELD CROPS, Circ. 899, Illinois Extension.
159. Bulletin Catalog "Publications Off The Press," Agriculture and Home Economics, Cooperative Extension Service, S.D.S.U.

Books:

1. AN INTRODUCTION TO AGRICULTURAL BUSINESS AND INDUSTRY, Weyant, Hoover and McClay, Interstate Printers.
2. AGRICULTURE: MORE THAN FARMING, Future Farmer Supply.
3. CAREERS UNLIMITED, Future Farmer Supply.
4. HANDBOOK OF AGRICULTURAL OCCUPATIONS, Hoover, 1967, Interstate.
5. PLANT SCIENCE COURSE GUIDE, University of Mo. Department of Education.
6. STUDY GUIDE FOR DRYING CORN ON THE FARM, 1970, Ohio State University Ag. Ed.
7. MODERN CORN PRODUCTION, Aldrich and Leng, 1965, Farm Quarterly,
8. INTRODUCTION TO THE STUDY OF INSECTS, Borrow and DeLong, 3rd ed., Holt, Rinehart and Winston, Inc.
9. SCIENCE FOR BETTER LIVING, Yearbook of Agriculture 1968, USDA.
10. SEEDS OF IOWA NOXIOUS AND COMMON WEEDS, 1962, Bragonier and Isley, ISU Extension.
11. FIELD CROP JUDGING, 1962, ISU Extension.
12. THAT WE MAY LIVE, Whitten, 1966, NASCO.
13. LABORATORY STUDIES IN FIELD CROP SCIENCE, Burger, Stipes.
14. INTRODUCTORY EXPERIMENTAL SOIL SCIENCE, Sabey, Stipes.
15. NOXIOUS WEEDS, Iowa Department of Agriculture.
16. FARM CROP PRODUCTION TECHNOLOGY: POST HIGH SCHOOL CURRICULUM GUIDE, DPI, Grimes State Office Building, Des Moines, Iowa.
17. COOP FERTILIZER HANDBOOK, Farmland.
18. FERTILIZER SOLUTIONS, Fertilizer Solutions.
19. BASIC CORE CURRICULUM GUIDE FOR VOC AG I, II, III, IV, Oklahoma State Department.
20. DOANE'S FARM MANAGEMENT GUIDE, Doanes.
21. SOILS AND CROPS BOOK, 12 ed., Successful Farming.
22. MIDWEST FARM PLANNING MANUAL, ISU Press.
23. MIDWEST FARM HANDBOOK, ISU Press.
24. INTRODUCTORY SOILS, Berger, Macmillan Co.
25. OUR SOILS AND THEIR MANAGEMENT, Donahue, 3rd ed., Interstate.
26. INSTRUCTIONAL MATERIALS FOR PRODUCTION AGRICULTURE FOR VOC AG I, II, III, AND IV, Texas A & M.
27. SEEDS, Yearbook of Agriculture 1961, USDA.
28. FORAGES, Hughes, Heath and Metcalf, 1962, ISU Press.
29. DICTIONARY OF OCCUPATIONAL TITLES, USDA.
30. CAREERS IN AGRIBUSINESS AND INDUSTRY, Stone, Interstate.
31. NASCO CATALOG, NASCO.
32. SPECIALIZED CURRICULUM RESOURCE UNITS #6-10 ON PLANT DISEASES, INSECTS, WEEDS, PLANT PRODUCTION MANAGEMENT, AND SOILS, University of Arizona.
33. CROPS IN WAR AND PEACE, Yearbook of Agriculture 1951, USDA.
34. INSECTS, Yearbook of Agriculture 1952, USDA.
35. PLANT DISEASES, Yearbook of Agriculture 1953, USDA.
36. CONSUMERS ALL, Yearbook of Agriculture 1965, USDA.
37. AGRICULTURAL CHEMICAL SALES AND SERVICE, Ohio State University Ag. Ed.
38. FORAGE CROPS FOR THE UPPER MIDWEST, Thomas and Briggs, Burgess Publishing.
39. WEED IDENTIFICATION AND CONTROL, Isley, 1960, ISU Press.

40. NEW HOLLAND GRASSLAND MANUAL, 1962, New Holland.
41. PRODUCTION OF FIELD CROPS, Kipps, 1970, McGraw-Hill.
42. DYNAMICS OF LAND USE, NEEDED ADJUSTMENT, 1964, ISU Press.
43. USING COMMERCIAL FERTILIZERS, McVickar, 1970, Interstate.
44. WEED BIOLOGY AND CONTROL, Muzik, 1970, McGraw-Hill.
45. SOIL-USE AND IMPROVEMENT, Stallings, 1957, Prentice-Hall.
46. SOILS-AN INTRODUCTION TO SOILS AND PLANT GROWTH, Donahue, and Robertson, 1971, Prentice-Hall.
47. FACTS AND FIGURES FOR FARMERS, 1972, Doanes.
48. PLANT SCIENCE-AN INTRODUCTION TO WORLD CROPS, Janik, Schery, Woods and Ruttan, NASCO.
49. SOIL SCIENCE SIMPLIFIED, Kohnke, NASCO.

#### SOURCES OF REFERENCES AND INSTRUCTIONAL AIDS

1. Amchem  
126 Parkade  
Cedar Falls, Iowa 50613
2. American Liberty Press  
Milwaukee, Wisconsin 53201
3. American Potash Institute, Inc.  
1102-16th Street, N. W.  
Washington, D.C. 20036
4. American Soybean Association  
Hudson, Iowa 50643
5. A. O. Smith  
Harvestore Products, Inc.  
550 W. Algonquin Road  
Arlington Heights, Illinois 60005
6. Arizona, University of  
Department of Agricultural Education  
Tucson, Arizona 85721
7. Bureau of Census  
U. S. Department of Commerce  
Washington, D. C. 20203
8. Burgess Publishing Company  
426 South 6th Street  
Minneapolis, Minnesota 55415
9. Cargill, Inc.  
Grain Exchange  
Minneapolis, Minnesota 55415
10. Chevron Chemical Company  
200 Bush Street  
San Francisco, California 94102

11. CIBA-Geigy  
P.O. Box 11422  
Greensboro, North Carolina 27409
12. Corn Refiners Association, Inc.  
1001 Connecticut Avenue, N. W.  
Washington, D. C. 20036
13. DeKalb Agricultural Research, Inc.  
Sycamore Road  
DeKalb, Illinois 60115
14. Des Moines Register and Tribune  
715 Locust Street  
Des Moines, Iowa 50304
15. Doane Agricultural Services  
8900 Manchester Road  
St. Louis, Missouri 63144
16. Elanco Products  
Eli Lilly and Company  
Indianapolis, Indiana 46206
17. Farmland Industries  
P.O. Box 7305  
Kansas City, Missouri 64116
18. Farm Quarterly  
22 East 12th Street  
Cincinnati, Ohio 54210
19. Fertilizer Institute  
1015 18th Street, N. W.  
Washington, D.C. 20202
20. Fertilizer Solutions  
910 Lehmann Building  
Peoria, Illinois 61602
21. Future Farmer Supply Service  
P.O. Box 15159  
Alexandria, Virginia 22309
22. F & W Publishing Corporation  
22 East 12th Street  
Cincinnati, Ohio 45210
23. Government Printing Office  
Northwest Regional Education Laboratory  
500 Lindsay Building  
710 West Second Avenue  
Portland, Oregon 97205

24. Hoards Dairyman  
Fort Atkinson, Wisconsin 53538
25. Holt, Rinehart and Winston, Inc.  
383 Madison Avenue  
New York, New York 10017
26. Illinois Crop Improvement Association  
508 South Broadway Street  
Urbana, Illinois 61801
27. Illinois, University of  
Agricultural Engineering Department  
Urbana, Illinois 61801
28. Illinois, University of  
Cooperative Extension Service  
Urbana, Illinois 61801
29. Illinois, University of  
Extension Entomology  
Urbana, Illinois 61801
30. Illinois, University of  
Vocational Agriculture Service  
434 Mumford Hall  
Urbana, Illinois 61801
31. Interstate Printers and Publishers  
Danville, Illinois 61832
32. Iowa Crop Improvement Association  
112 Agronomy Building  
Ames, Iowa 50010
33. Iowa Department of Agriculture  
Federal Building, Room 855  
210 Walnut Street  
Des Moines, Iowa 50309
34. Iowa Department of Public Instr.  
Career Education Division  
Grimes State Office Building  
Des Moines, Iowa 50319
35. Iowa Development Commission  
250 Jewett Building  
Des Moines, Iowa 50309
36. Iowa Soil Conservation Service  
832 Federal Building  
Des Moines, Iowa 50309

37. Iowa State University  
Agronomy Club  
112 Agronomy Building  
Ames, Iowa 50010
38. Iowa State University  
Cooperative Extension Service  
Ames, Iowa 50010
39. Iowa State University  
Media Resources Center  
212 Pearson Hall  
Ames, Iowa 50010
40. Iowa State University  
University Press  
Press Building  
Ames, Iowa 50010
41. John Deere Film Library  
C/O Modern Talking Pictures  
2323 New Hyde Park Road  
New Hyde Park, L. I., New York 11041
42. John Deere  
The Furrow  
1400 3rd Avenue  
Moline, Illinois 61265
43. Kent Feeds, Inc.  
Muscatine, Iowa 52761
44. McGraw-Hill  
Princeton Road  
Hightstown, New Jersey 08520
45. Macmillan Company  
New York, New York 10011
46. Manufacturing Chemists Assoc., Inc.  
1825 Connecticut Avenue, N. W.  
Washington, D.C. 20006
47. Maryland State Department of Public Instruction  
Department of Vocational-Technical Education  
P.O. Box 8718  
Friendship International Airport  
Baltimore, Maryland 21240
48. Minnesota, University of  
Minnesota Extension Service  
Minneapolis, Minnesota 55455

49. Missouri, University of  
State Department of Education  
Columbia, Missouri 65201
50. Missouri, University of  
Instructional Materials Laboratory  
Department of Practical Arts & Vo-Tech Ed.  
Columbia, Missouri 65201
51. Modern Talking Pictures, Inc.  
Cedar Rapids, Iowa 52406
52. NASCO, Inc.  
Fort Atkinson, Wisconsin 53538
53. National Plant Food Institute  
1700 K Street, N. W.  
Washington, D.C. 20006
54. New Holland Machine Company  
Division of Speery Rand Corp.  
New Holland, Pennsylvania 17557
55. Ohio State University  
Department of Agricultural Ed.  
2120 Fyffe Road  
Columbus, Ohio 43210
56. Ohio State University  
Cooperative Extension Service  
Columbus, Ohio 43201
57. Oklahoma State Department of Instr.  
Vocational and Technical Education  
Stillwater, Oklahoma 74074
58. PAG Division  
W. R. Grace and Company  
Aurora, Illinois 60507
59. Pennsylvania State University  
Department of Agricultural Educ.  
102 Armsby  
University Park, Pennsylvania 16802
60. Potash Institute  
1649 Tullie Circle, N. E.  
Atlanta, Georgia 30329
61. Prentice-Hall, Inc.  
Englewood Cliffs, New Jersey 07632

62. Quaker Oats Company  
Donald J. Schrickel, Manager  
Grain Development  
Chicago, Illinois 60601
63. Standard Oil Division  
American Oil Company  
Farm and Home Department  
P.O. Box 4040  
St. Paul, Minnesota 55116
64. Sterling Movies Production  
43 West 61st Street  
New York, New York 10023
65. Stipes Agricultural List  
Stipes Publishing Company  
10-12 Chester Street  
Champaign, Illinois 61820
66. Successful Farming  
Reader Service  
1716 Locust Street  
Des Moines, Iowa 50303
67. Texas A & M University  
Texas Instruction Services  
F.E. Box 182  
College Station, Texas 77843
68. 3 M Company  
Educational Services  
Box 3100  
St. Paul, Minnesota 55101
69. Office of Information  
U.S.D.A.  
Washington, D.C. 20250
70. Venard Organization  
Peoria, Illinois 61601
71. Vocational Education Media Center  
Clemson University  
Clemson, South Carolina 29631
72. Vocational Education Productions (VEP)  
California State Polytechnic College  
San Luis Obispo, California 93401
73. Wallaces Farmer  
1912 Grand Avenue  
Des Moines, Iowa 50305



74. Weeds, Trees, and Turf  
9800 Detroit Avenue  
Cleveland, Ohio 44102
75. Wisconsin Department of Public Instruction  
126 Langdon Street  
Madison, Wisconsin 53702
76. Bulletin Room  
Extension Building  
South Dakota State University  
Brookings, South Dakota 57006

#### Content Outline

##### AG BUSINESS MANAGEMENT, ECONOMICS AND MARKETING

- I. Occupational Opportunities
- II. Farm Business Goals
- III. Records and Records Analysis
  - A. Importance of Records
  - B. Depreciation
  - C. Inventory
- IV. Tax Management
  - A. Tax computation
  - B. Social Security Computation
- V. Credit and money management
- VI. Estate Planning
- VII. Farm Business Organization
- VIII. Land Acquisition
- IX. Budgeting
- X. Farm Organizations
- XI. Marketing
  - A. Marketing methods
  - B. Exports and Imports

- XII. Economic Principles
- XIII. Government and other agencies
  - A. Farm Programs
  - B. Commodity Organizations
- XIV. Insurance
- XV. Agricultural Mathematics
- XVI. Agricultural Law

#### Suggested Source Materials

##### Bulletins:

1. MECHANICS OF FARM FINANCIAL PLANNING, Circular 1042; University of Illinois.
2. TEACHER'S GUIDE TO FARM MONEY MANAGEMENT, 1972; Ohio State University.
3. DETERMINING CREDIT NEEDS ON THE FARM, 2025a; Illinois Vo-Ag Service.
4. PLANNING FOR REPAYMENT OF LOANS, 2026a; Illinois Vo-Ag Service.
5. SOURCES OF FARM CREDIT, 2027a; Illinois Vo-Ag Service.
6. USING CREDIT TO INCREASE FARM EARNINGS, 2024a; Illinois Vo-Ag Service.
7. COOPERATIVES IN BUSINESS, USDA.
8. HOW TO START A COOPERATIVE, USDA.
9. MEASURING COOP DIRECTORS, USDA.
10. WHAT ARE COOPERATIVES? USDA.
11. FARMER COOPERATIVES...FARM BUSINESS TOOLS, USDA.
12. WAYS FARMERS DO BUSINESS, USDA.
13. THE FARM CORPORATION, PM 273; Iowa State University.
14. CAPITALISM, SOCIALISM, COMMUNISM, 2038; Illinois Vo-Ag Service.
15. TOWARDS A LONG-RANGE SOLUTION TO THE COMMERCIAL FARM PROGRAM, FS-1155; Iowa State University.
16. OUR CAPACITY TO PRODUCE, FS-1264; Iowa State University.
17. WHICH FARM PROGRAM TO CONTROL OUR OVERCAPACITY, FS-1269; Iowa State University.
18. FARM POLICIES AND OUR RURAL COMMUNITIES, FS-1335; Iowa State University.
19. AMOUNT AND COSTS OF ALTERNATIVE LAND RETIREMENT PROGRAMS, FS-1372; Iowa State University.
20. FARM PROGRAMS, PRICE SUPPORTS AND IOWA FARMS, FS-1376; Iowa State University.
21. WHAT BARGAINING POWER FOR FARMERS, FS921; Iowa State University.
22. WHAT FARM EXPORTS MEAN TO THE UPPER MIDWEST, PM 342; Iowa State University.
23. MARKETING AGRICULTURAL PRODUCTS, 2016a; Illinois Vo-Ag Service.
24. HOW PRICES OF MEAT ANIMALS ARE ESTABLISHED, 2032; Illinois Vo-Ag Service.

25. TRENDS IN LIVESTOCK BUILDING, FS-1066; Iowa State University.
26. FACTORS INFLUENCING FARM FIELD COSTS, FS1198; Iowa State University.
27. LEASING VS OWNING, FS1371; Iowa State University.
28. CUSTOM RATES PAID, PM521; Iowa State University.
29. FITTING MACHINERY AND EQUIPMENT TO THE FARM, 2039; Illinois Vo-Ag Service.
30. FARM LABOR PAY PACKAGES, FS1373; Iowa State University.
31. PROBLEMS OF HIRING AND KEEPING FULL-TIME FARM EMPLOYEES, FS1380; Iowa State University.
32. KEEPING FULL-TIME FARM EMPLOYEES, FS1380; Iowa State University.
33. BALANCING THE LABOR SUPPLY AND THE FARM BUSINESS, 2035; Illinois Vo-Ag Service.
34. CASH WAGES AND PREREQUISITES RECEIVED, SB 438; USDA.
35. FARM LABOR INPUTS, SB438; USDA.
36. THE PARADOX OF FARM LABOR, FS1364; Iowa State University.
37. FARMER'S TAX GUIDE, INTERNAL REVENUE SERVICE NO. 225; Understanding Taxes, Student Farm Edition, IRS No 22; Teachers Guide, IRS No. 19.
38. FARM MANAGEMENT MANUAL, Standard Oil.
39. FARM BUSINESS PLANNING AND ANALYSIS FILING SYSTEM, 1971; Ohio State University.
40. APPRAISING FARM BUILDINGS, 3017a; Illinois Vo-Ag Service.
41. SOCIAL SECURITY AMENDMENTS - IMPORTANCE TO FARM AND RURAL PEOPLE, Economic Research Service No. 257; USDA.
42. TIPS FOR TEACHING HEALTH INSURANCE AND LIFE INSURANCE, Educational Division; Institute of Life Insurance.
43. WHAT SHOULD MY INSURANCE COVER, No. 231; Pennsylvania State University.
44. INSURANCE IN THE FARM BUSINESS, No. 1003; New York State College of Agriculture.
45. PLANNING FARM PROPERTY TRANSFERS WITHIN FAMILIES IN IOWA, P125; (Revised 1966) Iowa State University.
46. ESTATE PLANNING, Rev, Ser ember 1972; University of Illinois.
47. TEACHING UNITS IN LEGAL ASPECTS OF FARM BUSINESS MANAGEMENT, Purdue Univeristy.
48. USING FARM REAL ESTATE LOANS, 2033; Illinois Vo-Ag Service.
49. Bulletin Catalog "Publications off the Press," Agriculture and Home Economics, Cooperative Extension Service, SDSU.

Books:

1. AN INTRODUCTION TO AGRICULTURAL BUSINESS AND INDUSTRY, Weyant, Hoover, and McClay 1971; Interstate.
2. HANDBOOK OF AGRICULTURAL OCCUPATIONS, Hoover, 1969; Interstate.
3. CAREERS IN AGRI-BUSINESS AND INDUSTRY, Stone, 1971; Interstate.
4. DOANES DIGEST, Doanes Agricultural Service.
5. PLANNING MACHINERY PROTECTION, No. 402; AAVIM.
6. PRINCIPLES OF FARM ACCOUNTING AND BUSINESS ANALYSIS, Sidney James, 1970; Iowa State University.
7. FARM RECORDS AND ACCOUNTING, Hopkins and Heady, 5th Edition; Iowa State University.
8. FARM APPRAISAL, Murray, 1969; Iowa State University.
9. FREDDIE COMPUTER, Iowa Farm Bureau.

10. BETTER FARM ACCOUNTING, Howell, 1972; Iowa State University.
11. MACHINES FOR POWER FARMING, Stone and Gulvin, 1967; John Wiley & Sons, Inc.
12. FARM POWER AND MACHINERY MANAGEMENT, Hunt, Sixth Edition; Iowa State University.
13. FINANCIAL MANAGEMENT IN AGRICULTURE, Hopkin, Barry & Baker, 1973; Interstate.
14. EXPERIENCE PROGRAMS FOR LEARNING VOCATIONS IN AGRICULTURE, Binkley and Hammonds, 1970; Interstate.
15. FARM ESTATE & BUSINESS PLANNING, Harl, 1973; Agri-Business Publications.

#### SOURCES OF REFERENCES AND INSTRUCTIONAL AIDS

1. AAVIM  
Engineering Center  
Athens, Georgia 30602
2. Agri-Business Publications  
1920 Waukegan Road  
Glenview, Illinois 60025
3. Doanes Agricultural Service, Inc.  
8900 Manchester Road  
St. Louis, Missouri 63144
4. Farm Credit Banks of St. Paul  
St. Paul, Minnesota 55101
5. Felco Land-O-Lakes  
Ft. Dodge, Iowa 50501
6. Farm Credit Banks of Omaha  
Omaha, Nebraska
7. Illinois Vo-Ag Service  
College of Agriculture  
University of Illinois  
434 Mumford Hall  
Urbana, Illinois 61801
8. Institute of Life Insurance  
277 Park Avenue  
New York, New York 10017
9. Aberdeen District Office  
Internal Revenue Service  
P.O. Box 370  
Aberdeen, South Dakota 57401
10. Iowa Beef Producers (Cattleman's) Association  
Airport Road  
Ames, Iowa 50010

11. Iowa Dairy Association  
Ankeny, Iowa 50021
12. Iowa Farm Bureau  
5400 University Avenue  
West Des Moines, Iowa 50265
13. Iowa State University  
Media Resources Center  
121 Pearson Hall  
Ames, Iowa 50010  
  
Publications Distribution Center  
Printing and Publications Building  
Ames, Iowa 50010  
  
IAVIM Center  
Attention: Thomas A. Hoerner  
Agricultural Engineering Department  
Iowa State University  
Ames, Iowa 50010  
  
ISU Press  
Ames, Iowa 50010
14. Iowa Poultry Association  
535 East Lincoln Way  
Ames, Iowa 50010
15. Iowa Turkey Federation  
535 East Lincoln Way  
Ames, Iowa 50010
16. John Wiley & Sons, Inc.  
605 Third Avenue  
New York, New York 10016
17. Kentucky, University of  
Lexington, Kentucky 40506
18. Montana State University  
Bozeman, Montana 59715
19. NASCO  
Fort Atkinson, Wisconsin 53538
20. Nebraska, University of  
Lincoln, Nebraska 68508
21. New York State College of Agriculture  
Ithaca, New York 14850

22. Ohio State University  
Curriculum Materials Service  
Room 201  
2120 Fyffe Road  
Columbus, Ohio 43210
23. Pennsylvania State University  
Department of Agricultural Education  
University Park, Pennsylvania 16802
24. Pork Producers Association  
4715 Grand Avenue  
Des Moines, Iowa 50312
25. Purdue University  
Lafayette, Indiana 47907
26. American Soybean Association  
Hudson, Iowa 50643
27. Standard Oil Division  
American Oil Company  
Farm and Home Department  
P.O. Box 4040  
St. Paul, Minnesota 55116
28. Successful Farming  
Meredith Publishers  
1716 Locust Street  
Des Moines, Iowa 50309
29. United States Department of Agriculture  
Publications Division  
Office of Information  
Washington, D.C. 20250
30. U.S. Department of Health, Education and Welfare  
Washington, D.C. 20202
31. Vocational Education Productions  
California Polytechnic State University  
San Luis Obispo, California 93401
32. Bulletin Room  
Extension Building  
South Dakota State University  
Brookings, South Dakota 57006

## 2. Agricultural Supplies/Services (01.02)

### Example Performance Objectives:

1. When given a specific job in which the student is interested, the student will be able to list, with complete accuracy and completeness, the competencies and requirements needed by persons to enter and advance in that career in agricultural supplies and services.
2. When presented a problem requiring the application of fertilizer supplied nutrients, the student will be able to list at least three sources, with 100 per cent accuracy, which will supply the required nutrients.
3. When provided information regarding the weed problem to be controlled by the use of chemicals, the student will correctly ascertain the appropriate chemicals to be used and calculate the correct amount needed, in accordance with the chemical company's recommendations.

### Occupational Titles

Instructional programs based upon content in this guide will prepare individuals for job entry, will upgrade occupational skills, or will prepare the learner for further occupational preparation.

Farm Supply Center Manager	Farm Supply Center Worker
Farm Supply Production Manager	Parts Man
Farm Supply Sales Manager	Grain Elevator Man
Farm Supply Service Manager	Grain Grader
Farm Supply Office Manager	Grain Inspector
Farm Supply Company Research and Development Director	Feed Specialist
Farm Supply Company Fieldman	Seed Technician
Farm Supply Center Bookkeeper	Animal Health Supply Salesman
Farm Supply Salesman	Veterinarian's Assistant
Farm Supply Serviceman	Pest Exterminator
Farm Supply Applicator	Pest Exterminator Supervisor
Farm Supply Equipment Operator	Weed Inspector
Farm Supply Warehouseman	Grain Hauling Contractor
Farm Supply Center Deliveryman	Grain Hauler
Farm Supply Center Sales Clerk	Custom Pesticide Applicator
Farm Supply Center Stock Clerk	Farm Supply Order Clerk
Feed Mill Employee	Farm Supply District Salesman
Petroleum and Related Products Route Salesman	Pet Center Sales Clerk
Agricultural Chemical Fieldman	Warehouse Foreman
	Public Relations Specialist
	Route Salesman

(Farm supplies include feed, fertilizer, chemicals, seeds, animal health products, petroleum and related products, hardware, lumber, and farm machinery and other equipment.)

## Content Outline

- I. Orientation to off-farm Agribusiness Occupations
  - A. Occupational Opportunities
  - B. Competencies Needed
  - C. Securing a Job
  - D. Occupational Experience and Related Instruction
- II. Organization and Operation of Agriculture Business and Industry
  - A. Community Needs
  - B. Business Organization  
(Ways of doing business)
  - C. Business Operation and Management
    - 1. Credit
    - 2. Purchasing
    - 3. Records
    - 4. Depreciation
    - 5. Insurance
    - 6. Personnel Management
    - 7. Taxes
    - 8. Others
  - D. Government Regulations
    - 1. Safety
    - 2. Employment Security
    - 3. Consumer Protection
    - 4. Other
- III. Ag Math
  - A. Calculating and writing sales orders
  - B. Calculating % markup, selling price, and profit.
  - C. Determining %, amount, and cost of rations, fertilizers, chemicals and seeds.
  - D. Determine amount and cost of building supplies.
  - E. Computing interest
  - F. Calculate storage capacities
  - G. Calculate land areas
  - H. Figuring costs of production



- IV. Human Relations and Personality Traits
  - A. Dealing with Co-Workers
  - B. Dealing with Employer or Supervisor
  - C. Dealing with the Public
  - D. Desirable Personality Traits
  - E. Communications Skills
- V. Merchandising Skills
  - A. Knowledge of Merchandise
  - B. Inventory Procedures
  - C. Merchandise display, advertising, storage, and handling
  - D. Operation of in-store equipment
  - E. Housekeeping and security
  - F. Business Accounting
- VI. Salesmanship and Selling
  - A. Understanding the customer
  - B. Attributes of a sales person
  - C. Product knowledge in the selling process
  - D. Locating prospective customers
  - E. Steps in making the sale
  - F. Evaluation of selling procedures
- VII. Feeds (01.02.02)
  - A. Utilization of Feeds and Feedstuffs by Livestock and Poultry
  - B. Providing Nutrients for Livestock and Poultry
  - C. Formulating Feed Mixture
  - D. Preparing Feeds in the Feed Mill
  - E. Pick Up and Delivery
  - F. Warehousing Feed
  - G. Regulations in Formulating and Labeling Feed

- iii. Fertilizers (01.02.04)
  - A. Formulations of Fertilizers
  - B. Utilization of Fertilizers and Lime Materials
  - C. Determining Fertilizer and Lime Needs
  - D. Applying Fertilizer
  - E. Handling and Storing Fertilizers
- IX. Seeds (01.02.03)
  - A. Quality Control Regulations in the Seed Industry.
  - B. Making Seed Recommendations
  - C. Seed Processing
  - D. Storage and Handling of Seeds
  - E. Quality Seed Production
- X. Chemicals (01.02.01)
  - A. Utilizing Chemicals for Agricultural Problems
  - B. Preparing Chemical Solutions for Agricultural Purposes
  - C. Applying Agricultural Chemicals
  - D. Observing Safety Precautions in Handling Agricultural Chemicals
  - E. Bulk Storage
- XI. Animal Health and Care (01.02.99)
  - A. Nature and Causes of Diseases
  - B. Feed and Exercise Requirements
  - C. Sanitation Practices
  - D. Feeding Practices
  - E. Drug Handling and Care
  - F. Surgical Instruments and Terminology
  - G. Animal Anatomy and Physiology
  - H. Post Mortems
  - I. Procedures in Animal Health and Care

## XII. Grain and Livestock Marketing (01.04.01)

(See Section on Agricultural Products)

## Suggested Source Materials

Bulletins:

1. OPPORTUNITIES IN AGRICULTURAL OCCUPATIONS AND THE EMPLOYEE WITHIN THE BUSINESS ORGANIZATION, 1971; Ohio State University.
2. OPPORTUNITIES IN SUPPLIES AND SERVICE AND IN PRODUCTION, Agriculture Kit; University of Illinois.
3. AGRICULTURAL JOB CLASSIFICATIONS; University of Missouri.
4. PLANNING FOR A CAREER IN AGRICULTURE, Student Handbook and Teacher's Guide; Pennsylvania State University.
5. APPLYING FOR A JOB, VAS 6001; University of Illinois.
6. DECIDING ON AND LOCATING YOUR KIND OF JOB, 1971; Ohio State University.
7. GETTING YOUR JOB, 1971; Ohio State University.
8. AGRICULTURE IS MORE THAN FARMING; The Future Farmers' Supply Service.
9. THERE'S A FUTURE IN YOUR FARM BACKGROUND; The National Sales Executives, Inc.
10. YOUR FARM BACKGROUND AND AGRI-BUSINESS SELLING; Sales and Marketing Executive International.
11. IMPROVING HUMAN RELATIONS; National Association of Manufacturers.
12. HUMAN RELATIONS IN BUSINESS, 1971; Ohio State University.
13. HUMAN RELATIONS IN AGRICULTURAL BUSINESS, VAS 6003; University of Illinois.
14. HUMAN RELATIONS IN AGRICULTURAL OCCUPATIONS; Iowa State University
15. SALESMANSHIP IN AGRICULTURAL OCCUPATIONS; Iowa State University.
16. BUSINESS PROCEDURES IN AGRICULTURAL OCCUPATIONS; Iowa State University.
17. SELLING AND SALESMANSHIP; Ohio State University.
18. SALESMANSHIP IN AGRICULTURAL BUSINESS, VAS 6003; University of Illinois.
19. STUDENT STUDY GUIDE ON SALESMANSHIP AND SELLING; University of Kentucky.
20. THE BASIC STEPS IN SELLING; Pennsylvania State University.
21. SMOOTH SELLING SALES TRAINING COURSE, 152 Pamphlets on Selling; George N. Kohn Company.
22. OFFICE PROCEDURES USED IN THE AGRICULTURAL SERVICES, 1973; Ohio State University.
23. MARKETING AGRICULTURAL PRODUCTS; Ohio State University.
24. BUSINESS PRACTICES FOR AGRICULTURAL MACHINERY DEALERS, 1969; Ohio State University.
25. STUDENT STUDY GUIDE ON STORE SKILLS; University of Kentucky.
26. THE USE OF THE CASH REGISTER, VAS 6005; University of Illinois.
27. AGRICULTURAL BUSINESS PROCEDURES, VAS 6004; University of Illinois.
28. BETTER COMMUNICATIONS IN SMALL BUSINESS, SBA 1.12:7: Small Business Administration.

29. A HANDBOOK OF SMALL BUSINESS FINANCE, SBA 1.12:15; Small Business Administration.
30. GUIDES FOR PROFIT PLANNING, SBA 1.12:25; Small Business Administration.
31. PERSONNEL MANAGEMENT GUIDE FOR SMALL BUSINESS, SBA 1.12:26; Small Business Administration.
32. FINANCIAL RECORDKEEPING FOR SMALL STORES, SBA 1.12:32; Small Business Administration.
33. SELECTING ADVERTISING MEDIA - A GUIDE FOR SMALL BUSINESS, SBA 1.12:34; Small Business Administration.
34. CUSTOMER CREDIT MANAGEMENT IN AGRICULTURAL BUSINESS, VAS 6008; University of Illinois.
35. AGRICULTURAL CREDIT INSTRUMENTS, VAS 6007; University of Illinois.
36. CREDIT, Farmland Industries, Inc.
37. CREDIT, 1971; Ohio State University.
38. BUSINESS MONEY MANAGEMENT, 1971; Ohio State University.
39. INVENTORY MANAGEMENT AND CONTROL, VAS 6010; University of Illinois.
40. AGRICULTURAL BUSINESS MANAGEMENT - PRINCIPLES THAT AFFECT PRODUCTION, VAS 2040; University of Illinois.
41. OPERATIONS, Farmland Industries, Inc.
42. BUDGETING, Farmland Industries, Inc.
43. ADVERTISING AND PROMOTION, 1971; Ohio State University.
44. SIMPLIFYING WORK IN AN AGRICULTURAL BUSINESS, VAS 6006; University of Illinois.
45. FEEDS, 1972; Ohio State University.
46. AGRICULTURAL CHEMICALS, 1972; Ohio State University.
47. FEED SALES AND SERVICEMAN, Texas A & M University.
48. FERTILIZER SALES AND SERVICEMAN, Texas A & M University.
49. VETERINARY ASSISTANT, Texas A & M University.
50. AGRICULTURAL CHEMICALS SALES AND SERVICEMAN, Texas A & M University.
51. PURINA HEALTH PRODUCTS AND BIOLOGICS, Ralston Purina Company.
52. BATTERY SERVICE MANUAL, Association of Battery Manufacturers.
53. COOP TRUCK TIRE DATA BOOK AND COOP FARM TIRE HANDBOOK, National Cooperatives, Inc.
54. CARE AND OPERATION OF THE PETROLEUM BULK PLANT, Farmland Industries, Inc.
55. MEET MR. TIRE SALESMAN, Farmland Industries, Inc.
56. GUARANTEE POLICY, Farmland Industries, Inc.
57. OPERATING AND MAINTENANCE INSTRUCTIONS FOR GASOLINE TRUCK TANKS AND PUMPING EQUIPMENT, Farmland Industries, Inc.
58. LUBRICANTS, YOUR GUIDE TO BETTER LUBRICATION; Farmland Industries, Inc.
59. TRACTOR FUELS AND LUBRICANTS SELECTING, STORING, OPERATING AND MAINTENANCE MANUAL; Farmland Industries, Inc.
60. BEEF COW MANAGEMENT CALENDAR, AS 373; Iowa State University.
61. THE BEEF COW-CALF HERD IN IOWA - HERD HEALTH, Pm 400; Iowa State University.
62. HANDLING AND FEEDING NEW FEEDER CATTLE, Pm 401; Iowa State University.
63. PRECONDITIONING FEEDER CATTLE, Pm 402; Iowa State University.

64. BASIC FEEDLOT NUTRITION; Pm 555; Iowa State University.
65. RATIONS FOR DAIRY COWS AND HEIFERS, Pm 318; Iowa State University.
66. LIFE CYCLE SWINE NUTRITION, Pm 489; Iowa State University.
67. IOWA SOYBEAN YIELD TEST REPORT, AG 18; Iowa State University.
68. OAT VARIETY PERFORMANCE, AG 10; Iowa State University.
69. IOWA ALFALFA YIELD TEST, AG 84; Iowa State University.
70. TAKE A GOOD SOIL SAMPLE, Pm 237; Iowa State University.
71. UNDERSTANDING YOUR SOIL TEST REPORT, Pm 429; Iowa State University.
72. FERTILIZER SUGGESTIONS FOR CORN YIELDS ABOVE 125 BUSHEL PER ACRE, ST 5; Iowa State University.
73. HERBICIDES FOR WEED CONTROL IN CORN AND SOYBEANS, WC 86; Iowa State University.
74. AGDEX, A SYSTEM FOR CLASSIFYING, INDEXING, AND FILING AGRICULTURAL PUBLICATIONS, 1969; American Vocational Association.
75. FEED ADDITIVE COMPENDIUM: Miller Publishing Company
76. Bulletin Catalog "Publications Off the Press" Agriculture and Home Economics, Cooperative Extension Service, SDSU.

Books:

1. ESSENTIAL ASPECTS OF CAREER PLANNING AND DEVELOPMENT, Atherton and Mumphrey, 1969; Interstate.
2. HANDBOOK OF AGRICULTURAL OCCUPATIONS, Hoover, 1969; Interstate.
3. EXPERIENCE PROGRAMS IN AGRICULTURE, Brinkley and Hammonds, 1970; Interstate.
4. THE ART AND SKILL OF GETTING ALONG WITH PEOPLE, Duvall; Prentice-Hall, Inc.
5. CONTACT, A TEXTBOOK IN APPLIED COMMUNICATIONS, 1970; Prentice-Hall, Inc.
6. CALL ME MISTER, James; Milady Publishing Corporation.
7. HOW TO WIN FRIENDS AND INFLUENCE PEOPLE, Carnegie, Dale; Simon and Schuster.
8. HOW TO STOP WORRYING AND START LIVING, Carnegie, Dale; Simon and Schuster.
9. HUMAN RELATIONS, PROGRAMED TEXT; Kansas State Teacher's College.
10. SUCCESSFUL SALESMANSHIP, Ivey, Horvath, and Tanning, 1965; Prentice-Hall, Inc.
11. FUNDAMENTALS OF SELLING, Wingate and Nolan, Ninth Edition; Southwestern Publishing Company.
12. CREATIVE SELLING, Johnson; Southwestern Publishing Company.
13. STORE SALESMANSHIP, Robinson and others, Prentice-Hall.
14. APPLIED BUSINESS MATHEMATICS, Piper, Fairbank, and Gruber, Ninth Edition.
15. MATHEMATICS SKILL BUILDER, Gossage and Briggs, Third Edition; Southwestern Publishing Company.
16. RETAIL MERCHANDISING, Wingate and Samson, Seventh Edition; Southwestern Publishing Company.
17. AGRICULTURAL MATHEMATICS, Higgs and others, 1973; Interstate.
18. AN INTRODUCTION TO AGRICULTURAL BUSINESS AND INDUSTRY, Weyant, Hoover, and McClay; Interstate.

19. AN INTRODUCTION TO AGRI-BUSINESS MANAGEMENT, Wills, 1973; Interstate.
20. ANCHOR VETERINARY HANDBOOK, Tenth Edition; Anchor Laboratories, Inc.
21. ECONOMICS APPLICATIONS TO AGRICULTURE AND AGRI-BUSINESS, Roy, Certy, and Sullivan; Interstate.
22. MODERN CORN PRODUCTION, Aldrich and Long; F and W Publishing Corporation.
23. COOP FERTILIZER HANDBOOK, Farmland Industries, Inc.
24. ANIMAL SCIENCE AND INDUSTRY, Acker; Prentice Hall, Inc.
25. FARM ESTATE BUSINESS PLANNING, Harl, 1973; Agri-Business Publications.
26. BOOKKEEPING FUNDAMENTALS, Fritz and Hoffman, McGraw-Hill Book Company.
27. CENTURY 21 ACCOUNTING, Boynton and others, Southwestern Publishing Company.
28. EVERYDAY FARM LAWS, Adams and Bedford; Interstate.
29. LAW AND COURT DECISIONS ON AGRICULTURE, Krausy and Hannah; Stipes Publishing Company.
30. DOANE'S FARM MANAGEMENT GUIDE, Ninth Edition; Doane Agricultural Service, Inc.

#### SOURCES OF REFERENCES AND INSTRUCTIONAL AIDS

1. Addison-Wesley Publishing Company  
Reading, Massachusetts 01867
2. Agri-Business Publications  
Book Division  
1920 Waukegan Road  
Glenview, Illinois 60025
3. American Vocational Association  
Publications Department  
1510 H Street, N.W.  
Washington, D.C. 20005
4. Anchor Laboratories, Inc.  
Division of Philips Roxane, Inc.  
St. Joseph, Missouri 64502
5. Area Vocational Technical School  
Coordinator Vocational Materials Center  
Staples, Minnesota 56479
6. The Association of Battery Manufacturers  
19 North Harrison Street  
East Orange, New Jersey 07017
7. California State Polytechnic College  
Vocational Education Productions  
San Luis Obispo, California 93401

8. California, University of  
Audio-Visual Center  
Berkeley, California 94720
9. Copley Production Distribution Center  
434 Downer Place  
Aurora, Illinois 60506
10. DCA Educational Products, Inc.  
4865 Stenton Avenue  
Philadelphia, Pennsylvania 19144
11. Doane Agricultural Service, Inc.  
8900 Manchester Road  
St. Louis, Missouri 63144
12. Eastman Kodak Company  
Audio-Visual Service  
343 State Street  
Rochester, New York 14650
13. Encyclopedia Britannica Films  
1150 West Wilmette Avenue  
Wilmette, Illinois 60091
14. Farm Film Foundation  
1425 H Street, N.W.  
Washington, D.C. 20005
15. Farmland Industries, Inc.  
3315 N. Oak Trfwy.  
Kansas City, Missouri 64116
16. Future Farmer Supply Service  
P.O. Box 15159  
Alexandria, Virginia 22309
17. F & W Publishing Corporation  
22 East 12th Street  
Cincinnati, Ohio 45210
18. Goals Unlimited, Inc.  
Amarillo, Texas 79100
19. Illinois, University of  
Vocational Agriculture Service  
434 Mumford Hall  
Urbana, Illinois 61801
20. Interstate Printers and Publishers  
Danville, Illinois 61832

21. Iowa Grain and Feed Association  
201 Shops Building  
Des Moines, Iowa 50309
22. Iowa State University  
Publications Distribution Center  
Printing and Publications Building  
Ames, Iowa 50010
23. IAVIM Center  
Attention: Thomas A. Hoerner  
Agricultural Engineering Department  
Iowa State University  
Ames, Iowa 50010
24. Kahn, George N. Company  
Sales Training Division  
212 Fifth Avenue  
New York, New York 10010
25. Kansas State Teacher's College  
Emporia, Kansas 66801
26. Kent Feeds, Inc.  
Muscatine, Iowa 52761
27. Kentucky, University of  
Department of Vocational Education  
College of Education  
Lexington, Kentucky 40500
28. Kirkwood Community College  
Bookstore  
Box 2068  
Cedar Rapids, Iowa 52406
29. McGraw-Hill Book Company  
Princeton Road  
Hightstown, New Jersey 08520
30. Milady Publishing Corporation  
3829 White Plains Road  
Bronx, New York 10467
31. Missouri, University of  
Instructional Materials Laboratory  
8 Industrial Education Building  
Columbia, Missouri 65210
32. Modern Talking Pictures, Inc.  
Cedar Rapids, Iowa 52406
33. Movies USA, Inc.  
729 Seventh Avenue  
New York, New York 10000



34. Miller Publishing Company  
2501 Wayzata Blvd.  
Minneapolis, Minnesota 55440
35. National Association of Manufacturers  
277 Park Avenue  
New York, New York 10010
36. National Cooperatives, Inc.  
Albert Lea, Minnesota 56007
37. Northwestern Bell Telephone Company  
Des Moines, Iowa 50309
38. National Sales Executives, Inc.  
630 Third Avenue  
New York, New York 10017
39. Ohio State University  
Department of Agricultural Education  
2120 Fyffe Road  
Columbus, Ohio 43210
40. Oklahoma State Department of Vocational and Technical Education  
The Curriculum and Instructional Materials Center  
1515 West Sixth Avenue  
Stillwater, Oklahoma 74074
41. Pennsylvania State University  
Department of Agricultural Education  
University Park, Pennsylvania 16802
42. Prentice-Hall, Inc.  
Englewood Cliffs, New Jersey 07632
43. Ralston Purina Company  
Checkerboard Square  
St. Louis, Missouri 63199
44. Sales and Marketing Executive International  
630 Third Avenue  
New York, New York 10017
45. Simon and Schuster, Inc.  
630 Fifth Avenue  
New York, New York 10020
46. Small Business Association  
609 Federal Building  
210 Walnut Street  
Des Moines, Iowa 50309
47. South-Western Publishing Company  
5101 Madison Road  
Cincinnati, Ohio 45227

48. Successful Farming Vo-Ag Service  
1716 Locust Street  
Des Moines, Iowa 50303
49. Texas A & M University  
F. E. Box 182  
College Station, Texas 77843
50. Watt Publishing Company  
Mount Morris, Illinois 61054
51. Bulletin Room  
Extension Building  
South Dakota State University  
Brookings, South Dakota 57006

### 3. Agricultural Mechanics (01.03)

#### Example Performance Objectives:

1. The student will be able to clean, gap and install a small gas engine spark plug, given a faulty spark plug, spark plug wrench, gap gauge, cleaning materials and a functioning small gas engine. Above to be completed in 20 minutes. Points will be deducted for each .001 error.
2. The student will be able to layout a given pitch rafter accurate for use as a pattern utilizing a length of 2"x4", framing square, steel tape, rafter tables and pencil within 5 minutes. For each 1/8" error 2 points will be deducted.
3. The student will be able to back up 10 feet and park a tractor and four wheel farm wagon in a space 8 inches wider than the wagon within a time limit of 8 minutes. For each 1/2 inch off center 5% of the points allowed will be deducted.

#### Occupational Titles:

Instructional programs based upon content in this guide will prepare individuals for job entry, will upgrade occupational skills, or will prepare learners for further occupational preparation.

#### Professional

Research Engineer  
Plant-Research Engineer  
Field-Research Engineer  
Plant-Production Engineer  
Research Draftsman

#### Skilled

Mechanic  
Partsman  
Welder  
Machinist  
Bodyman  
Mechanic and Truck Driver

Technical

Assistant Research Engineers  
Machinery Designer  
Machinery Fieldman

Managerial

General Manager  
Sales Manager  
Parts Manager  
Service Manager  
Manager  
Assistant Manager  
Owner-Manager  
Warehouse Manager  
Co-Owner-Manager

Supervisory

Shop Foreman  
Parts Foreman  
Warehouse-Assembly Foreman

Sales

Parts Salesman  
Salesman  
Truck Salesman  
Stock-Control Clerk  
Shipping and Receiving Clerk

Truck Mechanic  
Welder-Repairman  
Welder-Painter  
Bricklayer  
Carpenter  
Building Contractor  
Electrician

Semi-Skilled

Truck Driver  
Assemblyman  
Shop Worker  
Deliveryman  
Set-Up and Deliveryman  
Mechanic's Helper  
Pick-Up Man  
Customer Farm Machinery Operator

Unskilled

Common Laborer

Office

Clerk  
Bookkeeper  
Office Secretary  
Bookkeeper and Assistant Manager  
Office Helper  
Accountant

## Content Outline:

- I. Introduction to Agricultural Mechanics
  - A. Shop Orientation, management and safety
  - B. Selecting and using hand tools
  - C. Power tool use and safety
  - D. Repairing and sharpening hand tools
  - E. Making and reading working drawings
  - F. Fasteners
  - G. Painting and finishing
  - H. Glazing

- II. Agricultural Power and Machinery
  - A. Power and machine safety
  - B. Small gasoline engine, service and maintenance
  - C. Power units service and maintenance
  - D. Machinery and equipment
    - 1. Service
    - 2. Efficiency
    - 3. Selection/Purchasing
  - E. Mobile Hydraulics
- III. Agricultural Structures and Conveniences
  - A. Blue print reading
  - B. Structure design
    - 1. Livestock
    - 2. Machinery
    - 3. Agribusiness
  - C. Farm layouts
    - 1. Farmstead
    - 2. Livestock systems
    - 3. Grain and feed storage
    - 4. Material handling
  - D. Concrete
  - E. Environment
    - 1. Insulation
    - 2. Ventilation
    - 3. Waste disposal
  - F. Farm fences
- IV. Soil and Water Management
  - A. Land use management
    - 1. Land classification
    - 2. Terracing and waterways
    - 3. Transit levels

B. Water resources management

1. Irrigation systems
2. Domestic water systems
  - a. pumps
  - b. plumbing

V. Agricultural Construction and Maintenance

A. Welding

1. Arc welding and safety
2. Oxy-acetylene welding and safety
3. MIG and TIG welding and safety

B. Metals

1. Hot
2. Cold
3. Soldering

C. Carpentry and wood construction

1. Feeders
2. Trusses
3. Framing

VI. Agricultural Electricity

- A. Fundamentals of electricity and safety
- B. Electric wiring
- C. Electric motors and controls

Suggested Source Materials:

Carpentry and Wood Construction

1. HOW TO USE THE STANLEY TOOL SQUARE, Booklet, Division of Stanley Works.
2. SHARPENING HAND TOOLS, No. 3005, Illinois Vo-Ag Service.
3. SPRAY PAINTING, No. 3015, Illinois Vo-Ag Service.
4. STANLEY TOOL GUIDE HANDBOOK, Division of Stanley Works.
5. ROOFING FARM BUILDINGS, No. F2170, USDA.
6. RAFTER LAYOUT WITH THE FARMING SQUARE, Manual, No. 166, Hobar.
7. PAINTS AND PAINTING, No. AED-13, MWPS.
8. INSULATION AND HEAT LOSS, AED-13, MWPS.
9. INSULATION FOR FARM BUILDINGS, Pamphlet, Illinois Ag. Ed. Department.
10. THE FARM SHOP, Wakeman, MacMillan.

### Concrete and Concrete Masonry

1. QUALITY CONCRETE, Course of Study, Hobar Publishers.
2. CONCRETE TECHNOLOGY, Student Manual, Delmar Publishers.
3. DESIGN AND CONTROL OF CONCRETE MIXTURES, Manual, Portland Cement Association.
4. FARM MECHANICS, Phipps, Interstate Printers & Publishers.
5. AGRIBUSINESS MASONRY, (Specilaized Study 11th and 12th grades), Alabama Department of Education.

### Electricity - Wiring, Controls and Motors

1. FARM WIRING, PM518, ISU Extension Service.
2. FUNDAMENTALS OF MOTORS, Pamphlet, General Electric.
3. ELECTRICAL WIRING-FUNDAMENTALS AND PLANNING, Booklet, No. 3003a, Illinois Vo-Ag Service.
4. ELECTRICAL WIRING-PROCEDURES AND EXERCISES, Booklet, No. 3016, Illinois Vo-Ag Service.
5. HANDLING FARM MATERIALS, Bulleting No. 198, Maryland Extension Service.
6. AUTOMATIC FEEDING EQUIPMENT FOR LIVESTOCK AND POULTRY, Bulletin No. 2198, USDA.
7. WIRING SIMPLIFIED, Richter, Park Publishing Inc.
8. CONTROLS FOR AUTOMATION IN AGRICULTURE, Student Handbook, Penn. State Ag. Ed. Department.
9. CONTROLS FOR AUTOMATION IN AGRICULTURE, Student Laboratory Manual, Penn. State Ag. Ed. Department.

### Farmstead Planning, Service Center and Structures

1. PLANNING AND EQUIPPING A SERVICE CENTER FOR YOUR FARM, PM 525, ISU Extension Service.
2. BEEF HANDBOOK-HOUSING AND EQUIPMENT, No. 6, MWPS.
3. DAIRY HANDBOOK-HOUSING AND EQUIPMENT, No. 7, MWPS.
4. SWINE HANDBOOK-HOUSING AND EQUIPMENT, No. 8, MWPS.
5. DESIGNS FOR GLUED TRUSSES, No. 9, MWPS.
6. DESIGNS FOR SPLIT RING TRUSSES, No. 10, MWPS.
7. DESIGNS FOR NAILED TRUSSES, No. 11, MWPS.
8. PLANNING GRAIN-FEED HANDLING, No. 13, MWPS.
9. PRIVATE WATER SYSTEMS, No. 14, MWPS.
10. HORSE HANDBOOK-HOUSING AND EQUIPMENT, No. 15, MWPS.
11. HOW TO COMPLY WITH IOWA'S FEEDLOT RUNOFF CONTROL REGULATIONS, PM511, ISU Extension Service.
12. FEEDLOT PLANNING GUIDE FOR BEEF, DAIRY AND SWINE, Booklet, A. O. Smith.
13. FARM SILOS, M810, USDA.

### Farm Power and Machinery

1. MACHINES FOR POWER FARMING, Stone & Gulvin.
2. FARM TRACTORS, American Oil Company.
3. GULF FARM TRACTOR GUIDE, Gulf Oil Corporation.
4. BOOKLET ON LUBRICATION, Texaco Incorporated.

5. FACTS ABOUT STORAGE BATTERIES, E. S. B. Brands.
6. PARTS AND ASSEMBLY OF A LEAD ACID STORAGE BATTERY, E. S. B. Brands.
7. HOW A STORAGE BATTERY WORKS, E. S. B. Brands.
8. HOW TO READ, USE, AND CARE FOR MICROMETERS AND VERNIER GAGES, L. S. Starrett Company.
9. TRACTOR TIPS, Champion Spark Plug Company.
10. GENERAL THEORIES OF OPERATION, Briggs & Stratton.
11. REPAIR INSTRUCTIONS II, Briggs & Stratton.
12. REPAIR INSTRUCTIONS III, Briggs & Stratton.
13. REPAIR INSTRUCTIONS IV, Briggs & Stratton.
14. HYDRAULICS, International Harvester.
15. WHAT FUEL FOR YOUR TRACTOR, F.S. 1054, ISU Publications.
16. FACTORS INFLUENCING FARM FIELD COSTS, F.S. 1198, ISU Publications.
17. THREE POINT HITCH PLOW ADJUSTMENT, PM 219, ISU Publications.
18. FITTING MACHINERY & EQUIPMENT TO THE FARM, 2039, Illinois Vo-Ag Service.
19. FARM TRACTOR TUNE-UP, 3008, Illinois Vo-Ag Service.
20. VOCATIONAL INSTRUCTIONAL MATERIALS FOR AGRICULTURE, U. S. Government Printing Office.
21. OWNERS MANUAL, Implement Dealer or Company.
22. FUNDAMENTALS OF SERVICE, TIRES AND TRACKS, John Deere Service Publications.
23. FUNDAMENTALS OF SERVICE, SHOP TOOLS, John Deere Service Publications.
24. FUNDAMENTALS OF SERVICE, FUELS, LUBRICANTS & COOLANTS, John Deere Service Publications.
25. FUNDAMENTALS OF SERVICE, MOWING & SPRAYING EQUIPMENT, John Deere Service Publication.

### Safety

1. LIGHTNING AND LIGHTNING PROTECTION ON THE FARM, 3011, University of Illinois.
2. SAFETY IN THE AGRICULTURAL MECHANICS SHOP, 3022, University of Illinois.
3. POWER TOOL, SAFETY & OPERATION, 173, Hobar.

### Storage and Materials Handling

1. FARMSTEAD SEWAGE AND REFUSE DISPOSAL, 1963, AB274, USDA.
2. FARM POWER AND MACHINERY MANAGEMENT, Hunt, ISU Press.
3. FARM ANIMAL-WASTE MANAGEMENT, NCR 206, ISU Extension Service.
4. ON-THE-FARM FEED PROCESSING SYSTEMS, Circular R43, Auburn Extension Service.
5. FARM UTILITY BUILDINGS, AAVIM.
6. LIVESTOCK WASTE MANAGEMENT IN A QUALITY ENVIRONMENT, Circular 1074, Illinois Vo-Ag Service.
7. MATERIALS HANDLING-GRAINS & FEEDS, Booklet Agricultural Engineering Dept., University of Minnesota.

### Welding and Metals

1. LINCOLN ELECTRIC WELDING GUIDE, Booklet, Lincoln Electric Company.
2. WELDER'S GUIDE, 1963, Lincoln Electric Company.
3. OXYACETYLENE WELDING AND CUTTING, Booklet 3001a, Illinois Vo-Ag Service.
4. ARC WELDING, Booklet 3004, Illinois Vo-Ag Service.
5. USING THE CARBON-ARC TORCH, Booklet 3029, Illinois Vo-Ag Service.
6. TUNGSTEN INERT GAS (TIG) WELDING, Booklet 3036, Illinois Vo-Ag Service.
7. METALLIC INERT GAS (MIG) WELDING, Booklet 3037, Illinois Vo-Ag Service.
8. ARC WELDING, Booklet, Lincoln Electric Company.
9. PUMP FUNDAMENTALS, Gould Pumps Inc.
10. WELDING SKILLS AND PRACTICES, Giachino, American Technical Society.
11. Bulletin Catalog "Publications off the Press," Agricultural and Home Economics, Cooperative Extension Service, SDSU.

#### SOURCES OF REFERENCES AND INSTRUCTIONAL AIDS

1. AAVIM  
Engineering Center  
Athens, Georgia 30602
2. A. C. Spark Plug Division  
General Motors Corporation  
Flint, Michigan 48556
3. American Oil Company  
Advertising Department  
910 South Michigan Avenue  
Chicago, Illinois 60680
4. American Plywood Association  
1119 A Street  
Tacoma, Washington 98401
5. American Technical Society  
Chicago, Illinois 60611
6. A.O. Smith Harvestore Products, Inc.  
550 West Algonquin Road  
Arlington Heights, Illinois 60005
7. BOSCO  
217 East Missouri Avenue  
Kansas City, Missouri 64100



8. Briggs and Stratton  
Service Production Manager  
North 13th Street  
Milwaukee, Wisconsin 53211
9. Champion Spark Plug Company  
Toledo, Ohio 43600
10. DCA Educational Products, Inc.  
4865 Stenton Avenue  
Philadelphia, Pennsylvania 19144
11. Delco-Remy  
Division of General Motors  
Anderson, Indiana 46011
12. Delmar Publishers, Inc.  
Mountain View Avenue  
Albany, New York 12207
13. Department of Public Instruction  
Bureau of Career & Manpower Development  
Madison, Wisconsin 53702
14. Division of Occupational Education  
Agricultural Education Section  
Department of Public Instruction  
Raleigh, North Carolina 27600
15. Edison Electric Institute  
750 Third Avenue  
New York, New York 10017
16. ESB Brands Incorporated  
P.O. Box 6949  
Cleveland, Ohio 44100
17. Farm Department  
National Safety Council  
425 North Michigan Avenue  
Chicago, Illinois 60601
18. Farm Film Foundation  
1425 H. Street, N.W.  
Washington, D.C. 20000
19. Ford Motor Company  
Films Division  
Dearborn, Michigan 48120
20. Geigy Chemical  
P.O. Box 11422  
Greensboro, North Carolina 27409

21. Goodheart-Wilcox  
18250 Harwood  
Homewood, Illinois 60430
22. Gould Pumps, Inc.  
Seneca Falls, New York 13148
23. Gulf Oil Corporation  
Gulf Building  
Houston, Texas 77000
24. Hobar Publications  
1305 Tiller Lane  
St. Paul, Minnesota 55112
25. International Harvester  
Educational Service  
180 North Michigan Avenue  
Chicago, Illinois 60601
26. The Interstate Printers & Publishers  
Danville, Illinois 61832
27. Iowa Development Commission  
Des Moines, Iowa 50309
28. Iowa Farm Bureau  
5400 University Avenue  
West Des Moines, Iowa 50265
29. IAVIM Center  
Attention: Thomas A. Hoerner  
Agricultural Engineering Department  
Iowa State University  
Ames, Iowa 50010
30. Media Resource Center  
Iowa State University  
Pearson Hall  
Ames, Iowa 50010
31. Midwest Plan Service  
Iowa State University  
Agricultural Engineering Department  
Ames, Iowa 50010
32. Publications Distribution Center  
Iowa State University  
Printing & Publications  
Ames, Iowa 50010
33. ISU Press  
Iowa State University  
Ames, Iowa 50010

34. John Deere Film Library  
c/o Modern Talking Picture Service  
2323 New Hyde Park Road  
New Hyde Park, New York 11040
35. Keystone Steel & Wire Company  
Peoria, Illinois 61601
36. Kohler Company  
Kohler, Wisconsin 53044
37. Lincoln Electric Company  
22801 St. Clair Avenue  
Cleveland, Ohio 44117
38. L.S. Starrett Company  
Athol, Massachusetts 01331
39. MacMillan Company  
Cleveland 17, Ohio 44101
40. McGraw Hill Book Company, Inc.  
New York, New York 10001
41. North Dakota State University  
Extension Service  
Fargo, North Dakota 58100
42. Ohio Agricultural Education  
Curriculum Materials Service  
Room 201, 2120 Fyffe Road  
Columbus, Ohio 43210
43. Oklahoma Curriculum & Instructional Materials Center  
State Department of Vocational & Technical Education  
Stillwater, Oklahoma 74074
44. Park Publishing Incorporated  
P.O. Box 5527  
Minneapolis, Minnesota 55408
45. Pennsylvania State University  
Department of Agri. Education  
University Park, Pennsylvania 16802
46. Portland Cement Association  
33 West Grand Avenue  
Chicago, Illinois 60610
47. Potomac Edison Company  
55 East Washington Street  
Hagerstown, Maryland 21740

48. Prentice-Hall, Inc.  
Englewood Cliffs, New Jersey 07632
49. Purdue University  
Cooperative Extension Service  
Agricultural Engineering Department  
Lafayette, Indiana 47901
50. Successful Farming Teacher Service  
Meredith Publishers  
1716 Locust Street  
Des Moines, Iowa 50300
51. Superintendent of Documents  
U.S. Government Printing Office  
Washington, D.C. 20402
52. Smith Welding Equipment  
Division of Tescom Corp.  
2600 Niagara Lane North  
Minneapolis, Minnesota 55400
53. Stanley Tools  
New Britain, Connecticut 06050
54. State Department of Education  
Vocational & Technical Division  
Athens, Georgia 30601
55. State Department of Education  
Vocational Division  
Agribusiness Education Service  
Montgomery, Alabama 36104
56. State Education Department  
Bureau of Secondary Curriculum Development  
Albany, New York 12224
57. Stone & Gulvin  
John Wiley & Sons  
New York, New York 10001
58. Technical Publications, Inc.  
1014 Wyandette Street  
Kansas City, Missouri 64100
59. Texaco, Incorporated  
135 East 42nd Street  
New York, New York 10017
60. Texas A & M University  
Teaching Materials Center  
College Station, Texas 77843

61. University of Alabama  
Extension Service  
Auburn, Alabama 36830
62. University of Illinois  
Vocational Agriculture Service  
College of Agriculture  
434 Mumford Hall  
Urbana, Illinois 61801
63. University of Minnesota  
Agricultural Engineering  
Minneapolis, Minnesota 55401
64. University of Missouri  
Instructional Materials Laboratory  
Columbia, Missouri 65201
65. Victor Company  
Denton, Texas 76201
66. Vocational Education Productions  
California Poly State University  
San Luis Obispo, California 93401
67. Wisconsin Dept. of Public Instruction  
Madison, Wisconsin 53703
68. Bulletin Room  
Extension Building  
South Dakota State University  
Brookings, South Dakota 57006

#### 4. Agricultural Products (01.04)

##### Example Performance Objectives:

1. Given the wholesale beef meat cuts, the student will be able to identify and indicate location of retail meat cuts with 90% accuracy within the period of one minute.
2. Given a sample of wheat and analysis information for the sample the student will be able to place the proper U.S.D.A. commodity grade on the sample with 100% accuracy.
3. Given a dozen eggs the student will be able to candle and place the correct U.S.D.A. commodity grade on the eggs with ten eggs graded correctly.

## Occupational Titles

Instructional programs based upon content in this guide will prepare individuals for job entry, will upgrade occupational skills, or will prepare learner for further occupational preparation.

Meat And Meat By-Products

Brand Inspector  
Butcher, All-Round  
Commission Man  
Department Manager  
Livestock Buyer  
Livestock Inspector  
Locker Plant Operator  
Maintenance Man  
Market Research Analyst  
Meat Grader  
Meat Processing Plant Manager  
Meat Inspector  
Processing Operation Employee  
Quality Control Officer  
Salesman  
Scale Operator  
Smoker  
Supervisor  
Traffic Management Officer  
Trucker  
Warehouseman  
Yard Man

Vegetable and Fruit Processing

Department Manager  
Inspector  
Maintenance Man  
Market Research Analyst  
Plant Manager  
Processing Operations Employee  
Produce Buyer  
Produce Grader  
Quality Control Officer  
Receiver  
Salesman  
Sampler  
Scale Operator  
Supervisor  
Traffic Management Officer  
Trucker  
Warehouseman

Grain And By-Products

Commission Man

Wool And Other Fiber Products

Commission Man  
Department Manager  
Maintenance Man  
Market Research Analyst  
Mill Manager  
Processing Operation Employee  
Salesman  
Scale Operator  
Supervisor  
Traffic Management Officer  
Trucker  
Quality Control Officer  
Warehouseman  
Wool Blender  
Wool Buyer  
Wool Grader  
Wool Inspector  
Wool Sorter

Dairy Processing

Dairy Products Buyer  
Dairy Tester  
Department Manager  
Field Contact Man  
Inspector  
Maintenance Man  
Market Research Analyst  
Milk Receiver  
Milk Sampler  
Plant Manager  
Processing Operations Employee  
Product Grader  
Quality Control Officer  
Salesman  
Scale Operator  
Supervisor  
Traffic Management Officer  
Trucker  
Warehouseman

Egg Processing

Commission Man  
Department Processing Manager  
Egg Candler

Fieldman	Egg Grader
Grain Buyer	Egg Inspector
Grain Grader	Maintenance Man
Grain Processing Employee	Market Research Analyst
Grain Mixer	Plant Processing Manager
Grain Elevator Employee	Poultry And Egg Buyer
Inspector	Processing Operations Employee
Maintenance Man	Quality Control Officer
Manager Grain Elevator	Salesman
Market Research Analyst	Scale Operator
Mill Operator	Supervisor
Quality Control Officer	Traffic Management Officer
Salesman	Trucker
Scale Operator	Warehouseman
Seed Analyst	
Supervisor	
Traffic Management Officer	
Trucker	
Warehouseman	

#### Content Outline:

#### I. Plant Products

##### A. Grain and grain products

1. Purchasing of grain
2. Grain conditioning and storage
3. Warehousing of grain
4. Transportation of grain
5. Processing grain into human and animal foods
6. Marketing processed foods
7. Government regulations

##### B. Vegetable/Fruit processing, distribution and marketing

1. Purchasing of raw product
2. Assembly and receiving the raw product
3. Maintaining sanitary equipment and facilities
4. Processing of raw products
5. Storage and warehousing
6. Transportation
7. Marketing
8. Government regulations

##### C. Misc. Crops

1. Commercial Seed Processing
2. Alfalfa pelleting
3. Edible beans
4. Sunflowers
5. Flax straw
6. Sugar beets
7. Potatoes
8. Popcorn

## II. Animal Products

### A. Meat processing and meat by-products

1. Livestock purchase
2. Assembly of livestock
3. Transportation to processing plants
4. Slaughter - Commercial/Home
5. Maintaining sanitary facilities and equipment
6. Breaking and fabrication
7. Storage
8. Packaging
9. By-products
10. Marketing of all products
11. Transportation from wholesale to retail
12. Government regulations

### B. Dairy

1. Collect milk from producers
2. Receive, clarify and filter milk
3. Determine milk quality
4. Processing milk
5. By-products and special products
6. Maintaining sanitary equipment
7. Marketing
8. Government regulations

### C. Eggs

1. Assembly
2. Sanitizing
3. Grading and pricing
4. Packaging
5. Storage
6. Transportation
7. Marketing
8. Processing
9. Government regulations

### D. Miscellaneous animal products

1. Honey
2. Wool
3. Manure processing

## Suggested Source Materials

### Bulletins:

Bulletin Catalog "Publications off the Press," Agriculture and Home Economics, Cooperative Extension Service, SDSU.



Books:

1. FOOD SCIENCE, Potter, AVI Publishing.
2. FUNDAMENTALS OF FOOD PROCESSING OPERATIONS, Heid and Joslyn, AVI Publishing.
3. TECHNOLOGY OF FOOD PRESERVATION, Derosier, AVI Publishing.
4. INTRODUCTION TO FEED SCIENCE AND TECHNOLOGY, Stewart and Amerine Academic Press.

## SOURCES OF REFERENCES AND INSTRUCTIONAL AIDS

1. Agricultural Institute  
Patterson Hall  
North Carolina State University  
Raleigh, North Carolina 27607
2. American Can Company  
7230 Park Avenue  
New York, New York 10017
3. AVI Publishing Company, Inc.  
P.O. Box 831  
Westport, Connecticut 06880
4. Academic Press, Inc.  
111 Fifth Avenue  
New York, New York 10003
5. American Sheep Producers Council  
200 Clayton Street  
Denver, Colorado 80206
6. American Meat Institute  
59 East Van Buren Street  
Chicago, Illinois 60605
7. American Wool Council  
200 Clayton Street  
Denver, Colorado 80206
8. Mr. Belmer Ekis, Office Supervisor  
USDA Consumer & Marketing Service  
Room 606  
1912 Grand Avenue  
Des Moines, Iowa 50309
9. The Canning Trade  
2619 Maryland Avenue  
Baltimore, Maryland 21218
10. Chemical Publishing Company  
New York, New York 10000

11. J. G. Ferguson Publishing Company  
6 North Michigan Avenue  
Chicago, Illinois 60602
12. Grain and Feed Dealers National Ass'n.  
500 Folger Building  
725 15th Street, N.W.  
Washington, D.C. 20005
13. Industrywide Lamb & Wool Planning Comm.  
600 Crandall Building  
Salt Lake City, Utah 84101
14. Interstate Printers and Publishers  
Danville, Illinois 61832
15. Institute of Food Technologists  
176 Adams Street  
Chicago, Illinois 60603
16. Iowa State Commerce Commission  
Warehouse Division  
Des Moines, Iowa 50309
17. Iowa State University  
  
Dept. of Dairy & Food Industry  
Dairy Industry Building  
  
Media Resources Center  
Pearson Hall  
  
ISU Press  
Press Building  
  
Ames, Iowa 50010
18. John Wiley and Sons  
605 Third Avenue  
New York, New York 10016
19. Lea and Febiger  
600 Washington Square  
Philadelphia, Pennsylvania 19106
20. J. B. Lippincott Company  
E. Washington Square  
Philadelphia, Pennsylvania 19105
21. Michigan State University  
Extension Service  
East Lansing, Michigan 48823

22. Milk Industry Foundation  
910 17th Street, N.W.  
Washington, D.C. 20006
23. Modern Talking Pictures Service  
Cedar Rapids, Iowa 52406
24. Moraine Park Technical Institute  
Beaver Dam, Wisconsin 53916
25. Moraine Park Technical Institute  
Fon du Lac, Wisconsin 54935
26. Movies, USA, Incorporated  
729 Seventh Avenue  
New York, New York 10000
27. NASCO  
Fort Atkinson, Wisconsin 53538
28. National Livestock & Meat Board  
26 South Wabash Avenue  
Chicago, Illinois 60604
29. North Central Wool Marketing Corp.  
101 27th Avenue, S.E.  
Minneapolis, Minnesota 55414
30. Ohio State University  
Agricultural Extension Service  
Columbus, Ohio 43210
31. Prentice Hall, Inc.  
Englewood Cliffs, New Jersey 07632
32. Superintendent of Documents  
Government Printing Office  
Washington, D.C. 20402
33. Teaching Materials Center  
Texas A & M University  
College Station, Texas 77843
34. University of Illinois  
  
Vo-Ag Service  
  
Cooperative Extension Service  
  
Urbana, Illinois 61801
35. University of Michigan  
Audio Visual Education Center  
Ann Arbor, Michigan 48103

36. University of Missouri  
Cooperative Extension Service  
Columbis, Missouri 62501
  37. University of Wisconsin  
  
Bureau of Audio-Visual Instruction  
  
Bulletin Mailing Room, College of Agriculture  
  
Madison, Wisconsin 53702
  38. United States Department of Agriculture  
  
Consumers Mktg. Service, Poultry Division  
  
Statistical Reporting Service  
  
Marketing Service  
  
Washington, D.C. 20250
  39. Vocational Education Productions  
California Polytech, State University  
San Luis Obispo, California 93401
  40. Western Poultry Congress  
P.O. Box 307  
Baldwin Park, California 91706
  41. Wisconsin Department of Public Instruction  
Madison, Wisconsin 53700
  42. Wisconsin State Employment Service  
Madison, Wisconsin 53700
  43. Bulletin Room  
Extension Building  
South Dakota State University  
Brookings, South Dakota 57006
5. Ornamental Horticulture (Production, Processing, Marketing, and Services) (01.05)

Example Performance Objectives:

1. Given an injured tree and the proper tools and materials, the student will properly remove or repair the injury to the satisfaction of the instructor.
2. Given a soil sample and a soil testing kit, the student will test the sample for pH, N, P, and K in a period of 90 minutes and be 90% accurate.

3. Given ten plant insects, the student will correctly identify the insects and make one recommendation for control of each insect in a period of 30 minutes and be 90% accurate.

### Occupational Titles

Instructional programs based upon content in this guide will prepare individuals for job entry, will upgrade occupational skills, or will prepare the learner for further occupational preparation.

#### Production Oriented Occupations

Greenhouse Worker  
Nursery Worker  
Nursery Owner  
Vegetable Producer  
Christmas Tree Producer  
Turf Producer  
Tree Farmer  
Greenhouse Owner  
Flower Production Employer  
Bedder  
Vegetable Grower Employee  
Fruit Producer  
Mushroom Grower  
Nursery Employee  
Wholesale Flower Producer

#### Technical Oriented Occupations

Greenskeeper  
Agronomist  
Equipment Mechanic  
Plant Propagator  
Lawn Specialist  
Tree Surgeon  
Tree Sprayer  
Tree Pruner  
Landscape Architect  
Arborist  
Pest Control Technician  
Inspector  
Research  
Extension Specialist  
Landscape Designer  
Landscape Consultant  
Plant Breeder  
Lab Technician

#### Sales and Service Occupations

Flower Shop Worker  
Florist  
Garden Center Manager  
Horticultural Products Sales Person  
Vegetable Market Manager  
Fruit Market Manager  
Fruit Market Employee  
Floral Arrangement Specialist  
Produce Dept. Manager - Grocery Store  
Deliveryman  
Garden Center Employee

#### Related Occupations

Landscaping Assistant  
Landscape Gardener  
Athletic Field Groundskeeper  
Teaching (Vo-Ag Instructor)  
Industrial Grounds Maintenance Person  
Golf Course Employee  
City, State and National Park Employee  
State Gardener  
Highway Maintenance Person  
Park Superintendent  
Groundskeeper  
Director of Seed Company  
Editor-Horticultural Publications  
Landscape Construction  
Office Worker  
Physical Plant Manager  
Chemical Company Representative  
Horticultural Equipment Sales  
Landscape Contractor  
Horticultural Products Broker

## Content Outline

## I. General

- A. Plant classification
- B. Plant propagation
- C. Growth and development of plants
- D. Soil and growth media
- E. Plant pests and diseases
- F. Construction, maintenance and utilization of growing structures
- G. Hand tools, power tools, and hardware; safety
- H. Operation and maintenance of small gas engines, and power units; safety
- I. Operation and maintenance of horticulture equipment; safety

## II. Specialized Areas

## A. Arboriculture 01.0501

- 1. Identification and selection of trees and shrubs
- 2. Planting trees and shrubs
- 3. Selection and application of fertilizers and pesticides
- 4. Pruning
- 5. Maintenance procedures

## B. Floriculture 01.0502

- 1. Planting media preparation
- 2. Greenhouse plant propagation
- 3. Fertilization and pest control
- 4. Maintaining desirable environmental conditions
- 5. Uses and characteristics of flowers, plants, and other decorative materials
- 6. Flower arrangements and design
- 7. Greenhouse management

## C. Nursery 01.0505

- 1. Identification and selection of nursery stock
- 2. Planting media preparation
- 3. Planting and transplanting nursery stock
- 4. Sexual propagation
- 5. Propagation by cutting, grafting, budding
- 6. Fertilizers and fertilization
- 7. Pruning nursery stock

8. Weed control
9. Disease, insect, and pest control
10. Chemical safety
11. Nursery management

D. Landscaping 01.0504

1. Site selection and preparation
2. Selecting and planting landscape stock
3. Watering weed control
4. Fertilizers and fertilization
5. Insect and disease control
6. Pruning
7. Landscape business management

E. Turfgrass maintenance and management 01.0506

1. Selecting turfgrass for new seedings
2. Turf site preparation
3. Turf establishment by seeding and vegetable planting
4. Mowing turf areas
5. Watering turf
6. Turf weed control
7. Disease, insect and pest control
8. Chemical safety
9. Renovation of old turf areas

Suggested Source Materials

1. ALL ABOUT VEGETABLES, Chevron Chemical Company.
2. ANNUALS FOR CUT FLOWERS, Potter Florist Publishing Company.
3. APPROVED PRACTICES IN FRUIT PRODUCTION, Scheer-Jurgenson; Interstate Printers & Publishers.
4. ARRANGING FLOWERS IN VASES AND BOWLS, University of Illinois.
5. HOME GARDENING, Meredith Corporation.
6. BUYING BEDDING PLANTS, University of Illinois.
7. SMALL ENGINE SERVICE MANUAL, Briggs and Stratton Corp.
8. A CHILD'S GARDEN, Chevron Chemical Company.
9. COURSE OUTLINE FOR HORTICULTURE, 12 Modules; Ohio State University.
10. EXPLORING EDUCATIONAL OPPORTUNITIES, University of Illinois.
11. 50 LABORATORY EXERCISES FOR VOC. HORT, Hemp; Interstate Printers & Publishers.
12. FLOWERS AND GREENHOUSES (Bulletin Packet) University of Illinois.
13. FLORIST DECORATIONS FOR THE TABLE, Stevenson; Florist Publishing Company.
14. FLOWER AND PLANT PRODUCTION IN THE GREENHOUSE, Nelson; Interstate Printers & Publishers.
15. FRUIT GROWING, Schneider & Scarborough; Prentice Hall.
16. FUNDAMENTALS OF HORTICULTURE, Edmondson-Andrews; McGraw Hill.
17. GOLF TURF MANAGEMENT, Musser; McGraw Hill.
18. HANDBOOK FOR VEGETABLE GROWERS, Knott; Wiley Company.

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19. HORTICULTURAL SCIENCE, Janik; W. H. Freeman and Company.
20. HOW TO USE A CHAIN SAW, McCulloch Motor Company.
21. LANDSCAPING, Department of Public Instruction; Indianapolis, Indiana.
22. LANDSCAPING DO'S AND DON'TS, Interstate Printers & Publishers.
23. LANDSCAPE TREES AND SHRUBS, Galloway Gardens.
24. THE LAWN BOOK, Macmillan.
25. LAWNS AND GROUND COVER, Sunset Editorial Staff; Lane Book Company.
26. MANAGEMENT PLANS FOR GREENHOUSES, George Ball Company.
27. MODERN FRUIT SCIENCE, Childers; Horticultural Publications.
28. OPERATING A GARDEN CENTER, Pinney; Florist Publishing Company.
29. ORNAMENTAL HORTICULTURE INSTRUCTIONAL MATERIAL, Pennsylvania State University.
30. ORNAMENTAL HORTICULTURE; A GUIDE FOR ORGANIZING OCCUPATIONAL PROGRAMS, University of the State of New York.
31. ORNAMENTAL HORTICULTURE, Utah State University.
32. ORNAMENTAL HORTICULTURE, Greenhouse Management; Wisconsin State.
33. ORNAMENTAL HORTICULTURE, Montgomery, Alabama.
34. ORNAMENTAL HORTICULTURE, State Department of Education; Richmond, Virginia.
35. OPERATING A RETAIL FLOWER SHOP, University of Illinois.
36. OUTLOOK FOR FRUIT, USDA.
37. OUTLOOK FOR VEGETABLES, USDA.
38. PLANT PROPAGATION, PRINCIPLES AND PRACTICES, Hartman-Kester, Prentice Hall.
39. PRINCIPLES OF HORTICULTURE, Denison; Macmillan Company.
40. PRODUCING POINSETTIAS COMMERCIALY, University of Illinois.
41. PRODUCING VEGETABLE CROPS, Ware and McCollum; Interstate Printers & Publishers.
42. RETAIL FLORIST, Liosvold; Florist Publishing Company.
43. RETAIL FLOWER SHOP OPERATION AND MANAGEMENT, Penn State University.
44. SHRUB IDENTIFICATION BOOK, Symonds; Barrows & Company.
45. SHRUBS FOR LANDSCAPING, IDENTIFICATION, CULTURE, USE, Ohio State University.
46. SIMPLIFIED FLOWER ARRANGING, Robert; Florist Publishing Company.
47. SMALL ENGINES, PRINCIPLES OF OPERATION, College of Agriculture; Urbana, Illinois.
48. SOILS, Yearbook of Agriculture; USDA.
49. STUDENT GUIDE FOR FLORIST HELPER, University of Kentucky.
50. TEACHERS GUIDE FOR ORNAMENTAL HORTICULTURE, University of Georgia.
51. THE NURSERY WORKER PART I & II, Ohio State University.
52. TRANSPLANTING SHADE TREES, University of Illinois.
53. TREE IDENTIFICATION BOOK, Symonds; Barrows & Company.
54. TREES FOR LANDSCAPING, Ohio State University.
55. TURF GRASS PEST CONTROL, University of Illinois.
56. TURF GRASS DISEASES AND THEIR CONTROL, University of Illinois.
57. TWO-YEAR PROGRAM IN VOCATIONAL HORTICULTURE 1 & 2, Department of Vocational Education; St. Paul, Minnesota.
58. TURF MANAGEMENT HANDBOOK, Sprague; Interstate Publishers.



59. WEDDING FLOWER DECORATIONS, Clark; Florist Publishing Company.
60. Bulletin Catalog "Publications off the Press," Agriculture and Home Economics, Cooperative Extension Service, SDSU.

## SOURCES OF REFERENCES AND INSTRUCTIONAL AIDS

1. State Department of Education  
Vocational Division  
Agri-Business Education Service  
Montgomery, Alabama 36104
2. University of Arizona  
Department of Agricultural Education  
Tucson, Arizona 85702
3. McCulloch Motors Company  
Los Angeles, California 90052
4. California Chemical Company  
Ortho Division  
200 Bush Street  
San Francisco, California 94101
5. Vocational Education Publications  
California State Poly Tech College  
San Luis Obispo, California 93401
6. W. H. Freeman Company  
San Francisco, California 94101
7. Superintendent of Documents  
Washington, D.C. 20402
8. Gallaway Gardens  
Educational Department  
Box 537  
Pine Mountain, Georgia 31822
9. Garrard Publishing Company  
Champaign, Illinois 61820
10. Iowa State University  
Ames, Iowa 50010
11. Iowa State University Press  
Ames, Iowa 50010
12. Florist Publishing Company  
343 Dearborn  
Chicago, Illinois 60604
13. American Nurserymen  
343 Dearborn  
Chicago, Illinois 60604

14. George T. Ball, Inc.  
West Chicago, Illinois 60185
15. University of Illinois  
Vocational Agricultural Service  
534 Mumford Hall  
Urbana, Illinois 61804
16. Interstate Printers and Publishers  
Danville, Illinois 61832
17. Indiana State University  
Vocational Instructional Materials  
Division of Industrial Education  
Terre Haute, Indiana 67809
18. University of Kentucky  
Department of Agricultural Education  
Lexington, Kentucky 40507
19. Michigan State University  
East Lansing, Michigan 48823
20. Department of Vocational Education  
Capital Square Building  
St. Paul, Minnesota 55101
21. 3 M Company  
Visual Products Division  
2501 Hudson Road  
St. Paul, Minnesota 55101
22. Technical Publications  
934 Wyandotte Street  
Kansas City, Missouri 64105
23. Bureau of Audio Visual Instruction  
Extension Division  
University of Nebraska  
Lincoln, Nebraska 68503
24. D Van Nostrand Company, Inc.  
120 Alexander Street  
Princeton, New Jersey 07632
25. Prentice Hall, Inc.  
Englewood Cliffs, New Jersey 07632
26. Cornell University  
Ithaca, New York 14850
27. Macmillan Company  
866 Third Avenue  
New York, New York 10022

28. McGraw-Hill Book Company  
1221 Avenue of the Americas  
New York, New York 10020
29. New York State University  
State Education Department  
Bureau of Secondary Curriculum Dev.  
Albany, New York 12224
30. Vocational Guidance Manuals, Inc.  
800 Second Avenue  
New York, New York 10017
31. Meredith Publishing Company  
Des Moines, Iowa 50336
32. Jackson Perkins Company  
Newark, New York 14513
33. John Wiley & Sons, Inc.  
605 Third Avenue  
New York, New York 10016
34. Barrows and Company  
425 Fourth Avenue  
New York, New York 10016
35. Rotary Graphic Press  
New York, New York 10001
36. Giegv Agricultural Chemicals  
P.O. Box 11422  
Greensboro, North Carolina 27409
37. Modern Talking Pictures Service  
3 East 54th Street  
New York, New York 10001
38. Division of Vocational Education  
Department of Public Instruction  
Agricultural Education Section  
Raleigh, North Carolina 27602
39. North Dakota Voc-Ag. Association  
100 Morrill Hall  
North Dakota State University  
Fargo, North Dakota 58102
40. Ohio Agricultural Education  
Curriculum Materials Service  
2120 Fyffe Road  
Columbus, Ohio 43210

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41. Ohio State University  
The Center for Vocational and Technical Education  
1900 Kenny Road  
Columbus, Ohio 43210
  42. Pennsylvania State University  
College of Agriculture Experiment  
Station  
Department of Agriculture Education  
University Park, Pennsylvania 16802
  43. Agricultural Education  
Teaching Materials Center  
Texas A & M University  
College Station, Texas 77843
  44. Utah State University  
Department of Agricultural Education  
Logan, Utah 84321
  45. State Department of Education  
Agriculture Education Service  
Richmond, Virginia 23216
  46. NASCO  
Fort Atkinson, Wisconsin 53538
  47. Briggs and Stratton Corp.  
Milwaukee, Wisconsin 53202
  48. Bulletin Room  
Extension Building  
South Dakota State University  
Brookings, South Dakota 57006
6. Agricultural Resources ( Conservation, Utilization and Services)  
(01.06)

Example of performance objective:

1. The student should be able to, given a specific career in which the student is interested, determine the competencies and requirements needed by persons to enter and advance in that career in accordance with the Dictionary of Occupational Titles.
2. The student should be able to, upon determining the requirements and competencies needed to enter a job, develop a personal plan which will aid him in acquiring the competencies and meeting the requirements needed for entry in that job to the satisfaction of the instructor.

3. The student should be able to, in seeking information about job opportunities, survey or obtain literature information which will assist him in determining the number and kind of job opportunities that are available in Agricultural resources.

#### Occupational Titles:

Instructional programs based upon content in this guide will prepare individuals for job entry, will upgrade occupational skills, or will prepare learners for further occupational preparation.

#### Air Resource Management

Air Pollution Control Worker  
Air Monitoring Technician  
Smoke Tester  
Air Analyst  
Compliance Section Technician  
Engineering Section Technician  
Air Pollution Control Supervisor  
Air Pollution Control Meteorologist  
Air Pollution Control Chemist  
Air Pollution Control Engineer

#### Fish Management

Fish Hatchery Worker  
Fish Farmer  
Conservation Patrolman  
Fish Culturist  
Fisheries Scientist  
Fish Hatchery Superintendent  
Fisheries Technician  
Fishery Biologist  
Fishery Manager

#### Forest Resource Management

Tree Planter  
Forestry Aide  
Tree Farmer  
Forest Technician  
Wood Supervisor  
Forest Nursery Technician  
Forest Cruiser  
Forest Warden  
Forester  
Forest Entomologist  
Consulting Forester  
Forest Examiner  
Forest Supervisor

#### Land Use Planning

Surveyor's Assistant-Rodman  
Surveyor's Assistant-Chainman  
Surveyor  
City Planning Aide  
Urban Planning Technician  
Zoning Inspector  
Zoning Technician  
Chief Planning Officer  
City Planning Engineer  
Urban Planner  
Regional Planner  
Land Use Planner  
Architectural Engineer  
Mining Area Restoration Worker  
Mining Area Restoration Technician  
Open Pit Mine Conservation Inspector  
Mineralogist  
Geologist

#### Outdoor Recreation Planning

Grounds Keeper  
Parks Caretaker  
Parks Worker  
Recreation Farm Manager  
Dude Ranch Manager  
Hunting and Fishing Guide  
Recreational Development Technician  
Fish and Game Club Manager  
Ski Patrolman  
Winter Sports Manager  
Guest Farm Manager  
Parks Foreman  
Parks Naturalist  
Parks Superintendent  
Parks Ranger  
Campground Caretaker  
Camp Counselor

Forest Engineer  
 Forest Ecologist  
 Forest Ranger  
 Silviculturalist  
 Saw Mill Manager  
 Saw Mill Foreman  
 Saw Mill Worker  
 Forest Manager

Water Resource Management

Watershed Manager  
 Water Filter Cleaner  
 Wastewater Disposal Worker  
 Basin Operator  
 Watershed Tender  
 Public Health Engineering Aide  
 Sanitarian Aide  
 Stream Sanitation Technician  
 Sanitarian  
 Limnologist  
 Water and Waste Treatment Plant  
 Manager  
 Water Quality Chemist  
 Public Health Bacteriologist  
 Industrial Wastes Inspector  
 Hydrologist  
 Water Resources Investigator  
 Water Well Inspector  
 Water Treatment Plant Technician  
 Wastewater Treatment Plant Technician  
 Water Economist

Content Outline:

I. Forests

- A. Importance of forests
- B. Timber stand improvement
- C. Forest disease, insect and pest control
- D. Fire prevention and control
- E. Forest management services

II. Recreation

- A. Demand for recreation
- B. Kinds of outdoor recreational enterprises

Soil Conservation

Soil Conservation Aids  
 Soil Conservation Technician  
 Engineering Technician  
 Soil Scientist  
 Soil Fertility Expert  
 Soil Bacteriologist  
 Agrogeologist (Soil Mapper or Surveyor)  
 Soil Conservationist  
 Drainage Design Coordinator  
 ASCS Supervisor  
 ASCS Manager

Wildlife Management

Game Farm Worker  
 Gamekeeper  
 Wildlife Conservation Officer  
 Animal Shelter Keeper  
 Wildlife Technician  
 Game Warden  
 Animal Shelter Manager  
 Game Propagator  
 Wildlife Biologist  
 Wildlife Specialist  
 Wildlife Administrator  
 Waterfowl Specialist

- C. Sources of supplemental income
- D. Exploring opportunities for establishing a recreational enterprise
- E. Develop a safety program for a recreational facility
- F. Laws regulating recreational enterprises
- G. Financing recreation
- H. Advertising and promoting
- I. Personnel management

### III. Soil

- A. Becoming familiar with soil and soil formation
- B. Determine properties of soil
- C. Erosion
- D. Land use classification
- E. Land use recommendation
- F. Practices for controlling erosion and sedimentation
- G. Soil survey and land layout
- H. Soil management advisory services available
- I. Hazards in special uses
- J. Zoning

### IV. Wildlife

- A. Identifying important wildlife species
- B. Managing wildlife populations
- C. Establishing and managing wildlife preserves
- D. State and federal agencies in wildlife conservation
- E. Game bird management and propagation
- F. Fish management and propagation
- G. Surveying wildlife and wildlife cover

## V. Water

- A. Sources
- B. Demands for water
- C. Water storage
- D. Effects of storage on water
- E. Watershed protection
- F. Evaluating water quality
- G. Water treatment
- H. Waste water management
- I. Weather modification

## VI. Air

- A. Natural processes in the atmosphere
- B. Pollution in the atmosphere
- C. Expressing concentration of pollutants
- D. Effects of air pollution
- E. Maintaining air quality
- F. Air pollution sampling and monitoring
- G. Controlling noise
- H. Controlling odor
- I. Weather interpretation

## VII. Range

- A. Range plant ecology
- B. Range plant identification
- C. Range condition, trend and utilization
- D. Range grazing management
- E. Range renovation practices
- F. Management services available



- VIII. Mining area restoration (coal, gravel, minerals, quarries and roads)
- A. Characteristics and physical condition of disturbed land
  - B. Adapting reclamation to site
  - C. Steps in basic reclamation
  - D. Law and surface mining
  - E. Conservation effort
- IX. Forestry (Production, processing, management, marketing and services)
- A. Tree identification
  - B. Establishing the forest
  - C. Forest mensuration
  - D. Planning groves and windbreaks
  - E. Christmas tree production
  - F. Logging
  - G. Wood utilization
  - H. Forest Management Services

Suggested Source Materials:

Bulletins:

1. CAREERS IN WATER POLLUTION CONTROL; Water Pollution Control Federation.
2. SUGGESTIONS & PROCEDURES FOR DEVELOPING TEACHING-LEARNING STATIONS; North Carolina Department of Public Instruction.
3. OUTDOOR RECREATION IN IOWA TO 1980; Pm461, I.S.U. Publications.
4. OUTDOOR RECREATION RESOURCES; I.S.U. Publications.
5. SUGGESTIONS & PROCEDURES IN DEVELOPING NATURE TRAILS; North Carolina Department of Public Instruction.
6. THE IOWA CONSERVATIONIST-Magazine; Iowa Conservation Commission.
7. IOWA SOIL CONSERVATIONIST-Magazine; Soil Conservation Service.
8. RURAL ENVIRONMENTAL ASSISTANCE PROGRAM; A.S.C.S.
9. AGRICULTURE U.S.A.; U.S.D.A. Office of Information.
10. RESOURCE CONSERVATION IN IOWA; S.C.S.
11. E.Q. INDEX; National Wildlife Federation.
12. CAREERS IN WILDLIFE CONSERVATION; C6. Cornell University.
13. CONSERVATION ACTION HANDBOOK; C7. Cornell University.
14. AN OUTLINE FOR TEACHING CONSERVATION IN HIGH SCHOOL; PA201. U.S.D.A. Office of Information. 1970.

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15. TEACHING CONSERVATION THROUGH OUTDOOR EDUCATION AREAS; PA837. U.S.D.A. Office of Information. 1970.
16. TEACHING SOIL AND WATER CONSERVATION: A CLASSROOM & FIELD GUIDE; PA341, U.S.D.A. Office of Information. 1970.
17. OUTDOOR CLASSROOM ON SCHOOL SITES; PA975. U.S.D.A. Office of Information. 1972.
18. ENVIRONMENTAL HEALTH AND POLLUTION CONTROL; PM486. I.S.U. Publications.
19. PLANNING A CAREER IN FISH & WILDLIFE MANAGEMENT; State Conservation Commission.
20. AGRICULTURAL RESEARCH: IMPACT ON ENVIRONMENT; SR69. I.S.U. Publications.
21. FARM MANUAL: ENVIRONMENT; Standard Oil Division.
22. A WILDLIFE CONSERVATION CAREER FOR YOU; Wildlife Society.
23. AGRICULTURE, CAREERS THAT IMPROVE THE QUALITY OF LIFE, RESTORE THE ENVIRONMENT, FEED THE WORLD; Maryland Department of Education.
24. CONSERVATION OF NATURAL RESOURCES: PESTICIDES; Cornell University.
25. CAREERS IN WILDLIFE CONSERVATION; Olin Mathieson Chemical Corporation.
26. Bulletin Catalog "Publications off the Press," Agricultural and Home Economics, Cooperative Extension Service, SDSU.

#### Air Resource Management

1. AIR POLLUTION INJURY TO VEGETATION; AP71. National Air Pollution Control Administration.
2. IOWA WEEKLY WEATHER & CROP REPORT; Statistical Reporting Service.
3. AIR POLLUTION: THE FACTS; National Tuberculosis & Respiratory Disease Association.
4. LIGHTNING OVER IOWA; I.S.U. Publications.
5. OUR "USUAL" WEATHER; I.S.U. Publications.
6. HOW WEATHER FORECASTS ARE MADE; I.S.U. Publications.
7. CLOUDS: THE SIGNPOSTS OF THE SKY; I.S.U. Publication.
8. THE AIR WE LIVE IN; I.S.U. Publications.
9. WHAT IS WEATHER?; I.S.U. Publications.
10. WHY OUR WEATHER CHANGES; I.S.U. Publications.
11. FARM MANUAL: WEATHER; Standard Oil Division.
12. WEATHER MANAGEMENT; Successful Farming.
13. SMOG & WEATHER; National Coal Association.
14. NOISE POLLUTION CONTROL IN ILLINOIS; Illinois Environmental Protection Agency.

#### Fish Management

1. POND FISH & FISHING IN ILLINOIS; Lipinat. University of Illinois.
2. IOWA ORNITHOLOGIST UNION FIELD CHECK LIST; Iowa Ornithologist Union.
3. WILDLIFE OF LAKES, STREAMS & MARSHES; National Wildlife Federation.
4. WARM WATER PONDS FOR FISHING; No. 2210. U.S.D.A. Office of Information.
5. MANAGING FARM FISHPONDS FOR BASS & BLUEGILLS; No. 2094. U.S.D.A. Office of Information.

6. FOR BETTER FISHING; FS1193. I.S.U. Publications.
7. TROUT FARMING; No. 552. U.S.D.A. Office of Information.
8. FISHERIES AS A PROFESSION; American Fisheries Society.
9. CATFISH FARMING: A NEW FARM CROP; F2244. U.S.D.A. Office of Information 1969.
10. TROUT PONDS FOR RECREATION; F2249. U.S.D.A. Office of Information. 1971.
11. TROUT FARMING: COULD TROUT FARMING BE PROFITABLE FOR YOU?; L5521. U.S.D.A. Office of Information. 1969.

#### Forest Resource Management

1. IOWA CHRISTMAS TREE PRODUCERS; F283. I.S.U. Publications.
2. DIRECTORY OF SAWMILLS AND VENEER MILLS OF IOWA; Pm364. I.S.U. Publications.
3. THE WAY TO WOODS PROFITS IN IOWA; F210. I.S.U. Publications.
4. KNOW YOUR TREES; C12. Cornell University.
5. CHRISTMAS TREES - A CASH CROP; C15. Cornell University.
6. FOREST ACTIVITIES - A GUIDE FOR YOUTH GROUP LEADERS; PA457. U.S.D.A. Office of Information. 1970.
7. TREE WINDBREAKS FOR THE CENTRAL GREAT PLAINS; AH250. U.S.D.A. Office of Information. 1964.
8. YOUR WATER SUPPLY & FORESTS; AB305. U.S.D.A. Office of Information. 1971.
9. SPECIAL FOREST PRODUCTS FOR PROFIT; AB278. U.S.D.A. Office of Information. 1963.
10. SHELTERBELTS FOR THE NORTHERN GREAT PLAINS; F2109. U.S.D.A. Office of Information. 1966.
11. PLANTING BLACK WALNUT FOR TIMBER; L487. U.S.D.A. Office of Information. 1971.
12. SELECTING AND PLANTING WINDBREAK TREES; Pm360. I.S.U. Publications.
13. FORESTRY; I.S.U. Publications.
14. SELECTION & MAINTENANCE OF NATURAL CHRISTMAS TREES; F293. I.S.U. Publications.
15. MANAGE YOUR FARM WOODLAND FOR GREATER PROFIT; Pm217. I.S.U. Publications.
16. MARKETING IOWA TIMBER; Pm413. I.S.U. Publications.
17. PROPERTIES & USES OF IOWA HARDWOODS; Pm329. I.S.U. Publications.
18. SHADE TREES FOR IOWA; Pm330. I.S.U. Publications.
19. PULPWOOD: A NEW MARKET FOR IOWA TREES; FS990. I.S.U. Publications.
20. LIFE IN A LOG; WL27. I.S.U. Publications.
21. GROWING BLACK WALNUT IN IOWA; Pm426. I.S.U. Publications.
22. TREE PLANTING IN IOWA; Pm496. I.S.U. Publications.
23. HOW TO PLANT TREES; Pm530. I.S.U. Publications.
24. MANAGING THE FAMILY FOREST; No. 2187. U.S.D.A. Office of Information.

#### Land Use Planning

1. MODERN INCINERATION: A SOLUTION-NOT THE ANSWER; Incineration Institute of America.
2. MAP OF COAL AREA IN THE UNITED STATES; National Coal Association.
3. COAL; National Coal Association.

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4. SWINE WASTE MANAGEMENT - folder; I.S.U. Department of Agricultural Education.
5. SOLID WASTE MANAGEMENT; Magazine. R.R.J. Publishing Company.
6. SANITARY LANDFILL; 2nd Edition. John Deere, Inc.
7. SANITARY LANDFILL FACTS; No. 1792. U.S. Government Printing Office.
8. FARMSTEAD SEWAGE & REFUSE DISPOSAL; AB274. U.S.D.A. Office of Information. 1963.
9. THE WAY & HOW TO RURAL ZONING; AB196. U.S.D.A. Office of Information. 1967.
10. ZONING FOR RURAL AREAS; L510. U.S.D.A. Office of Information. 1970.
11. SOILS & SEPTIC TANKS; AB349. U.S.D.A. Office of Information. 1971.
12. RESTORING SURFACE-MINED LAND; M1082. U.S.D.A. Office of Information. 1968.

#### Outdoor Recreation Planning

1. RECREATION IN SMALL WATERSHED PROJECTS; PA610. U.S. Soil Conservation Service.
2. RURAL RECREATION ENTERPRISES FOR PROFIT; No. 277. U.S.D.A. Office of Information.
3. RURAL RECREATION; No. 930. U.S.D.A. Office of Information.
4. RURAL RECREATION ENTERPRISES; FS1296. I.S.U. Publications.
5. CAMPING; PA502. U.S.D.A. Office of Information.
6. HOW DO IOWANS USE THEIR LAKES FOR RECREATION?; FS1316. I.S.U. Publications.
7. DEVELOPING WATER AREAS FOR OUTDOOR RECREATIONS; FS1365. I.S.U. Publications.
8. SHORT CUTS TO MAKING AN ACCURATE SCALES MAP; LA188. I.S.U. Publications.
9. OUTDOOR RECREATION ENTERPRISES A NEW SOURCE OF INCOME IN IOWA; FS1194. I.S.U. Publications.
10. USING IOWA'S PRAIRIE SPECIES TO FIGHT ROADSIDE WEEDS; FS1285. I.S.U. Publications.
11. THE QUALITY OF OUTDOOR RECREATION: AS EVIDENCED BY USER SATISFACTION; Superintendent of Documents.
12. OUTDOOR RECREATION OF AMERICA; Superintendent of Documents.
13. MANUAL OF OUTDOOR CONSERVATION EDUCATION; National Audubon Society.
14. OUTDOOR LIVING; MWPS-12. University of Illinois.
15. OUTDOOR LIVING: PLANNING & CONSTRUCTION GUIDE; Cornell University.
16. MAKE YOUR FARM POND SAFE - PREVENT DROWNINGS; PA396. U.S.D.A. Office of Information. 1971.
17. PONDS FOR WATER SUPPLY & RECREATIONAL; AH387. U.S.D.A. Office of Information. 1971.
18. MORE HUNTING, FISHING & HIKING SPACE; PA793. U.S.D.A. Office of Information. 1967.

#### Soil Conservation

1. CONTROLLING EROSION ON CONSTRUCTION SITES; No. 347. Soil Conservation Service.

2. SEDIMENTS: ITS FILLING HARBORS, LAKES & ROADSIDE DITCHES: S.C.S.
3. GRASS WATERWAYS; No. 4021. Illinois Vocational Agriculture Service.
4. CONTOURING; No. 4036. Illinois Vocational Agriculture Service.
5. TERRACING; No. 4038. Illinois Vocational Agriculture Service.
6. SOIL CONSERVATION SERVICE; PA818. S.C.S.
7. ASSISTANCE AVAILABLE FROM THE SOIL CONSERVATION SERVICE; No. 345. U.S. Government Printing Office.
8. HOW TO CONTROL A GULLY; No. 2171. U.S. Government Printing Office.
9. MULCH TILLAGE IN MODERN FARMING; U.S. Government Printing Office.
10. SOIL & WATER CONSERVATION: WHAT, WHY & HOW; Ohio State University.
11. DEFINING SOIL & WATERSHED; Ohio State University.
12. WHAT ARE THE RESPONSIBILITIES OF A SOIL & WATER DISTRICT EMPLOYEE; Ohio State University.
13. SURVEYING; Ohio State University.
14. ENGINEERING CONSTRUCTION STRUCTURES & PRACTICES; Ohio State University.
15. GRASS WATERWAYS & TERRACE OUTLETS; Pm 166. I.S.U. Publications.
16. WINDBREAKS FOR CONSERVATION; No. 339. S.C.S.
17. TO SAVE THE EARTH; National Wildlife Federation.
18. THE MEASURE OF OUR LAND; PA128. S.C.S.
19. LAND IN A NEW LIGHT; C2. Cornell University.
20. KNOW YOUR SOIL; AB267. U.S.D.A. Office of Information. 1970.
21. SOIL CONSTRUCTION DISTRICT: WHAT THEY ARE, HOW THEY WORK, HOW SCS HELPS THEM; PA417. U.S.D.A. Office of Information. 1968.
22. SOIL EROSION...THE WORK OF UNCONTROLLED WATER; AB260. U.S.D.A. Office of Information.
23. GRASS WATERWAYS IN SOIL CONSERVATION; L477. U.S.D.A. Office of Information.

#### Water Resource Management

1. CLEAN WATER: IT'S UP TO YOU; Izakk Walton League of America.
2. WHAT YOU CAN DO ABOUT WATER POLLUTION; Environmental Protection Agency.
3. WATER POLLUTION CONTROL - PROGRESS REPORT; Iowa Water Pollution Control Commission.
4. CONSERVATION & THE WATER CYCLE; No. 326. S.C.S.
5. UNTREATED SEWAGE: A COMMUNITY MENACE; Portland Cement Association.
6. A NEW PROCESS FOR TREATING WASTEWATER; PHYSICAL-CHEMICAL TREATMENT; Environmental Protection Agency.
7. A NEW PROCESS FOR TREATING WASTEWATER: PHOSPHORUS REMOVAL; Environmental Protection Agency.
8. UPGRADING EXISTING WASTEWATER TREATMENT FACILITIES; Environmental Protection Agency.
9. SOILS SUITABLE FOR SEPTIC TANK FILTER FIELDS; No. 243. S.C.S.
10. A PRIMER ON WASTE WATER TREATMENT; Water Pollution Control Federation.
11. CONTROLLING PLANT & ANIMAL PESTS IN FARM PONDS WITH COPPER SULFATE; Phelps Dodge Refining Corporation.
12. WHAT YOU CAN DO ABOUT WATER POLLUTION; U.S.D.I.

13. SOME ASPECTS OF WATER RESOURCE DEVELOPMENT; C1. Cornell University.
14. CONSERVATION & THE WATER CYCLE; AB326. U.S.D.A. Office of Information. 1967.
15. PONDS FOR WATER SUPPLY & RECREATION; AH387. U.S.D.A. Office of Information. 1971.

Wildlife Management

1. ENDANGERED SPECIES; National Wildlife Federation.
2. PRINCIPLES OF GAME MANAGEMENT; C26. Cornell University.
3. MAKE LAND PRODUCE USEFUL WILDLIFE; F2035. U.S.D.A. Office of Information. 1969.
4. MORE WILDLIFE THROUGH SOIL & WATER CONSERVATION; AB175. U.D.S.A. Office of Information.
5. PONDS & MARSHES FOR WILD DUCKS ON FARM & RANCHES IN THE NORTHERN PLAINS; F2234. U.S.D.A. Office of Information. 1968.
6. WILDLIFE OF TOMORROW; PA989. U.S.D.A. Office of Information. 1972.
7. WILDLIFE, THE ENVIRONMENTAL BAROMETER; Wildlife Management Institute.
8. AUTUMN OLIVE FOR WILDLIFE & OTHER CONSERVATION USES; U.S.D.A. Superintendent of Documents.
9. WILDLIFE OF FOREST & RANGELANDS; National Wildlife Federation.
10. WILDLIFE OF STREAMS, LAKES & RIVERS; National Wildlife Federation.
11. WILDLIFE OF FARM & FIELD; National Wildlife Federation.
12. THE FARMER & WILDLIFE; Wildlife Management Institute.
13. ROLE OF HABITAT IN THE DISTRIBUTION & ABUNDANCE OF MARSH BIRDS; SR43. I.S.U. Publications.
14. THE RUFFED GROUSE; FS1292. I.S.U. Publications.
15. IOWA BIRD MIGRATION CALENDAR; WL32. I.S.U. Publications.
16. IMPROVING HOME GROUNDS FOR BIRDS & ANIMALS; WL35. I.S.U. Publications.
17. IT'S FAWNING TIME AGAIN; FS9657. I.S.U. Publications.
18. WHAT'S IN THAT MARSH?; FS965. I.S.U. Publications.
19. SIGNS OF GOOD HUNTING & FISHING; Program Aid 1012. S.C.S.
20. A PEEK AT WILDLIFE; State Conservation Commission.
21. WILDLIFE, A MEASURE OF OUR ENVIRONMENT; PA965. U.S.D.A. of Information.
22. BY WHICH WE LIVE; National Wildlife Federation.
23. INVITE BIRDS TO YOUR HOME; PA982. Superintendent of Documents.

Books:

1. CAREER EDUCATION IN THE NATURAL RESOURCES: A SUGGESTED HIGH SCHOOL CURRICULUM GUIDE; U.S. Office of Education.
2. NATURAL RESOURCES & ENVIRONMENTAL AWARENESS: A TEACHER'S GUIDE FOR GRADES K-6; U.S. Office of Education.
3. EXPLORING OCCUPATIONS IN NATURAL RESOURCES: A RESOURCE GUIDE FOR GRADES 7-8-9-; U.S. Office of Education.
4. NATURAL RESOURCES TECHNOLOGIES: A SUGGESTED POST HIGH SCHOOL PROGRAM DEVELOPMENT GUIDE; U.S. Office of Education.
5. OUR NATURAL RESOURCES; McHall & Kircher. Interstate. 1970.

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6. YOUR ENVIRONMENT: AIR, AIR POLLUTION & WEATHER; Henson. Interstate. 1971.
7. ENVIRONMENT CONSERVATION; Dasman. John Wiley & Son, Son.
8. EROSION & SEDIMENT POLLUTION CONTROL; Beasley. I.S.U. Press.
9. OUTDOOR U.S.A.; Yearbook of Agriculture. 1967. U.S. Government Printing Office.
10. POLLUTION PRIMER; National Tuberculosis & Respiratory Disease Association.
11. RURAL RECREATION FOR PROFIT; Smith, Partain & Champlin. Interstate.
12. FOREST & FORESTRY; Anderson & Smith. Interstate.
13. APPROVED PRACTICES IN SOIL CONSERVATION; Foster. Interstate.
14. AGRICULTURE RESOURCES & FORESTRY; Curtis, Vogler & Wright. Interstate.
15. UNDERSTANDING ECOLOGY; J. Weston Walch.
16. TOO MANY PEOPLE; J. Weston Walch. 1971.
17. AIR POLLUTION EXPERIMENTS FOR JUNIORS & SENIOR HIGH SCHOOL SCIENCE CLASSES; Air Pollution Control Association. 1972.
18. MUNICIPAL REFUSE DISPOSAL; American Public Works Association.
19. INTRODUCTION TO ENVIRONMENTAL PROTECTION; Ohio State University.
20. WATER SUPPLY & WASTE DISPOSAL; Hardenbergh & Rodie. International Textbook Company. 1961.
21. WATER & WASTE; Stephens. St. Martin Press. 1967.
22. THE SOIL CONSERVATION STORY; Allis-Chalmers Mfg. Company.
23. A PRIMER ON AGRICULTURE POLLUTION; Soil Conservation Society of America.
24. ENVIRONMENTAL QUALITY & THE CITIZEN; Soil Conservation Society of America.
25. GUIDELINES TO CONSERVATION EDUCATION ACTION; Izaak Walton League of America.
26. BUILD OUR AMERICAN COMMUNITIES; O-387-949. U.S.D.A. 1970.
27. CONSERVATION TOOLS FOR EDUCATION; Conservation Education Office.
28. AGRICULTURE PRACTICES & WATER QUALITY; Willrich & Smith. I.S.U. Press.
29. FORESTRY & ITS CAREER OPPORTUNITIES; Shirley, Hardy. McGraw-Hill.
30. DEVELOPING FARM WOODLANDS; Preston. McGraw-Hill.
31. FORESTRY & FARM MANAGEMENT; Westveld, Peck. Wiley & Sons, Inc.
32. PHEASANTS IN NORTH AMERICA; Allen. Stackpole Books.
33. E.P. THE NEW CONSERVATION; Griffith, Landin & Jostad. Izaak Walton League of America.
34. RECREATIONAL USE OF WILD LAND; Brockman & Frank. McGraw-Hill. 1973.
35. ELEMENTS OF OUTDOOR RECREATION PLANNING; Driver. School of Natural Resources, University of Michigan.
36. A FIELD GUIDE TO THE MANUALS; Grossenheider. National Audubon Society.
37. FAMILIES OF BIRDS; Weston Publishing Company, Inc.
38. MANAGEMENT OF ARTIFICIAL LAKES & PONDS; Bennett, George & Van Nostrand. I.S.U. Book Store.
39. IOWA FISH & FISHING; Iowa Conservation Commission.
40. MAMMALS OF MISSOURI; Schwartz. University of Missouri or I.S.U. Book Store.
41. TIMBER! PROBLEMS, PROSPECTS, POLICIES; William Dverr. I.S.U. Press.

42. WATER POLLUTION CONTROL & ABATEMENT; Willrich & Hanes. I.S.U. Press.

SOURCES OF REFERENCES AND INSTRUCTIONAL AIDS

1. Agricultural Stabilization and Conservation Service  
(see local county office)
2. Air Pollution Control Commission  
4400 5th Avenue  
Pittsburg, Pennsylvania 15213
3. Allis-Chalmers Mfg. Company  
Construction Machinery Division  
Milwaukee, Wisconsin 53201
4. Aluminum Association  
750 3rd Avenue  
New York, New York 10017
5. American Fisheries Society  
1040 Washington Building  
15th Street and New York Avenue, N.W.  
Washington, D.C. 20005
6. American Petroleum Institute  
Committee on Public Affairs  
1271 Avenue of the Americas  
New York, New York 10020
7. American Public Works Association  
1313 East 60th Street  
Chicago, Illinois 60637
8. American Pulpwood Association  
605 3rd Avenue  
New York, New York 10016
9. American Water Works Association  
2 Park Avenue  
New York, New York 10016
10. Associate Films, Inc.  
Regional Film Center  
561 Hillgrave Avenue  
LaGrand, Illinois 60525
11. Bay's Branch Wildlife Refuge  
Guthrie Center, Iowa 50115
12. Bureau of Audio Visual Instruction  
1327 University Avenue  
P.O. Box 2093  
Madison, Wisconsin 53715



13. California Polytechnic State University  
Vocational Education Production  
San Luis Obispo, California 93401
14. Colorado Mining Association  
402 Majestic Building  
290 South 16th Street  
Denver, Colorado 80202
15. Conservation Education Officer  
U.S. Forest Service  
P.O. Box 3623  
Portland, Oregon 97208
16. Cornell University  
Instructional Materials Services  
Department of Education  
Room 201, Stone Hall  
Ithaca, New York 14850
17. Coronet Instructional Materials  
65 East South Street  
Chicago, Illinois 60601
18. Department of Environmental Quality  
Lucas State Office Building  
Des Moines, Iowa 50319
19. Environmental Protection Agency  
Technology Transfer  
Washington, D.C. 20460
20. Farmland Industries  
Department 37  
P.O. Box 7305  
Kansas City, Missouri 64016
21. Hach Chemical Company  
P.O. Box 907  
Ames, Iowa 50010
22. Illinois Environmental Protection Agency  
Division of Noise Pollution Control  
2200 Churchill Road  
Springfield, Illinois 62706
23. Illinois, University of  
Visual Aids Service  
Division University Extension  
Champaign, Illinois 61820

24. Illinois, University of  
Vocational Agriculture Service  
College of Agriculture  
Urbana, Illinois 61820
25. Incinerator Insitute of America  
60 East 42nd Street  
New York, New York 10017
26. IAVIM Center  
Attention: Thomas A. Hoerner  
Agricultural Engineering Department  
Iowa State University  
Ames, Iowa 50010
27. International Textbook Company  
Scranton, Pennsylvania 18501
28. Interstate Printers and Publishers, Inc.  
Danville, Illinois 61832
29. Iowa Conservation Commission  
State Office Building  
300 4th Street  
Des Moines, Iowa 50319
30. Iowa Ornithologists' Union  
2314 Helmer Street  
Sioux City, Iowa 51103
31. Iowa State University  
Department of Agricultural Education  
223 Curtiss Hall  
Ames, Iowa 51101
32. Iowa State University  
Civil Engineering Department  
394 Town Engineering Building  
Ames, Iowa 50010
33. Iowa State University  
Extension Forestry  
253 Bessey Hall  
Ames, Iowa 50010
34. Iowa State University  
Media Resources Center  
121 Pearson Hall  
Ames, Iowa 50010
35. Iowa State University  
Dr. Robert Moorman  
Extension Wildlifer  
Science Building  
Ames, Iowa 50010

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36. Iowa State University  
Mr. Burl Parks  
Landscape Architecture  
Ames, Iowa 50010
37. Iowa State University  
Publications Distribution Center  
Printing and Publications Building  
Ames, Iowa 50010
38. Iowa State University  
Press Building  
Ames, Iowa 50010
39. Iowa Water Pollution Control Commission  
State Department of Health  
Box 344  
Clear Lake, Iowa 50428
40. Izaak Walton League of America  
1326 Waukegon Road  
Glenview, Illinois 60025
41. John Deere, Inc.  
Moline, Illinois 61265
42. John Hall Film Service  
1923 West Atkinson Street  
Milwaukee, Wisconsin 53212
43. J. Weston Walch  
Portland, Maine 04104
44. Kent Feed, Inc.  
Education Department  
Muscatine, Iowa 52761
45. Maryland State Department of Education  
Department of Vocational-Technical Education  
P.O. Box 8718  
Friendship International Airport  
Baltimore, Maryland 21240
46. 3 M Company  
Education Services  
Box 3100  
St. Paul, Minnesota 55101
47. McGraw-Hill Book Company  
1221 Avenue of the Americas  
New York, New York 10020

48. Missouri Water Pollution Board  
P.O. Box 154  
Jefferson City, Missouri 65100
49. Modern Talking Picture Service  
200 3rd Avenue, S.W.  
Cedar Rapids, Iowa 52406
50. National Association of Conservation Districts  
Environment Film Service  
P.O. Box 855  
League City, Texas 77573
51. National Audubon Society  
950 3rd Avenue  
New York, New York 10022
52. National Coal Association  
Coal Building  
1130 17th Street, N.W.  
Washington, D.C. 20005
53. National Medical Audio-Visual Center  
Station K  
Atlanta, Georgia 30324
54. National Particleboard Association  
711 14th Street, N.W.  
Washington, D.C. 20005
55. National Wildlife Federation  
Education Service Section  
1412 16th Street, N.W.  
Washington, D.C. 20036
56. North Carolina Department of Public Instruction  
Raleigh, North Carolina 27601
57. Oklahoma Department of Vocational-Technical Education  
Stillwater, Oklahoma 74074
58. Olin Mathieson Chemical Corporation  
East Alton, Illinois 62024
59. Ohio State University  
Agricultural Education Curriculum Materials Service  
Room 201, 2120 Fytte Road  
Columbus, Ohio 43210
60. Phelps Dodge Refining Corporation  
300 Park Avenue  
New York, New York 10022

61. Portland Cement Association  
33 West Grand Avenue  
Chicago 10, Illinois 60610
62. R.R.J. Publishing Corporation  
150 East 52nd Street  
New York, New York 10022
63. Shell Film Library  
450 North Meridian Street  
Indianapolis, Indiana 46204
64. Soil Conservation Service  
823 Federal Building  
Des Moines, Iowa 50309
65. Springbrook Conservation Education Center  
Curt Powell, Director  
Guthrie Center, Iowa 50115
66. Soil Conservation Society of America, Inc.  
7515 N.E. Ankeny Road  
Ankeny, Iowa 50021
67. StackPole Books  
Cameron & Kelker Streets  
Harrisburg, Pennsylvania 17105
68. Standard Oil Division  
American Oil Company  
Farm & Home Department  
Box 4040  
St. Paul, Minnesota 55116
69. Statistical Reporting Service  
Agricultural Statistician  
Federal Building Room 855  
210 Walnut Street  
Des Moines, Iowa 50309
70. St. Martins Press  
175 Fifth Avenue  
New York, New York 10010
71. Successful Farming  
Reader Service  
Des Moines, Iowa 50309
72. Texas A & M University  
Vocational Instructional Service  
F.E. Box 182  
College Station, Texas 77843

73. Tuberculosis & Respiratory Disease Association  
(see local medical people)
74. U.S. Department of Agriculture  
Motion Picture Service  
Office of Information  
Washington, D.C. 20250
75. U.S. Department of Agriculture  
Office of Information  
Washington, D.C. 20250
76. U.S. Department of Agriculture  
Photograph Division  
Office of Information  
Washington, D.C. 20250
77. U.S. Department of Interior  
Federal Water Pollution Control Administration  
U.S. Government Printing Office  
Washington, D.C. 20250
78. U.S. Government Printing Office  
Superintendent of Documents  
Washington, D.C. 20402
79. Water Pollution Control Federation  
3900 Wisconsin Avenue  
Washington, D.C. 20016
80. Weston Publishing Company, Inc.  
Racine, Wisconsin 53401
81. Wildlife Management Institute  
709 Wire Building  
Washington, D.C. 20005
82. Wildlife Society  
Suite S-176  
3900 Wisconsin Avenue, N.W.  
Washington, D.C. 20016
83. Wiley & Son, Inc.  
605 Third Avenue  
New York, New York 10016
84. Wisconsin, University of  
Department of Natural Resources  
208 Agriculture Hall  
Madison, Wisconsin 53701
85. Bulletin Room  
Extension Building  
South Dakota State University  
Brookings, South Dakota 57006

## SUPPORTING AREAS OF INSTRUCTION

## 1. Supervised Occupation Experience

## Example Performance Objectives:

1. The student will be able to identify productive, improvement and supplementary projects and explain the difference between the types of projects. The student will demonstrate the above by developing a list of ten productive enterprises, five improvement practices and five supplementary practices.
2. The student will survey the local community to identify possible occupational opportunities by administering a model survey.

## Content Outline:

- I. Conducting Supervised Occupational Experience Programs
  - A. Concept of supervised occupational experience
  - B. Responsibilities of student, instructor, employer, school
  - C. Labor laws
  - D. Training plans
  - E. Training sites
  - F. Training agreements
- II. Selecting Supervised Occupational Experience Program
  - A. Options open for occupational experience
    1. Entrepreneurship
    2. Cooperative work experience
    3. Laboratory or/and land laboratory
  - B. Personal preference
  - C. Occupational goals
  - D. Approved practices
  - E. Supplementary practices
  - F. Improvement activities
- III. Keeping Financial and Experience Records
  - A. Net worth statement

- B. Enterprise analysis
- C. Placement (work) experience records
- D. Efficiency factors
- E. Greenhand, Chapter Farmer, State Farmer, American Farmer applications
- F. Proficiency award applications
- G. Budgeting

Suggested Source Materials:

Bulletins

1. ADVERTISING AND PROMOTION, Student Manual, Ohio Agricultural Education Curriculum Materials Service.
2. ADVERTISING AND PROMOTION, Teacher's Guide, Ohio Agricultural Education Curriculum Materials Service.
3. AGRICULTURAL BUSINESS PROCEDURES, Illinois Vo-Ag Service, (40¢)
4. AGRICULTURAL SUPPLIES, AND SERVICE, Teacher's Guide, Ohio Agricultural Education Curriculum Materials Service.
5. AGRICULTURE, MORE THAN FARMING, CAREERS UNLIMITED, Future Farmers Supply Service.
6. AGRICULTURAL WORK EXPERIENCE, 1971, Theodore Shannon, Ohio Agricultural Education Curriculum Materials Service.
7. ALCOA INFORMATION AIDS CATALOG, Aluminum Company of America.
8. APPLYING FOR A JOB, Illinois Vo-Ag Service.
9. APPLICATION FOR A CERTIFICATE TO EMPLOY A STUDENT LEARNER, Form WH-205, Bureau of Labor, Des Moines, Iowa.
10. BETTER COMMUNICATIONS IN SMALL BUSINESSES, SBA 1.12:7, Small Business Administration.
11. BRINGING TOGETHER IOWA YOUTH AND AGRIBUSINESS, Dr. Louis Thompson, Associate Dean of Agriculture, College of Agriculture, Iowa State University.
12. BUDGETING AND SPENDING, Ohio Agricultural Education Curriculum Materials Service. (30¢)
13. BUILDING AN INSURANCE PROGRAM, Ohio Agricultural Education Curriculum Materials Service.
14. BUSINESS MONEY MANAGEMENT, Student Manual, Ohio Agricultural Education Curriculum Materials Service.
15. BUSINESS MONEY MANAGEMENT, Teacher's Guide, Ohio Agricultural Education Curriculum Materials Service.
16. BUSINESS PROCEDURES AND RECORDS, Student Manual, Ohio Agricultural Education Curriculum Materials Service.
17. BUSINESS PROCEDURES AND RECORDS, Teacher's Guide, Ohio Agricultural Education Curriculum Materials Service.
18. CATALOG OF LITERATURE, Aluminum Company of America.
19. CHOOSE YOUR CAREER IN AGRICULTURE, 1960, Hoard's Dairyman.
20. CREDIT, Ohio Agricultural Education Curriculum Materials Service.



21. DECIDING ON AND LOCATING YOUR KIND OF JOB, Ohio Agricultural Education Curriculum Materials Service. (30¢)
22. EDUCATION COOPERATION ACTIVITIES AND SERVICES OF AMERICAN IRON AND STEEL INSTITUTE CATALOG, American Iron and Steel Institute.
23. EMPLOYMENT OF STUDENT LEARNERS, WHPC Publication 1122, Bureau of Labor, Des Moines, Iowa.
24. EXPLORING CAREERS IN AGRICULTURE, 1963, Pennsylvania State University.
25. FAIR LABOR STANDARDS ACT OF 1938, as amended, WHPC Publication 1000, Bureau of Labor, Des Moines, Iowa.
26. FARMERS AND AGRICULTURE IN OUR ECONOMY, Illinois Vo-Ag Service.
27. FILMS AND FILMSTRIPS CATALOG, American Iron and Steel Institute.
28. GETTING ALONG ON YOUR JOB, Ohio Agricultural Education Curriculum Materials Service.
29. GETTING STARTED ON YOUR JOB, Ohio Agricultural Education Curriculum Materials Service. (30¢)
30. GETTING YOUR JOB, Ohio Agricultural Education Curriculum Materials Service. (30¢)
31. GUIDELINES AND PROCEDURES: DIRECTED WORK-EXPERIENCE PROGRAMS IN VOCATIONAL AGRICULTURAL EDUCATION, Cornell University.
32. A GUIDE TO CHILD-LABOR PROVISIONS OF THE FAIR LABOR STANDARDS ACT, WHPC Publication 1096, Child Labor Bulletin No. 101, Bureau of Labor, Des Moines, Iowa.
33. HUMAN RELATIONS IN AGRI-BUSINESS (UNIT 3), Clark, et al, Michigan Association of Teachers of Vocational Agriculture Services Committee.
34. HUMAN RELATIONS IN AGRICULTURAL BUSINESS, Illinois Vo-Ag Service. (15¢)
35. HUMAN RELATIONS IN AGRICULTURAL OCCUPATIONS, Ohio Agricultural Education Curriculum Materials Service.
36. HUMAN RELATIONS IN BUSINESS, Student Manual, Ohio Agricultural Education Curriculum Materials Service.
37. HUMAN RELATIONS IN BUSINESS, Teacher's Guide, Ohio Agricultural Education Curriculum Materials Service.
38. HOW FARMERS CONTRIBUTE TO AMERICAN'S PROSPERITY, A.O. Smith Harvestore Products, Inc.
39. HOW'RE THEY REALLY DOING DOWN ON THE FARM, New Holland Farm Equipment Company.
40. IOWA, WHERE INDUSTRY AND AGRICULTURE MEET, Des Moines Register and Tribune.
41. KEEPING RECORDS OF THE SUPERVISED FARMING PROGRAM, Illinois Vo-Ag Service.
42. KEEPING YOUR RECORDS STRAIGHT, Ohio Agricultural Education Curriculum Materials Service, (30¢)
43. MARKETING AGRICULTURAL PRODUCTS, Student Manual, Ohio Agricultural Education Curriculum Materials Service.
44. MARKETING AGRICULTURAL PRODUCTS, Teacher's Guide, Ohio Agricultural Education Curriculum Materials Service.
45. MOTION PICTURES (catalog), United States Steel Corporation.
46. OPPORTUNITIES IN AGRICULTURAL OCCUPATIONS AND THE EMPLOYEE WITHIN THE BUSINESS ORGANIZATION, Student Manual, Ohio Agricultural Education Curriculum Materials Service.

47. OPPORTUNITIES IN AGRICULTURAL OCCUPATIONS AND THE EMPLOYEE WITHIN THE BUSINESS ORGANIZATION, Teacher's Guide, Ohio Agricultural Education Curriculum Materials Service.
48. PLANNING FOR A CAREER IN AGRICULTURE, Student Handbook, Pennsylvania State University.
49. PLANNING FOR A CAREER IN AGRICULTURE, Teacher's Guide, Pennsylvania State University.
50. PERSONALITY AND SUCCESS, SBA 1.20:4, Small Business Administration.
51. PERSONNEL MANAGEMENT GUIDES FOR SMALL BUSINESS, SBA 1.12:26, Small Business Administration.
52. PROFIT IS WHERE YOU FIND IT, New Idea Company. (filmstrip & record)
53. READING LIST OF PUBLICATIONS AND CATALOG OF VISUAL AIDS, United States Steel Corporation.
54. REFERENCE AND AUDIO-VISUAL MATERIALS ON IRON AND STEEL CATALOG, American Iron and Steel Institute.
55. SALESMANSHIP IN AGRICULTURAL BUSINESS, Illinois Vo-Ag Service.
56. SAVINGS AND CHECKING ACCOUNTS, Ohio Agricultural Education Curriculum Materials Services. (30¢)
57. SELLING AND SALESMANSHIP, Student Manual, Ohio Agricultural Education Curriculum Materials Services.
58. SELLING AND SALESMANSHIP, Teacher's Guide, Ohio Agricultural Education Materials Services.
59. SHOULD YOU GO INTO AGRICULTURE, New York Life Insurance Company.
60. SIMPLIFYING WORK IN AN AGRICULTURAL BUSINESS, Illinois Vo-Ag Service. (35¢)
61. STARTING AND MANAGING A SMALL BUSINESS OF YOUR OWN, SBA 1.15:1, Small Business Administration.
62. TAKING CARE OF YOURSELF, Ohio Agricultural Education Curriculum Materials Service. (30¢)
63. THERE'S A NEW CHALLENGE IN AGRICULTURE, Dr. Louis Thompson, Iowa State University.
64. THE USE OF THE CASH REGISTER, Illinois Vo-Ag Service. (10¢)

Books:

1. THE ART AND SKILL OF GETTING ALONG WITH PEOPLE, Duvall, Sylvanus M., Prentice-Hall, Inc.
2. CAREERS IN AGRIBUSINESS AND INDUSTRY, Stone, A.A., The Interstate Printers and Publishers.
3. ESSENTIAL ASPECTS OF CAREER PLANNING AND DEVELOPMENT, Atherton-Mumphrey, 1969, The Interstate Printers and Publishers.
4. EXPERIENCE PROGRAMS FOR LEARNING VOCATIONS IN AGRICULTURE, Binkley-Hammonds, 1970, The Interstate Printers and Publishers.
5. HANDBOOK ON AGRICULTURAL EDUCATION IN PUBLIC SCHOOLS, Lloyd J. Phipps, 1970, The Interstate Printers and Publishers.
6. HANDBOOK OF AGRICULTURAL OCCUPATIONS, Hoover, 1969, The Interstate Printers and Publishers.
7. HOW TO WIN FRIENDS AND INFLUENCE PEOPLE, Carnegie, Dale, Pocket Books, Inc.
8. AN INTRODUCTION TO AGRICULTURAL BUSINESS AND INDUSTRY, Weyant, Hoover, McClay, 1965, The Interstate Printers and Publishers.

9. SUCCEEDING IN THE WORLD OF WORK, Kimbrell-Vinegard, 1970, McKnight and McKnight Publishing House.
10. TEACHING TAXES, Internal Revenue Service.

SOURCES OF REFERENCES AND INSTRUCTIONAL AIDS

1. Aluminum Company of America  
1254 Alcoa Building  
Pittsburg, Pennsylvania 15219
2. American Iron and Steel Institute  
150 East 42nd Street  
New York, New York 10017
3. A. O. Smith Harvestore Products, Inc.  
Contact local dealer
4. Clemson University  
Vocational Education Media Center  
Clemson, South Carolina 29631
5. Cornell University  
University Press  
124 Roberts Place  
Ithaca, New York 14850
6. CUNA Mutual Insurance Society  
Scholastic Program  
Box 391  
Madison, Wisconsin 53706
7. Des Moines Register and Tribune  
Des Moines, Iowa 50309
8. Dr. Louis Thompson  
Associate Dean of Agricultural, College of Agriculture  
Iowa State University  
Ames, Iowa 50010
9. Farmland Industries  
P.O. Box 7305  
Kansas City, Missouri 64116
10. Future Farmer's Supply Service  
Box 15130  
Alexandria, Virginia 22309
11. Hoard's Dairyman  
Ft. Atkinson, Wisconsin 53538
12. Internal Revenue Service  
Kansas City, Missouri 64106

13. The Interstate Printers and Publishers  
1927 North Jackson Street  
Danville, Illinois . 61832
14. Iowa Grain and Feed Association  
201 Shops Building  
Des Moines, Iowa 50309
15. IAVIM Center  
Attention: Thomas A. Hoerner  
Agricultural Engineering Department  
Iowa State University  
Ames, Iowa 50010
16. Iowa State University Media Resources Center  
121 Pearson Hall  
Iowa State University  
Ames, Iowa 50010
17. Kent Feeds, Inc.  
Education Department  
Muscatine, Iowa 52761
18. The Labor Commissioner  
Bureau of Labor  
State House  
Des Moines, Iowa 50319
19. McKnight and McKnight Publishing House  
Box 854  
Bloomington, Illinois 61701
20. Michigan Association of Teachers of Vocational Agriculture  
Services Committee  
Educational Services  
Michigan State University  
East Lansing, Michigan 48823
21. New Holland Farm Equipment Company  
Contact local dealer
22. New Idea Company  
Public Relations Department  
AVCO New Idea Farm Equipment Division  
Coldwater, Ohio 45828
23. New York Life Insurance Company  
51 Madison Avenue  
New York, New York 10010
24. Ohio Agricultural Education Curriculum Materials Services  
Room 201  
2120 Fyffe Road  
Columbus, Ohio 43210

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25. Pennsylvania State University  
Department of Agricultural Education  
University Park, Pennsylvania 16802
26. Pocket Books, Inc.  
1 West 39th Street  
New York, New York 10018
27. Prentice-Hall, Inc.  
Education Division  
Englewood Cliffs, New Jersey
28. Ralston-Purina Company  
St. Louis, Missouri 63199
29. Small Business Administration  
New Federal Building  
210 Walnut Street  
Des Moines, Iowa 50309
30. Toastmasters International  
P.O. Box 10400  
Santa Ana, California 92711
31. United States Steel Corporation  
Director of Public Relations  
71 Broadway  
New York, New York 10006
32. University of Illinois  
Visual Aids Service  
Division of University Extension  
Champaign, Illinois 61820
33. University of Illinois  
Vo-Ag Service  
University of Illinois at Urbana Champaign
34. University of Missouri  
Instructional Materials Laboratory  
8 Industrial Education Building  
University of Missouri-Columbia  
Columbia, Missouri 65201
35. University of Wisconsin  
Instructional Material Center  
Madison, Wisconsin 53706

## 2. Future Farmers of America

### Example Performance Objectives:

1. The FFA Chapter officers will complete, from memory, the opening and closing ceremonies at all regular FFA meetings in accordance with the FFA Manual.
2. The students will conduct the business meeting according to accepted procedures as set forth in Robert's Rules of Order and to a level of attainment as determined by the instructor.
3. The student will develop sufficient skill to participate at least once during his FFA membership in one of the FFA Proficiency Awards or contest areas at the state level.

### Content Outline:

- I. FFA as a part of Vo-Ag
- II. FFA Organization
  - A. National, state and local - origin, development and structure
  - B. Degrees and kinds of membership
  - C. Emblem, colors and paraphernalia
  - D. Motto, creed and response
  - E. Purposes
  - F. Conduct and dress
- III. National Activities
  - A. National convention
  - B. National FFA supply services, magazines and calendars
  - C. Work experience abroad
  - D. FFA Foundation, Inc.
  - E. National Leadership Conference
  - F. BOAC
- IV. State Activities
  - A. State convention
  - B. State FFA Newsletter

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- C. S. D. FFA Foundation, Inc.
- D. BOSDC
- E. State leadership camp
- F. State fair activities
- V. Chapter Operation
  - A. Eight essentials
  - B. Duties and responsibilities of officers and members
  - C. Parliamentary Procedure
  - D. Program of activities
  - E. Ceremonies
  - F. Meeting room organization
  - G. Leadership development
- VI. Alumni Association (local, state and national)
- VII. Contests Awards and Recognition
  - A. Proficiency awards (examples)
    - 1. Crop production
    - 2. Placement in sales and/or service
    - 3. Agricultural mechanics
    - 4. Oranamental horticulture
  - B. Educational contests (examples)
    - 1. Dairy products judging
    - 2. Speaking contest
    - 3. Livestock judging
    - 4. Poultry judging
    - 5. Ag mechanics
  - C. National chapter awards
  - D. National chapter safety awards
  - E. Degree advancement
  - F. BOAC
  - G. Educational activities sponsored by other agencies
    - 1. Loan program

2. Scholarships
3. Schools
4. Recognition awards
5. Locally sponsored activities
6. Other competitive activities

#### Suggested Source Materials:

##### Books:

1. A MORE EFFECTIVE FFA, Wall, Interstate Printers and Publishers, Danville, Illinois.
2. FORWARD FFA, W. A. Ross, National FFA Supply Service, Alexandria, Virginia.
3. HANDBOOK ON SPEECH FOR FUTURE FARMERS, R. D. Purkey, Interstate Printers and Publishers, Danville, Illinois.
4. HOW TO HOLD A BETTER MEETING, Frank Snell, Harper and Brothers, New York, New York.
5. HOW TO IMPROVE YOUR PERSONALITY, Roy Newton, McGraw-Hill Book Company, Inc., New York, New York.
6. HOW TO SPEAK AND WRITE FOR RURAL AUDIENCES, H. L. Cosline, Interstate Printers and Publishers, Danville, Illinois.
7. I DARE YOU, Danforth, Ralston Pruina, St. Louis, Missouri.
8. LEADERSHIP TRAINING AND PARLIAMETARY PROCEDURE FOR FFA, Gray and Jackson, Prentice Hall, Englewood Cliffs, New Jersey.
9. LIVE AND LEARN, E. R. Eastman, Interstate Printers and Publishers, Danville, Illinois.
10. PARLIAMETARY PROCEDURE, Alice F. Sturgis, McGraw-Hill Book Company, Inc., New York, New York.
11. PRACTICAL PARLIAMETARY PROCEDURE, R. M. Cruzan, McKnight and McKnight, Bloomington, Illinois.
12. PUBLIC SPEAKING FOR FUTURE FARMERS, L. S. Judson, Interstate Printers and Publishers, Danville, Illinois.
13. REPORTING FFA NEWS, Rogers, Interstate Printers and Publishers, Danville, Illinois.
14. ROBERT'S "RULES OF ORDER," Available in most book stores.
15. SO YOU WERE ELECTED, Bailard and McKown, McGraw-Hill Book Company, Inc., New York, New York.
16. SPEAK WITH EASE, R. C. ROSS, National Farm Book Company, Viroqua, Wisconsin.
17. THE FFA AND YOU, Bender, Clark and Taylor, Interstate Printers and Publishers, Danville, Illinois.
18. WHEN YOU PRESIDE, S. S. Sutherland, Interstate Printers and Publishers, Danville, Illinois.
19. WINNING FUTURE FARMERS SPEECHES, Volume I and Volume II, L. S. Judson, Interstate Printers and Publishers, Danville, Illinois.
20. YOUR OPPORTUNITIES IN VOCATIONAL AGRICULTURE, Phipps, Interstate Printers and Publishers, Danville, Illinois.
21. PARLIAMETARY GUIDE FOR FFA, Jarrell D. Gray, Box 717, Commerce, Texas.



Manuals or Magazines:

1. AGRIOPPORTUNITIES, National FFA Center, Alexandria, Virginia 22309.
2. A HANDBOOK FOR CONDUCTING FFA MEETINGS (Preliminary Parliamentary Procedure), K. E. Russell, Interstate Printers and Publishers, Danville, Illinois.
3. BOAC COMMUNITY ACTION PROGRAM BOOKLET, National FFA Center, Alexandria, Virginia 22309.
4. FFA OFFICIAL MANUAL, National FFA Supply Service, Alexandria, Virginia 22309.
5. FFA--THE NATIONAL ORGANIZATION FOR STUDENTS IN AGRIBUSINESS AND NATIONAL RESOURCES, National FFA Supply Service, Alexandria, Virginia 22309.
6. NATIONAL FFA CHAPTER SAFETY AWARD HANDBOOK, National FFA Center, Alexandria, Virginia 22309.
7. HANDBOOK FOR NATIONAL OFFICERS, The National FUTURE FARMER, Alexandria, Virginia 22309.
8. NATIONAL CONVENTION PROCEEDINGS, National Executive Secretary, National FFA Center, Alexandria, Virginia 22309.
9. THE FFA ORGANIZATION, National FFA Supply Service, Alexandria, Virginia 22309.
10. NATIONAL FFA CONTESTS (Bulletin No. 4), Future Farmers of America Foundation, Inc., National FFA Center, Alexandria, Virginia 22309.
11. THE NATIONAL FUTURE FARMER MAGAZINE, Alexandria, Virginia 22309.
12. CHAPTER CHAMPIONS (Ideas for Chapter Action), National FFA Center, Alexandria, Virginia 22309.
13. STUDENT PERFORMANCE OBJECTIVES, National FFA Center, Alexandria, Virginia 22309.
14. WHAT IS FFA TO YOU, National FFA Center, Alexandria, Virginia 22309.
15. THE AGRICULTURAL PROFICIENCY AWARD PROGRAM, Future Farmers of America Foundation, Inc., National FFA Center, Alexandria, Virginia 22309.

Pamphlets or Leaflets:

1. SO YOU WANT TO BE AN OFFICER IN THE FFA, Cornell Misc., Bulletin 40, New York State College of Agriculture, Ithaca, New York.
2. WORK EXPERIENCE ABROAD--PROGRAM INFORMATION, National FFA Center, Alexandria, Virginia 22309.
3. WEA--WHAT OTHERS SAY, National FFA Center, Alexandria, Virginia 22309.

FFA Foundation Booklets:

1. ANNUAL REPORT, Future Farmers of America Foundation, Inc., National FFA Center, Alexandria, Virginia 22309.
2. CONGRATULATIONS BOOKLET, Future Farmers of America Foundation, Inc., National FFA Center, Alexandria, Virginia 22309.
3. SPECIAL PROJECT BOOKLETS IN PROFICIENCY AWARDS, SAFETY and BOAC, Future Farmers of America Foundation, Inc., National FFA Center, Alexandria, Virginia 22309.
4. SPONSOR BOOKLET, Future Farmers of America Foundation, Inc., National FFA Center, Alexandria, Virginia 22309.

APPENDIX

## APPENDIX A

SIZE AND FACILITY SPECIFICATIONS:

## A. Classroom:

1. 35 to 45 square feet per student in largest class, minimum width of 24 feet, 900 square feet is desirable.
2. Entrance doors at least 3' wide
3. Students have at least 2 1/2' linear table space with tables not wider than 3'
4. Air intake and exhaust
5. Fluorescent lighting, 35-50 foot candles
6. Accoustically treated ceiling
7. Tile floor
8. Window height 5' to 6' above floor
9. A minimum window square footage at 10-15% of floor space
10. Ceiling height 10-14'
11. Chalkboard: 12'-16'
12. Bulletin board: 10'-12'
13. Adjoining laboratory if possible; 12' door to allow equipment to be rolled in classroom is desired.

## B. Office:

1. Recommend 200 square feet. If being used as conference room, add additional 100 square feet.
2. Window to classroom and shop
3. Door to outside entrance or to hall leading to outside
4. Door to classroom; third door could be to shop
5. Telephone
6. Lighting, ceiling, floor and ventilation smiliar to classroom

## C. Laboratory:

1. 20 square feet per student
2. If room adjacent to classroom, enclose by folding doors; space per student can be reduced to 10 square feet if part of classroom can be used as laboratory space.
3. Lighting, ceiling, floor, and ventilation similar to classroom
4. Laboratory equipment should include acid proof sink and bench top plus cabinet space for storage of equipment and supplies
5. May provide 2-3 study carrols for individualized instructional programs.

## D. Locker room:

1. Minimum 300 square feet
2. One small locker per boy or two boys per larger locker
3. Entry from classroom and/or shop
4. At least 1 stool, 1 urinal, and small sink for washing hands

5. Bradley fountain in shop for student use during shop cleanup
6. Lighting and ventilation similar to classroom

E. Classroom storage room:

1. 120 square feet
2. Prefer walk-in storage room rather than built-in cabinets in classroom
3. 3' wide door

F. Shop storage:

1. 300 square feet
2. Minimum length 20 feet
3. Prefer double entry doors for easier stocking and removal of materials
4. Two level storage will better utilize space, minimum 6 feet ceiling height on upper level, provide permanent staircase to upper level.
5. Provide adequate lighting

G. Outside area:

1. Outside storage building or open shed provides adequate yet inexpensive storage area for shop materials.
2. Area should be covered with concrete or crushed rock. If concrete is used, provide crushed rock area for steam cleaning of equipment.
3. Provide drain if slope is such that materials will not drain away from building
4. Area should be fenced or outlined with shrubs
5. Provide unloading dock
6. Outside area should have adequate lighting for unloading after dark and night-time protection of materials and equipment

H. Agricultural mechanics laboratory:

1. 150 square feet per student, minimum 2400 square feet
2. Width to length ratio of 1-1/2 to 2
3. Minimum width of 40 feet
4. Ceiling 14-16 feet high
5. Shop door: 16 feet wide, 14 feet high
6. All service doors at least 3' wide, provide service door near overhead door
7. Windows at least 6' off floor
8. No more than 10% of floor space in windows
9. Fluorescent lighting providing 35-40 foot candles over all work areas
10. Concrete floors, appropriately sealed
11. At least one floor drain
12. Hooded exhaust system in welding area, 2-speed exhaust fan
13. Air intake system

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14. Exhaust system for paint area, exhaust pickup should be near floor. Paint area should be separate from main shop; provide explosion proof lighting
15. General exhaust system for other than paint and welding area
16. Suggest wall type benches with roll-away storage units below benches
17. Non-skid paint around all stationary power equipment
18. Avoid placing electrical outlets in the floor - use wall outlets and ceiling drops

## APPENDIX B

SUGGESTED VOCATIONAL AGRICULTURE DEPARTMENT EQUIPMENT AND SUPPLIES

				<u>Source</u>
1	Pliers to apply livestock ear tags	\$ 5.00		1
6	Livestock marking paint sticks	1.80		1
1	Hog ear notcher	4.65		1
1	Animal clipper	58.00		1
1	Livestock hoof trimmer	19.25		1
1	Hog ringer	1.60		1
4	Swine backfat probes	1.00		1
1	Sheep and hog scale	360.00		1
1	Elastrator	12.50		1
1	Utility scale	16.20		1
1 ea.	Dairy cow, beef weight tapes	1.75		1
1	Egg scale	4.45		1
1	Metal stencil set, 2"	15.75		1
1	10cc. livestock syringe	4.65		1
3	Soil probes	26.55		1
1	Electric dehorner	21.00		1
1	Soil testing kit	55.50		1
1	Soil thermometer	2.00		1
1	Plant tissue test kit	20.00		1
1	pH meter	145.00		1
1	Crop moisture tester	142.00		1
1	Grain test weight tester	40.00		1
1	Pruning saw	8.00		1
2	Pruning shears	9.78		1
1	Pruning lopping shears	9.00		1
1	Indoor greenhouse	35.00		1
1	Land measuring wheel	60.00		1
1	Hand land level	12.00		1
 <u>Texts, References, and Teaching Aids</u>				
1 set	Successful Farming Vo Ag Teaching Kits	75.00		3
	Samples of Soil Textural Classes	8.15		1
	Nebraska Tractor Test Data	.75		4
	Metric Instructional Kit	22.50		4
Booklets	1 Sawhorse Layout w/ the Framing Square	.75		4
	1 Rafter Layout w/ the Framing Square	1.60		4
	1 Quality Concrete	1.60		4
	1 Micrometers, Calipers, Gages	2.00		4
	1 Torque and torque wrenches	2.00		4
	1 Fiberglass hog trough mold	30.00		4
	Crop Judging Kit (SDSU)	16.00		2
Copies	15 JD Engines Text @ 5.60 each	84.00		5
	15 JD Power Trains @ 4.30 each	64.00		5

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			<u>Source</u>
15	JD Hydraulics @ 4.30 each	\$ 64.50	5
15	JD Electrical Systems @ 5.15 each	77.25	5
	1 set of 10 FOS Texts	25.95	5
1	Tractors (FMO) JD	6.95	5
1	Safety (FMO) JD	6.95	5
1	Preventive Maintenance (FMO) JD	6.95	5
1	Combine Harvesting (FMO) JD	6.95	5
1	Tillage (FMO) JD	6.95	5
1	Planting (FMO) JD	6.95	5
1	Hay and Forage Harvesting (FMO) JD	6.95	5
1	Machinery Management (FMO) JD	5.95	5
1	(AAVIM) Planning an Individual Water System	4.35	6
1	(AAVIM) Maintaining the Lighting and Wiring System	2.55	6
1	(AAVIM) Electric Motors	2.10	6
1	(AAVIM) Building Fences	2.55	6
1 ea.	MWPS - Dairy Plan Book	2.00	6
	Beef Plan Book	2.00	6
	Sheep Plan Book	2.00	6
	Swine Plan Book	2.00	6
	Horse Plan Book	2.00	6
	(AAVIM)		
16	Small Engines, Vol. I @ 4.35 each	69.60	6
16	Small Engines, Vol. II @ 5.55 each	88.80	6
1	Farm Utility Buildings	2.40	6
1	Fuels and Lubricants	3.45	6
1	Understanding and Measuring Horsepower	2.55	6
1	Tractor Maintenance	4.05	6
16	Doane Farm Management Guide	87.36	7
1	Do It Right the First Time (farm law)	6.95	7
1	Agricultural Mathematics	4.70	7
1	Essential Aspects of Career Planning and Development	6.95	7
kit	1 Applying for a Job	3.95	7
	1 Succeeding on the Job	3.95	7
	1 Supervising on the Job	3.95	7
	1 Careers in Agribusiness and Industry	6.25	7
	1 Exploring Agribusiness	7.25	7
	1 Handbook of Agricultural Occupations	7.25	7
	1 Student Manual - An Introduction to Agricultural Business and Industry	3.75	7

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			<u>Source</u>
1	Teachers Guide - An Introduction to Agricultural Business and Industry	\$ 2.50	7
1	Raising Vegetables	6.25	7
1	Our Soils and Their Management	8.25	7
1	Modern Fruit Science	16.50	7
1	The Insect Guide	6.95	7
1	Using Commercial Fertilizers	6.25	7
16	Identification and Judging, Crops - Weeds - Diseases	28.00	7
1	The Stockman's Handbook	13.46	7
1	The FFA and You	6.95	7
1	Robert's Rules of Order	6.75	7
1	Feeds and Feeding	6.50	7
 <u>Texts, References, Aids, etc</u>			
1	Domestic Rabbit Production	5.50	7
1	Horses and Horsemanship	11.25	7
1	The Complete Dog Book	6.00	7
1	Hardware Identification Kit	7.25	7
1	Tool Identification Kit	6.25	7
1	Meat Identification Kit	7.50	7
16	Mechanics in Agriculture	143.20	7
1	600 More Things to Make for Farm and Home	5.95	7
1	Handbook of Livestock Equipment	7.25	7
16	Wiring Simplified	16.00	7
1	Manual for Sharpening Hand Wood Working Tools	1.00	7
1	The Farm Management Handbook	6.95	7
1	The Marketing of Livestock and Meat	8.25	7
16	Credit Units from Fed. Inter. Credit Bank	Free	8
1	Farm Power and Machinery Management	7.50	9
1	Farm Appraisal and Valuation	11.50	9
1	Better Farm Accounting	.60	9
16	Livestock and Poultry Production, 4th ed.	179.52	10
16	Profitable Soil Management	151.20	10
16	Crop Production	175.20	10
16	Leadership Training and Parliamentary Procedure for FFA	67.68	10
1 set	Ag 1,2,3,4, Vo-Ag Curriculum from Oklahoma	51.00	11
1 set	Ohio - Agriculture Work Experience Units student manuals	3.00	12



Agricultural Supplies Business and Service Related Class Units

			<u>Source</u>
16	Set of 7 student manuals per student	\$ 128.00	12
1 set	Teacher guides	4.50	12
1	Office Procedures Used in the Agricultural Services	3.25	12
1	Feeds (Student and Teacher Guides)	3.00	12
1	Ag Chemicals (Student and Teacher Guides)	3.25	12
1	Business Practices for Agricultural Machinery (Student and Teacher Guides) Dealers	4.50	12
1	The Greenhouse Worker	3.50	12
1 ea.	The Nursery Worker; Part I, Part II	4.50	12
1	Conservation Aide	5.35	12
16	Minn. Farm Account Book	53.60	13
1	Metals and Welding	7.50	4

Instructional and Office Equipment

4	Adding machines	320.00	1
1	Filmstrip cabinet	50.00	1

Filmstrips and SlidesFilmstrips

	Human Relations in Agribusiness	4.15	1
	Salesmanship in Agribusiness	4.15	1
	Careers in Farm Services	9.55	1
	Careers in Farm Supplies	9.55	1
	Tractor Maintenance (8 films)	77.60	1
	Calibrating Field Sprayers	4.45	1
	Calibrating a Granular Applicator	3.40	1
	Electrical Terms -- Their Meaning and Use	18.00	1
	How Farm Electrical Motors Start and Run	16.80	1
	Learning Arc Welding Skills	6.65	1
	Planting Corn	5.15	1
	Factors Affecting Classes and Grades of Soybeans	3.45	1
	Recognizing Herbicide Injury	4.60	1
	Judging Beef Cattle	6.00	1
	Let's Make Concrete	2.50	1
	Breeds of Dairy Cattle	3.25	1
	Fundamentals of Dairy Cattle Judging	6.00	1
	Starting to Keep Records	4.55	1
	Pruning Orchard Trees	6.00	1
	Preventing Transportation Losses of Livestock	3.40	1
	Parliamentary Procedure in Action	18.00	1
	Steps to a Better Lawn	4.90	1
	Applying for a Job	4.35	1

<u>Filmstrips-cont'd</u>		<u>Source</u>
Safe Use of Pesticides on the Farm	5.50	1
Selecting Breeding Sheep	5.05	1
Judging Sheep	6.00	1
Soil Texture	2.25	1
Soil Color	4.00	1
Soil Structure	1.95	1
Breeds of Swine	4.20	1
Swine Carcass Evaluation	7.80	1
Identification of Weeds (Part I & II)	6.90	1
Plan the Livestock System and Estimate		
Fertility Costs	4.05	15
Factors Affecting Classes and Grades of Wheat	4.25	15
Diseases of Soybeans	4.10	15
Product Competition	4.05	15
Product Knowledge	4.05	15
A Market For Your Product	4.05	15
Displaying Merchandise	4.55	15
 <u>Slides</u>		
Power Mechanics 2 and 4 Cycle Engines	10.55	1
Oxy - Acetylene Welding	17.50	1
Identification of Meat Cuts	39.30	1
U.S. Grades for Beef Carcasses	14.50	1
U.S. Swine and Pork Grades	14.50	1
Beef Carcass Judging and Grading	5.40	1
Diseases of Oats	6.00	1
Diseases of Wheat	6.00	1
Diseases of Corn	5.20	1
Culling Poultry	5.70	1
Judging Poultry, live and dressed	28.00	1
Life Cycle of Round Worm of Swine	2.70	1
How to Take a Soil Sample	4.50	14
Fertilizers a Paying Investment	12.15	14
Agriculture and Your Environment	11.00	14
Battery Ignition Systems	26.00	4
Carburetor	24.00	4
Reading the Micrometer	6.00	4
Torque and Torque Wrenches	7.00	4
Truss Rafter Layout	21.00	4
Fertilize Those Soybeans	7.00	16
Alfalfa for Top Profits	8.00	16
Soil and Its Properties	<u>10.50</u>	16
Grand Total	\$4129.15	

Additional teaching materials would include agricultural magazines, commercial publications, and college publications.

FOOTNOTES - SOURCES OF TEACHING MATERIALS

- 1Supplies available from Nacso, Ft. Atkinson, Wisconsin, Prices are from 1974-75, catalog #125
- 2Available from Plant Science Department at SDSU, Brookings, South Dakota 57006
- 3Successful Farming Magazine, Des Moines, Iowa, also from source #1
- 4Hobar Publications, 1305 Tiller Lane; St. Paul, Minnesota 55112
- 5Deere and Company, Distribution Service Center - Department S/P 1400 3rd Avenue, Moline, Illinois 61265
- 6Ag Engineering Department, SDSU, Brookings, South Dakota 57006
- 7Interstate Printers and Publishers, Inc., Danville, Illinois
- 8Farm Credit Banks of Omaha  
Box 1229  
Omaha, Nebraska 68101
- 9Iowa State University Press, Ames, Iowa 50010
- 10Prentice-Hall, Englewood Cliffs, New Jersey 07632
- 11State Department of Voc. and Tech. Ed., Curriculum and Instructional Materials Center, 1515 West Sixth Avenue, Stillwater, Oklahoma 74074
- 12Ohio Agricultural Education, Curriculum Materials Service, Room 254, 2120 Fyffe Road, Columbus, Ohio 43210
- 13Minnesota Vocational Materials Center  
Staple Area Vo-Tech Institute  
Staples, Minnesota 56479
- 14The Fertilizer Institute, 1015 18th Street, N.W., Washington, D.C. 20036
- 15Vocational Agriculture Service, 434 Mumford Hall, Urbana, Illinois 61801
- 16Potash Institute of North America, 1649 Tillie Circle, N.E., Atlanta, Georgia 30329

Vocational Agriculture Ag Mechanics Equipment

1	95#, blacksmith anvil	\$ 142.00
1	handy anvil (for sickle repair)	3.98
1	3' ripping bar	3.93
1	2' ripping bar	2.93
2	sliding T bevels @ \$3.65	7.30
1	strap type battery carrier	.85
1	set of 13 wood auger bits	23.65
2	countersink, (1/2" and 3/4")	4.55
1	set of 29 high speed twist drills	36.55
1	expansive bit	6.85
1	offset screwdriver	.85
12	assorted phillips and standard screwdrivers	25.00
2	braces, 10" sweep	12.50
1	wire wheel brush	20.00
1	safety gasoline can (5 gal.)	12.40
3	oil cans, Squirt	7.50
8	assorted cold chisels	10.96
6	"C" clamps	28.75
1	Bolt Cutter 9/16" cap.	31.35
1	glass cutter	1.12
1	pipe cutter	27.70
1	post hole digger	7.80
2	wing dividers	10.80
1	wheel dresser	2.33
2	Hand drills (1/4" cap.)	12.50
1	1/2" HD Elec. Drill	100.00
2	Concrete workers edgers	4.50
1	screw extractor set	5.00
1	flaring tool	6.15
2	elec. bench grinder (6")	180.00
1	concrete worker's wood float	.90
1	Groover, Concrete workers	2.50
1	3/8" hand groover, sheet metal	3.93

The Ag Mechanics Equipment prices used are from the 1974-75 Catalog of Midwest Shop Supplies; Sioux City, Iowa.

South Dakota State Surplus in Huron may be able to supply some of these and other items.

1	grease gun	\$ 5.45	
2	ball peen hammers; 1#, 2#	7.70	
12	claw hammers, 16 oz.	72.00	
1	8# sledge hammer	10.75	
1	Hatchet	10.89	
8	arc welding helmets	86.00	
1	"A" frame gantry, 2 ton cap. min.	350.00	
1	Trolley for gantry	63.00	
1	chain hoist, 2 ton cap.	337.00	
1	speed indicator	8.50	
1	hydraulic jack, 5 ton cap.	30.90	
2	draw knives, 14"	28.30	
4	putty knives	4.00	
2	trouble lamps	4.40	
2	carpenter's levels	16.60	
1	end cutting nippers	4.00	
2	mallets	6.00	
2	oil stone, combination	5.60	
1	block plane - 6"	6.70	
4	Jack planes - 14"	47.20	
1	jointer plane - 22"	22.35	
1	screw plate set	92.00	
6	pliers, comb. side cutting	9.30	
1	lineman's pliers	4.60	
2	longnose pliers	6.00	
1	plumb bob - chalk line	2.22	
1	gear puller, HD	18.35	
1	gear puller, small	9.35	
2	lining up punch	7.00	
2	Center punch	2.25	
1	leather punch	3.40	
4	pin punch	3.40	
2	solid punch	3.00	
1	reamer, pipe	3.55	
1	Rivet buster	3.30	
1	2' steel rule	5.65	
6	steel tapes (12')	30.00	
1	belt sander	125.00	
1	finishing sander	75.00	
1	sander-polisher	70.00	
1	bayonet saw	50.00	
1	Port. 7 $\frac{1}{4}$ " Skil-saw	92.00	
1	Table saw, 10"	508.00	(Prices vary
1	Radial arm saw, 12"	400.00	widely)
1	mitre box and saw	90.00	
1	compass saw, 12"	2.14	
1	metal cutting bandsaw	568.00	
4	crosscut saws, 8 and 10 point, 26"	20.60	
2	hacksaws	7.70	
1	keyhole saw	1.97	
2	rip saws (5 and 6 point) 26"	20.60	
2	carbon scrapers	1.92	
4	nail sets	2.30	

2	rivet sets	\$ 7.00
1	saw set	8.55
1	round point shovel	6.55
1	shop vacuum	78.00
1	round point shovel	6.35
1	spade	6.20
2	tin snips	13.00
2	Elec. soldering guns	25.80
2	spoke shaves	6.50
1	combination square	4.00
10	carpenter's square	61.50
2	try squares	6.00
1	100' steel tape	12.75
2	Forge tongs	26.00
4	oxy-acetylene welding outfits w/cutting torches	672.00
4	vises, machinists	260.00
1	drill press, floor model	340.00
1	drill press, vise	23.00
1	pipe vise	44.00
4	wood working vises	134.48
4	arc welders, w/carbon arc torches (may need more welding machines)	520.00
1	wire stretcher	10.30
6	adjustable wrenches, 8", 10", 12", 18"	35.00
1	set, box wrenches	14.20
2	set, box open end wrenches	63.20
1	set ingition wrenches	12.55
3	pipe wrenches	33.65
1	socket set, 32 pieces (1/4", 1/2" drive)	56.00
1	allen wrench set	2.58
1	vise grip chain wrench	5.80
2	vise grips	5.00
1	socket set, 3/8" drive, 19 pieces	28.00
1	battery cell tester	14.00
2	cotter pin puller	4.30
2	auto creepers	29.00
1	air compressor (2 stage, 3 HP)	1150.00
1	timing light	22.00
1	torque wrench	40.00
1	AC ohmmeter	5.10
1	AC voltmeter	5.50
2	propane torch kits	22.00
1	feeler gauge	1.98
1	spark plug gap gauge	.53
1	universal nut cracker	7.97
1	tire wrench	4.37
1	glaze breaker	15.00
1	ridge reamer	16.67
4	ring compressors	10.72
5	Valve spring compressor	24.82
1	spray gun, paint etc.	46.00
1	micrometer set	86.00

1	set telescoping gauges	\$ 33.75
1	tubing cutter	5.00
1	adj. slip joint pliers, 16"	6.47
4	diagonal pliers	19.48
1	assorted wood chisels, set	32.35
2	3/8" electric drill	85.00
1	HD hand stapler	15.00
4	bar clamps	42.60
1	elec. circuit tester	1.07
1	HD, 12" floor grinder	438.00
1	conduit bender	31.00
4	misc. chipping hammers	23.56
1	4 piece set of masonry bits	5.00
1	set, 7 piece wood boring bits	5.00
4	bench brushes	7.20
4	floor brushes	28.00
6	paint brushes	12.00
8	assorted files	16.00
1	first-aid kit	10.00

Miscellaneous

welding rods  
 glue, sandpaper and operating supplies  
 wire, automatic controls and switches for electrical instruction  
 surveyor's transit  
 battery charger  
 metal shears; metal bender  
 cam dwell meter  
 welding booth - benches (student made)  
 storage cabinets

1	forge furnace	\$ 573.00
1	tire pressure tester	4.50
1	high pressure sprayer-washer	500.00
1	compression tester	3.55
1	piston groove cleaner	2.21
1	elec. demo. panel	250.00
20	pair safety glasses	26.00
1	safety glass sanitizor cabinet	130.90
4	B&S gas engines, 3 hp.	<u>240.00</u>

Grand Total    \$10,719.28

## APPENDIX C

EXAMPLES OF SUGGESTED PROGRAM EVALUATION INSTRUMENTS

- A. National Chapter Award Program - Chapter Guide to FFA Activities
- B. Vocational Agriculture Department Evaluation (State Supervisor form), Division of Vocational Education, Pierre, South Dakota.
- C. A Partial Guide For Constructing a Student Follow-up Instrument, Appendix C, Locally Directed Evaluation of Local Vocational Education Program, available from Department of Secondary Education and Curriculum, College of Education, Michigan State University, East Lansing, Michigan.
- D. Guidelines for Evaluation of Local Programs of Vocational Agriculture, available from Agricultural Education, South Dakota State University, Brookings, South Dakota.

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APPENDIX D

A sample four year program in Vocational Agriculture by major units and approximate time schedules.

	Ag. I	Hours	Ag. II.	Hours	Ag. III	Hours	Ag. IV	Hours
First	Orientation	5	Orientation	2	FFA	5	FFA	5
Nine	FFA	10	FFA	5	Soil and Water Management	40	Ag. Marketing	25
Weeks	Weed Identification and Control	20	Animal Nutrition	10			Farm Law	15
	Small Grain Production	30	Beef Production	30			Insurance	10
Second	Corn Production	30	Dairy Production	30	Farm Electricity	45	Farm Records and Income Tax	20
Nine			Sheep Production	10			Adv. Welding	20
Weeks							Ag. Construction	40
Third	Forages	20	Hog Production	10	Advanced Feeding	10		
Nine	Crop Judging	5	Supervised Ag. Occupations	10	Supervised Ag. Occupations	10	Supervised Ag. Occupations	10
Weeks	Supervised Ag. Occupations	10	Shop Safety and Orientation	3	Seed Certification	2		
	Ag. Mechanics Orientation	2	Arc Welding	15	Land Measurement	8		
	Tools	3	Oxyacetylene	15				
Fourth	Construction (wood)	20	Metals	15	Farm Power	45	Ag. Machinery and Hydraulics	30
Nine	Safe Tractor Driving Course	20	Tool Reconditioning	15				
Weeks	Final Review and Test	5	Final Review and Test	5	Final Review and Test	5	Final Review and Test	5

## APPENDIX E

A sample four year program in Vocational Agriculture by major units and approximate time schedule.

## FIRST SEMESTER

Week	Freshmen	Sophomores	Juniors	Seniors
	Ag. I	Ag. II	Ag. III	Ag. IV
1.	FFA-History and organization	FFA-Program of work	FFA-Committee assignments	FFA-Degrees and officer training
2.	Introduction to Parliamentary Procedure	Parliamentary Procedure	Parliamentary Procedure	Parliamentary Procedure
3.	Weed Identification	Livestock Feeds and Feeding	Land Judging Unit	Land Judging Unit
4.	Weed Identification	Feeds Unit	Land Judging Unit	Land Judging Unit
5.	Weed Control	Feeds Unit	Acquiring the Farm	Shop Safety Advanced Arc Welding Unit
6.	Shop Safety Intro. to Shop & Tool Identification	Swine Production	Planning the Farm Business	Advanced Arc Welding Unit
7.	Shop-Construct Wood working Joints	Swine Production	Shop Safety Individual Shop Projects	Oxy-acetylene Welding
8.	Construct Nailbox or Sawhorse	Swine Production	Individual Shop Projects	Oxy-acetylene welding
9.	Supervised Experience Record Book-Review & Tests	Supervised Experience Record Book-Review & Tests	Supervised Experience Record Book-Review & Tests	Supervised Experience Record Book-Review
10.	Nature and Importance of Plants	Introduction to Arc Welding	Shop-Work on Individual Shop Projects	Advanced Bills of Materials Problem

Week	Freshmen		Sophomores		Juniors		Seniors	
	Ag. I		Ag. II		Ag. III		Ag. IV	
11.	Growth and Reproduction of Plants		Introduction to Oxy-acetylene Welding		Individual Shop Projects		Building Materials Unit	
12.	Corn Production Unit		Beef Cattle Production		Farm Records		Rafter Cutting Using the Square	
13.	Corn Production Unit		Beef Cattle Production Cont'd.		Taxes, Insurance & Social Security		Adv. Principles of Carpentry	
14.	Small Grain Unit		Beef Cattle Production Cont'd.		Financing the Farm Business		Individual Shop Projects	
15.	Small Grain Unit		Principles of Animal Breeding		Contracts in Agriculture		Individual Shop Projects	
16.	Wood Identification		Principles of Animal Breeding		Management in Crop Production		Individual Shop Projects	
17.	Bills of Materials Demonstrations on Machine Use		Livestock Judging		Farm Law		Individual Shop Projects	
18.	Supervised Experience Record Book-Review & Tests		Supervised Experience Record Book-Review & Tests		Supervised Experience Record Book-Review & Tests		Supervised Experience Record Book-Review & Tests	
SECOND SEMESTER								
19.	FFA Speech Work		Shop Safety Individual Projects		Shop-Individual Projects		Farm Engine Unit	
20.	Introduction to Soils		Shop-Individual Projects		Shop-Individual Projects		Farm Engine Unit	
21.	Soils Unit		Shop-Individual Projects		Shop-Individual Projects		Farm Engine Unit	

Week	Freshmen		Sophomores		Juniors		Seniors	
	Ag. I	Fertilizers	Ag. II	Speech Work	Ag. III	Soils and Fertilizers	Ag. IV	Paints and Painting
22.	Soils Unit	Fertilizers	FFA Speech Work		Management of Soils and Fertilizers			
23.	Soil Testing & Sampling		FFA Speech Work		Management of Livestock Production		Cold Metal Unit	
24.	Shop-Individual Projects		Dairy Production		Management of Livestock Production		Shop-Individual Projects	
25.	Shop-Individual Projects		Dairy Production		Management of Dairy Production		Shop-Individual Projects	
26.	Shop-Individual Projects		Dairy Production		Management of Dairy Production		Shop-Individual Projects	
27.	Supervised Experience Record Book-Review & Tests		Supervised Experience Record Book-Review & Tests		Supervised Experience Record Book-Review & Tests		Supervised Experience Record Book-Review & Tests	
28.	Shop-Individual Projects		Shop-Individual Projects		Shop-Individual Projects		Hardware & Lumber Ident.	
29.	Shop-Individual Projects		Shop-Individual Projects		Shop-Individual Projects		Elective	
30.	Shop-Individual Projects		Sheep Production		Shop-Individual Projects		Elective	
31.	Crop Judging		Sheep Production		Ag. Chemicals		Electricity Unit	
32.	Crops Soybeans & Flax		Elective		Machinery Selection		Electricity Unit	
33.	Legumes Alfalfa & Sweetclover		Meats Judging		Building Selection		Electricity Unit	

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Week	Freshmen Ag. I	Sophomores Ag. II	Juniors Ag. III	Seniors Ag. IV.
34.	Red Clover, White Clover, Pastures	Poultry Production	Marketing	Farm Machinery Unit
35.	Annual, Biennial & Perennial Forage Grasses	Poultry Production	Elective	Farm Machinery Unit
36.	Supervised Experience Record Book-Review & Tests	Supervised Experience Record Book-Review & Tests	Supervised Experience Record Book-Review & Tests	Supervised Experience Record Book-Review & Tests

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## APPENDIX F

A sample four year program in Vocational Agriculture operating on a quarter course system in a two-man department.

Nine Week Periods

Daily Class Period	1st	2nd	3rd	4th
1.	Ag. Mech II (Project Construction) 11th Grade	Farm Building 11th Grade	Livestock and Meat Evaluation 11th Grade	Electricity (Residential and Rural) 11th Grade
2.	Soil Science 10th Grade	Small Engines 10th Grade	Crops II 10th Grade	Beef Production 10th Grade
3.	Range and Pasture Management 12th Grade	Farm Power 12th Grade	Farm and Range Management 12th Grade	Livestock Improvement 12th Grade
4.	Swine Production 10th Grade	Sheep Production 10th Grade		General Horticulture 10th or 11th Grade
5.	Introduction to Animal Science 9th, 10th, 11th, or 12th Grade	Small Engines 10th, 11th, or 12th Grade	Horse Production 11th or 12th Grade	Irrigation Systems 11th or 12th Grade
6.	Introduction to	Introduction to	Introduction to	Introduction to
7.	Vocational Agriculture 9th Grade	Animal Science 9th Grade	Crop Production 9th Grade	Ag. Mechanics 9th Grade