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)
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.
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.
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/Agri-
business 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 oppor-
tunities 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/Agricultural business 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.
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.


Approved March 13, 1969.
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 in-
structors. 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 in 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 under-
standing 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 responsi-
bility 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.
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.  
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


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


10. Guidelines for Evaluation of Local Programs of Vocational Agriculture--Assessment of Outcomes


<table>
<thead>
<tr>
<th>No.</th>
<th>Title</th>
<th>Author(s)/Publisher</th>
</tr>
</thead>
<tbody>
<tr>
<td>13.</td>
<td>Journal of Career Education, Department of Practical Arts and Vocational-Technical Education</td>
<td>University of Missouri-Columbia</td>
</tr>
<tr>
<td>16.</td>
<td>Locally Directed Evaluation of Local Vocational Education Programs, Byram and Robertson, Michigan State University</td>
<td></td>
</tr>
<tr>
<td>17.</td>
<td>Methods In Adult Education, Morgan, Holmes, and Bundy, The Interstate Printers and Publishers</td>
<td></td>
</tr>
<tr>
<td>18.</td>
<td>Multi District Secondary Vocational Education in South Dakota, South Dakota State Board of Vocational Education</td>
<td></td>
</tr>
<tr>
<td>19.</td>
<td>Multi District Time Allocation of Classroom Scheduling, Clarence Hall Vocational Agriculture Instructor</td>
<td>Watertown, South Dakota</td>
</tr>
<tr>
<td>20.</td>
<td>Occupational Information in Agriculture, Byram and Lambert, Michigan State University</td>
<td></td>
</tr>
<tr>
<td>22.</td>
<td>Planning Guide for Multi-District Secondary Occupational-Vocational Education in South Dakota, South Dakota State Board of Vocational Education</td>
<td></td>
</tr>
<tr>
<td>23.</td>
<td>Program Evaluation in Vocational and Technical Education, Denton, William T., Ohio State University</td>
<td></td>
</tr>
<tr>
<td>24.</td>
<td>Public Relations for Vocational Agriculture, Cardozier, V. R., Demeter Books</td>
<td></td>
</tr>
<tr>
<td>26.</td>
<td>Student Evaluation in Vocational and Technical Education, Denton, William T., Ohio State University</td>
<td></td>
</tr>
<tr>
<td>27.</td>
<td>Vocational Agriculture Department Evaluation (State Supervisor Form) Division of Vocational Education, Pierre, South Dakota</td>
<td></td>
</tr>
<tr>
<td>28.</td>
<td>Time Allocation Chart, Clarence Hall Vocational Agriculture Instructor</td>
<td>Watertown, South Dakota</td>
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</tbody>
</table>
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)
Farmerhand
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 Maintenance
Cattle Rancher

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

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
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.
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, Illinios Vo-Ag Service.
25. RAISING DAIRY CALVES, VAS 1021, 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.
<table>
<thead>
<tr>
<th>No.</th>
<th>Title</th>
<th>Author/Publisher</th>
</tr>
</thead>
<tbody>
<tr>
<td>39</td>
<td>HELP PREVENT MILK CONTAMINATION, CS 5</td>
<td>ISU Extension Service</td>
</tr>
<tr>
<td>40</td>
<td>THE NATIONAL COOPERATIVE DAIRYHERD IMPROVEMENT PROGRAM HANDBOOK</td>
<td>278, USDA</td>
</tr>
<tr>
<td>41</td>
<td>LOOSE HOUSING SYSTEM FOR DAIRY CATTLE, USDA</td>
<td></td>
</tr>
<tr>
<td>42</td>
<td>DAIRY EQUIPMENT PLANS, MWPS 7, Midwest Plan Service</td>
<td></td>
</tr>
<tr>
<td>43</td>
<td>QUALITY MILK PRODUCTION, Pennsylvania State University</td>
<td></td>
</tr>
<tr>
<td>44</td>
<td>ADVANCED LIVESTOCK PRODUCTION UNIT FOR DAIRY, Instructional Materials Laboratory, University of Missouri.</td>
<td></td>
</tr>
<tr>
<td>45</td>
<td>FACT SHEETS: CONDENSED REVIEWS, National Pork Producers Council</td>
<td></td>
</tr>
<tr>
<td>46</td>
<td>LIFE CYCLE SWINE NUTRITION, PM 489</td>
<td>ISU Extension Service</td>
</tr>
<tr>
<td>47</td>
<td>HOG MANAGEMENT CALENDAR, Dec, 1972</td>
<td>Wallace's Farmer</td>
</tr>
<tr>
<td>48</td>
<td>NUTRITIONAL REQUIREMENTS OF SWINE, No. 2</td>
<td>National Academy of Science</td>
</tr>
<tr>
<td>49</td>
<td>MEETING AMINO ACID NEEDS OF GROWING AND FINISHING SWINE, FS 1332</td>
<td>ISU Extension Service</td>
</tr>
<tr>
<td>50</td>
<td>GENETIC IMPROVEMENT THROUGH SWINE SELECTION, University of Minnesota</td>
<td></td>
</tr>
<tr>
<td>51</td>
<td>PORK PRODUCERS' DAY, (Most current)</td>
<td>ISU Extension Service</td>
</tr>
<tr>
<td>52</td>
<td>SWINE-WITHDRAWAL TIME FOR FEED ADDITIVES, INJECTABLE ANTIBIOTICS, AND PESTICIDES, PM 508, ISU Extension Service</td>
<td></td>
</tr>
<tr>
<td>53</td>
<td>PERFORMANCE PROVEN PUREBREDS, PM 515</td>
<td>ISU Extension Service</td>
</tr>
<tr>
<td>54</td>
<td>SWINE HOUSING AND EQUIPMENT, MWPS 8</td>
<td>Midwest Plan Service</td>
</tr>
<tr>
<td>55</td>
<td>HOG LOT EQUIPMENT, F 2192</td>
<td>USDA</td>
</tr>
<tr>
<td>56</td>
<td>SWINE PRODUCTION GUIDE, Land 0' Lakes Felco</td>
<td></td>
</tr>
<tr>
<td>57</td>
<td>CARE AND MANAGEMENT OF THE SOW HERD, AS 311</td>
<td>Agricultural Publications, Purdue</td>
</tr>
<tr>
<td>58</td>
<td>CARE FOR THE SOW AND LITTER AT FARROWING TIME, VAS 1037</td>
<td>Illinois Vo-Ag Service</td>
</tr>
<tr>
<td>59</td>
<td>CARING FOR THE SWINE HERD DURING BREEDING AND GESTATION, VAS 1034</td>
<td>Illinois Vo-Ag Service</td>
</tr>
<tr>
<td>60</td>
<td>DISEASES AFFECTING SWINE REPRODUCTION, VY 17</td>
<td>Agricultural Publications, Purdue</td>
</tr>
<tr>
<td>61</td>
<td>EVALUATION OF SWINE CARCASSES, AS 356</td>
<td>Agricultural Publications, Purdue</td>
</tr>
<tr>
<td>62</td>
<td>HOG SELECTION AND CULLING, AS 312</td>
<td>Agricultural Publications, Purdue</td>
</tr>
<tr>
<td>63</td>
<td>THE SWINE ENTERPRISE, VAS 1029</td>
<td>Illinois Vo-Ag Service</td>
</tr>
<tr>
<td>64</td>
<td>SWINE INFORMATION SERVICE, (numerous titles of specific pamphlets), National Hog Farmer</td>
<td></td>
</tr>
<tr>
<td>65</td>
<td>SWINE NUTRITION, 536, 537</td>
<td>Michigan Extension Service</td>
</tr>
<tr>
<td>66</td>
<td>MANAGING THE BEEF BREEDING HERD, VAS 1010a</td>
<td>Illinois Vo-Ag Service</td>
</tr>
<tr>
<td>67</td>
<td>BUYING AND FEEDING BEEF CATTLE, VAS 1012</td>
<td>Illinois Vo-Ag Service</td>
</tr>
<tr>
<td>68</td>
<td>ARTIFICALLY INSEMINATING, VAS 1002b</td>
<td>Illinois Vo-Ag Service</td>
</tr>
<tr>
<td>69</td>
<td>FINISHING BEEF CATTLE, 2196</td>
<td>USDA</td>
</tr>
<tr>
<td>70</td>
<td>CATTLE FEEDING, 449</td>
<td>Ohio Extension Service</td>
</tr>
<tr>
<td>71</td>
<td>BEEF CATTLE: DEHORNING, CASTRATING, BRANDING, AND MARKING, F 2141</td>
<td>USDA</td>
</tr>
<tr>
<td>72</td>
<td>BEEF CATTLE IMPROVEMENT, AH 299</td>
<td>USDA</td>
</tr>
<tr>
<td>73</td>
<td>BEEF CATTLE CORRALS, M 1044</td>
<td>USDA</td>
</tr>
</tbody>
</table>
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. BEEF COW MANAGEMENT CALENDAR, AS 373, ISU Extension Service.
82. "AGE" CATTLE BY THEIR TEETH, FS 1095, ISU Extension Service.
83. BEEF OUTLOOK, FS 1255, ISU Extension Service.
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85. HANDLING AND FEEDING NEW FEEDER CATTLE, PM 401, ISU Extension Service.
86. INCOME OPPORTUNITIES FOR IOWANS, PM 487, ISU Extension Service.
87. BEEF PRODUCTION GUIDE, Land O' Lakes Felco.
88. BEEF COW MANAGEMENT CALENDAR, AS 373, ISU Extension Service.
89. HANDLING AND FEEDING NEW FEEDER CATTLE, PM 401, ISU Extension Service.
90. INCOME OPPORTUNITIES FOR IOWANS, PM 487, ISU Extension Service.
91. BEEF COW MANAGEMENT CALENDAR, AS 373, ISU Extension Service.
92. "AGE" CATTLE BY THEIR TEETH, FS 1095, ISU Extension Service.
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94. THE BEEF COW-CALF HERD IN IOWA, PM 400, ISU Extension Service.
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98. "AGE" CATTLE BY THEIR TEETH, FS 1095, ISU Extension Service.
99. BEEF OUTLOOK, FS 1255, ISU Extension Service.
100. THE BEEF COW-CALF HERD IN IOWA, PM 400, ISU Extension Service.
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.
5. ANIMAL NUTRITION, Maynard and Loosli; McGraw-Hill Book Company.
6. FEEDS AND FEEDING, Morrison; Morrison Press.
7. PHYSIOLOGY OF LACTATION, Smith; ISU Press.
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.
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.
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.
27. SWINE PRODUCTION, Carroll, Krider, and Andrews; McGraw-Hill Book Company.
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

   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

    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

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
### 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.

<table>
<thead>
<tr>
<th>Cash Grain Farmer</th>
<th>Fieldman, Food Processing Company</th>
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</thead>
<tbody>
<tr>
<td>Custom Farm Operator</td>
<td>Packing Shed Foreman</td>
</tr>
<tr>
<td>Experimental Farm Manager</td>
<td>Grain Inspector</td>
</tr>
<tr>
<td>Certified Seed Producer</td>
<td>Seed Inspector</td>
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<tr>
<td>Fertilizer or Lime Applicator</td>
<td>Research Technician</td>
</tr>
<tr>
<td>Spray Equipment Operator</td>
<td>Weed Control Assistant</td>
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<tr>
<td>Harvesting Supervisor</td>
<td>Seed Production Manager</td>
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<tr>
<td>Pilot - Pest Control Applicator</td>
<td>Weed Inspector</td>
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<tr>
<td>Farmhand</td>
<td>Truck Driver - Grain and Supplies</td>
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<tr>
<td>Farm Loan Assistant</td>
<td>Feed Mill Employee</td>
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<tr>
<td>Farm Record Specialist</td>
<td>Elevator Manager</td>
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<tr>
<td>Farm Manager</td>
<td>Elevator Employee</td>
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<tr>
<td>Abstractor</td>
<td>Certified Seed Field Inspector</td>
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<tr>
<td>Hail Insurance Adjustor</td>
<td>Farm Machinery Dealer</td>
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<tr>
<td>Farm Realtor</td>
<td>Farm Machinery Salesman or Mechanic</td>
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<tr>
<td>PCA Manager</td>
<td>Farm Equipment Fabricator</td>
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<tr>
<td>Farm Supply Salesman</td>
<td>Farm Equipment Research Technician</td>
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<tr>
<td>Grain Buyer</td>
<td>Agricultural Engineer</td>
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<tr>
<td>Hay and Forage Buyer</td>
<td>Farm Machinery Company District Manager</td>
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<tr>
<td>Produce Department Manager</td>
<td>Grain Dryer Operator</td>
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<tr>
<td>Chemical Salesman or Fieldman</td>
<td>Soil Conservation Aide (Technician)</td>
</tr>
<tr>
<td>Grain Products Salesman</td>
<td>Pilot-Soil Mapping</td>
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<tr>
<td>Farm Fuel Supplier</td>
<td>Soil Conservationist</td>
</tr>
<tr>
<td>Food Processing Company Employee</td>
<td>Soil Scientist</td>
</tr>
<tr>
<td>Fertilizer Dealer or Fieldman</td>
<td>Park Naturalist</td>
</tr>
<tr>
<td>Fertilizer Plant Employee</td>
<td>Park Employee</td>
</tr>
</tbody>
</table>
Advertising Firm Manager
Market Research Analyst
Extension Director
Extension Crops or Soils Specialist
Pathologist
Entomologist
Botanist
Vocational Agriculture Instructor
Agricultural Journalist
Agricultural Broadcaster
Auctioneer
Commodity Broker
Seed Processing Foreman

Drainage Contractor
Soil Mapper
Soil Test Lab Employee
Wildlife Conservation Officer
College Professor
Peace Corps Volunteer
County Assessor
Plant Breeder
Agricultural Missionary
Farm Newspaper Editor
Foreign Agricultural Service Employee
Agricultural Economist

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:

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.
10. COUNTY PLAT BOOK, local courthouse.
11. AGRICULTURAL STATISTICAL REVIEW, USDA.
12. AGRICULTURAL STATISTICS, 1972, USDA.
14. IOWA FARM OUTLOOK, ISU Extension.
15. DEFINING SOILS AND WATERSHEDS, Conservation Aide II, 1972, Ohio State.
16. UNDERSTANDING SOILS, 1972, #4052, Illinois VAS.
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.
27. WEATHER MANAGEMENT, 1969, Successful Farming.
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 Extension.
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.
108. APPROVED PRACTICES FOR SOYBEANS, Illinois VAS.
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.
117. APPROVED PRACTICES FOR ALFALFA, 1972, Illinois VAS.
118. APPROVED PRACTICES IN FORAGE CROPS, Vol. 13, No. 98, 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.
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.
Books:

1. AN INTRODUCTION TO AGRICULTURAL BUSINESS AND INDUSTRY, Weyant, Hoover and McClay, Interstate Printers.
3. CAREERS UNLIMITED, Future Farmer Supply.
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.
9. SCIENCE FOR BETTER LIVING, Yearbook of Agriculture 1968, USDA.
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.
22. MIDWEST FARM PLANNING MANUAL, ISU Press.
23. MIDWEST FARM HANDBOOK, ISU Press.
24. INTRODUCTORY SOILS, Berger, Macmillan Co.
26. INSTRUCTIONAL MATERIALS FOR PRODUCTION AGRICULTURE FOR VOC AG I, II, III, AND IV, Texas A & M.
27. SEEDS, Yearbook of Agriculture 1961, USDA.
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.
42. DYNAMICS OF LAND USE, NEEDED ADJUSTMENT, 1964, ISU Press.
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  85/21

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

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 Dairymen
   Fort Atkinson, Wisconsin 53538

   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
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.
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, September 1972; University of Illinois.
47. TEACHING UNITS IN LEGAL ASPECTS OF FARM BUSINESS MANAGEMENT, Purdue University.
48. USING FARM REAL ESTATE LOANS, 2033; Illinois Vo-Ag Service.

Books:

1. AN INTRODUCTION TO AGRICULTURAL BUSINESS AND INDUSTRY, Weyant, Hoover, and McClay 1971; Interstate.
2. HANDBOOK OF AGRICULTURAL OCCUPATIONS, Hoover, 1969; 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.
12. FARM POWER AND MACHINERY MANAGEMENT, Hunt, Sixth Edition; Iowa State University.
14. EXPERIENCE PROGRAMS FOR LEARNING VOCATIONS IN AGRICULTURE, Binkley and Hammonds, 1970; Interstate.

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.
   3900 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  

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  
Ithica, 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

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 Production Manager
Farm Supply Sales Manager
Farm Supply Service Manager
Farm Supply Office Manager
Farm Supply Company Research and Development Director
Farm Supply Company Fieldman
Farm Supply Center Bookkeeper
Farm Supply Salesman
Farm Supply Serviceman
Farm Supply Applicator
Farm Supply Equipment Operator
Farm Supply Warehouseman
Farm Supply Center Deliveryman
Farm Supply Center Sales Clerk
Farm Supply Center Stock Clerk
Feed Mill Employee
Petroleum and Related Products Route Salesman
Agricultural Chemical Fieldman

Farm Supply Center Worker
Parts Man
Grain Elevator Man
Grain Grader
Grain Inspector
Feed Specialist
Seed Technician
Animal Health Supply Salesman
Veterinarian's Assistant
Pest Exterminator
Pest Exterminator Supervisor
Weed Inspector
Grain Hauling Contractor
Grain Hauler
Custom Pesticide Applicator
Farm Supply Order Clerk
Farm Supply District Salesman
Pet Center Sales Clerk
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. Record.
      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. SALESMAIHSHIPS 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 BUSHELS 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

Books:

1. ESSENTIAL ASPECTS OF CAREER PLANNING AND DEVELOPMENT, Atherton and Humphrey, 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 Tonning, 1965; Prentice-Hall, Inc.
12. CREATIVE SELLING, Johnson; Southwestern Publishing Company.
13. STORE SALESMANSHIP, Robinson and others, Prentice-Hall.
15. MATHEMATICS SKILL BUILDER, Gossage and Briggs, Third 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.
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.
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 Manufactures
   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

    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
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.

<table>
<thead>
<tr>
<th>Professional</th>
<th>Skilled</th>
</tr>
</thead>
<tbody>
<tr>
<td>Research Engineer</td>
<td>Mechanic</td>
</tr>
<tr>
<td>Plant-Research Engineer</td>
<td>Partsman</td>
</tr>
<tr>
<td>Field-Research Engineer</td>
<td>Welder</td>
</tr>
<tr>
<td>Plant-Production Engineer</td>
<td>Machinist</td>
</tr>
<tr>
<td>Research Draftsman</td>
<td>Bodyman</td>
</tr>
<tr>
<td></td>
<td>Mechanic and Truck Driver</td>
</tr>
</tbody>
</table>
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.
7. PAINTS AND PAINTING, No. AED-13, MWPS.
8. INSULATION AND HEAT LOSS, AED-13, MWPS.
Concrete and Concrete Masonry

5. AGRIBUSINESS MASONRY, (Speciaized 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.
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.

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.
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.
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.
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.
1. LINCOLN ELECTRIC WELDING GUIDE, Booklet, 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.

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

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

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 Wyandotte 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
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

3-5
Fieldman
Grain Buyer
Grain Grader
Grain Processing Employee
Grain Mixer
Grain Elevator Employee
Inspector
Maintenance Man
Manager Grain Elevator
Market Research Analyst
Mill Operator
Quality Control Officer
Salesman
Scale Operator
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

   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

   600 Crandall Building  
   Salt Lake City, Utah  84101

   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
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 Marker 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
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.
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.
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.
20. HOW TO USE A CHAIN SAW, McCulloch Motor Company.
21. LANDSCAPING, Department of Public Instruction; Indianapolis, Indiana.
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 OPERATIONS AND MANAGEMENT, Penn State University.
44. SHRUB IDENTIFICATION BOOK, Symonds; Barrows & Company.
45. SHRUBS FOR LANDSCAPING, IDENTIFICATION, CULTIVATION, 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.

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. McCullock 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 Nurseriesmen
    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

    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
   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 50316

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

    100 Morrill Hall
    North Dakota State University
    Fargo, North Dakota 58102

40. Ohio Agricultural Education
    Curriculum Materials Service
    2120 Fyffe Road
    Columbus, Ohio 43210
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.

<table>
<thead>
<tr>
<th>Air Resource Management</th>
<th>Land Use Planning</th>
</tr>
</thead>
<tbody>
<tr>
<td>Air Pollution Control Worker</td>
<td>Surveyor's Assistant-Rodman</td>
</tr>
<tr>
<td>Air Monitoring Technician</td>
<td>Surveyor's Assistant-Chainman</td>
</tr>
<tr>
<td>Smoke Tester</td>
<td>Surveyor</td>
</tr>
<tr>
<td>Air Analyst</td>
<td>City Planning Aide</td>
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<tr>
<td>Compliance Section Technician</td>
<td>Urban Planning Technician</td>
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<tr>
<td>Engineering Section Technician</td>
<td>Zoning Inspector</td>
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<td>Air Pollution Control Supervisor</td>
<td>Zoning Technician</td>
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<td>Air Pollution Control Meteorologist</td>
<td>Chief Planning Officer</td>
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<td>Air Pollution Control Chemist</td>
<td>City Planning Engineer</td>
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<td>Air Pollution Control Engineer</td>
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<td>Fish Management</td>
<td>Regional Planner</td>
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<td>Fish Hatchery Worker</td>
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<td>Fish Farmer</td>
<td>Architectural Engineer</td>
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<td>Conservation Patrolman</td>
<td>Mining Area Restoration Worker</td>
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<td>Fish Culturist</td>
<td>Mining Area Restoration Technician</td>
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<td>Fisheries Scientist</td>
<td>Open Pit Mine Conservation Inspector</td>
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<tr>
<td>Fish Hatchery Superintendent</td>
<td>Mineralogist</td>
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<td>Fisheries Technician</td>
<td>Geologist</td>
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<td>Fishery Technician</td>
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<td>Fishery Biologist</td>
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<td>Fishery Manager</td>
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<table>
<thead>
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<th>Forest Resource Management</th>
<th>Outdoor Recreation Planning</th>
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<tr>
<td>Tree Planter</td>
<td>Grounds Keeper</td>
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<td>Forestry Aide</td>
<td>Parks Caretaker</td>
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<td>Tree Farmer</td>
<td>Parks Worker</td>
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<td>Forest Technician</td>
<td>Recreation Farm Manager</td>
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<td>Wood Supervisor</td>
<td>Dude Ranch Manager</td>
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<td>Forest Nursery Technician</td>
<td>Hunting and Fishing Guide</td>
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<td>Forest Cruiser</td>
<td>Recreational Development Technician</td>
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<td>Forest Warden</td>
<td>Fish and Game Club Manager</td>
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<td>Forester</td>
<td>Ski Patrolman</td>
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<td>Forest Entomologist</td>
<td>Winter Sports Manager</td>
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<td>Consulting Forester</td>
<td>Guest Farm Manager</td>
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<td>Forest Examiner</td>
<td>Parks Foreman</td>
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<td>Forest Supervisor</td>
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<td>Parks Superintendent</td>
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<td>Parks Ranger</td>
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<td>Campground Caretaker</td>
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<td></td>
<td>Camp Counselor</td>
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</table>
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
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.
10. RESOURCE CONSERVATION IN IOWA; S.C.S.
12. CAREERS IN WILDLIFE CONSERVATION; C6. Cornell University.
13. CONSERVATION ACTION HANDBOOK; C7. Cornell University.
18. ENVIRONMENTAL HEALTH AND POLLUTION CONTROL; PM486. I.S.U. Publications.
19. PLANNING A CAREER IN FISH & WILDLIFE MANAGEMENT; State Conservation Commission.
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.

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.
8. THE AIR WE LIVE IN; 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; Lipinan. University of Illinois.
2. IOWA ORNITHOLOGIST UNION FIELD CHECK LIST; Iowa Ornithologist Union.
8. FISHERIES AS A PROFESSION; American Fisheries Society.

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.
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.
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.

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.
4. SWINE WASTE MANAGEMENT - folder; I.S.U. Department of Agricultural Education.

Outdoor Recreation Planning

1. RECREATION IN SMALL WATERSHED PROJECTS; PA610. U.S. Soil Conservation Service.
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.
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.
15. OUTDOOR LIVING: PLANNING & CONSTRUCTION GUIDE; Cornell University.

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.
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.

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. UPGRAADING 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 TO ABOUT WATER POLLUTION; U.S.D.I.
13. SOME ASPECTS OF WATER RESOURCE DEVELOPMENT; Cl. Cornell University.

Wildlife Management

1. ENDANGERED SPECIES; National Wildlife Federation.
2. PRINCIPLES OF GAME MANAGEMENT; C26. Cornell University.
8. AUTUMN OLIVE FOR WILDLIFE & OTHER CONSERVATION USES; U.S.D.A. Superintendent of Documents.
10. WILDLIFE OF STREAMS, LAKES & RIVERS; National Wildlife Federation.
11. WILDLIFE OF FARM & FIELD; National Wildlife Federation.
12. THE FARMER & WILDLIFE; Wildlife Management Institute.
15. IOWA BIRD MIGRATION CALENDAR; WL32. I.S.U. Publications.
17. IT'S FAWNING TIME AGAIN; FS9657. I.S.U. Publications.
19. SIGNS OF GOOD HUNTING & FISHING; Program Aid 1012. S.C.S.
20. A PEEK AT WILDLIFE; State Conservation Commission.
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.
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.
7. ENVIRONMENT CONSERVATION; Dasman. John Wiley & Son, Son.
8. EROSION & SEDIMENT POLLUTION CONTROL; Beasley. I.S.U. Press.
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.
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.
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.
27. CONSERVATION TOOLS FOR EDUCATION; Conservation Education Office.
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.
35. ELEMENTS OF OUTDOOR RECREATION PLANNING; Driver. School of Natural Resources, University of Michigan.
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 Institute 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

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 Wildlife
Science Building
Ames, Iowa 50010
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. Martin's 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

    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. ADVISING AND PROMOTION, Student Manual, Ohio Agricultural Education Curriculum Materials Service.
3. AGRICULTURAL BUSINESS PROCEDURES, Illinois Vo-Ag Service, (40¢)
5. AGRICULTURE, MORE THAN FARMING, CAREERS UNLIMITED, Future Farmers Supply 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 AGRIDUSINESS, 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.
18. CATALOG OF LITERATURE, Aluminum Company of America.
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.
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.
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.
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.
48. PLANNING FOR A CAREER IN AGRICULTURE, Student Handbook, 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. SALESMAHSHIP IN AGRICULTURAL BUSINESS, Illinois Vo-Ag Service.
56. SAVINGS AND CHECKING ACCOUNTS, Ohio Agricultural Education Curriculum Materials Services. (30c)
57. SELLING AND SALESMAHSHIP, Student Manual, Ohio Agricultural Education Curriculum Materials Services.
59. SHOULD YOU GO INTO AGRICULTURE, New York Life Insurance Company.
60. SIMPLIFYING WORK IN AN AGRICULTURAL BUSINESS, Illinois Vo-Ag Service. (35c)
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. (30c)
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. (10c)

Books:

1. THE ART AND SKILL OF GETTING ALONG WITH PEOPLE, Duvall, Sylvanus M., Prentice-Hall, Inc.
7. HOW TO WIN FRIENDS AND INFLUENCE PEOPLE, Carnegie, Dale, Pocket Books, Inc.

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 Pyffe Road  
   Columbus, Ohio 43210
<table>
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<tr>
<th>Number</th>
<th>Company/Institution</th>
<th>Address</th>
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<tr>
<td>25.</td>
<td>Pennsylvania State University</td>
<td>Department of Agricultural Education</td>
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<td>University Park, Pennsylvania 16802</td>
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<td>26.</td>
<td>Pocket Books, Inc.</td>
<td>1 West 39th Street</td>
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<td>New York, New York 10018</td>
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<td>27.</td>
<td>Prentice-Hall, Inc.</td>
<td>Education Division</td>
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<td>Englewood Cliffs, New Jersey</td>
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<td>28.</td>
<td>Ralston-Purina Company</td>
<td>St. Louis, Missouri 63199</td>
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<td>29.</td>
<td>Small Business Administration</td>
<td>New Federal Building</td>
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<td>210 Walnut Street</td>
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<td>Des Moines, Iowa 50309</td>
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<td>Toastmasters International</td>
<td>P.O. Box 10400</td>
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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
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. Ornamental 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:

4. HOW TO HOLD A BETTER MEETING, Frank Snell, Harper and Brothers, New York, New York.
7. I DARE YOU, Danforth, Ralston Pruina, St. Louis, Missouri.
11. PRACTICAL PARLIAMENTARY PROCEDURE, R. M. Cruzan, McKnight and McKnight, Bloomington, Illinois.
Manuals or Magazines:

1. AGRIOPPORTUNITIES, National FFA Center, Alexandria, Virginia 22309.
3. BOAC COMMUNITY ACTION PROGRAM BOOKLET, National FFA Center, Alexandria, Virginia 22309.
6. NATIONAL FFA CHAPTER SAFETY AWARD HANDBOOK, National FFA Center, Alexandria, Virginia 22309.
8. NATIONAL CONVENTION PROCEEDINGS, National Executive Secretary, 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.

Pamphlets or Leaflets:

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:

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. Acoustically 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 similar 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 carrels 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
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**

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### Agricultural Supplies Business and Service Related Class Units

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<td>The Greenhouse Worker</td>
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<td>The Nursery Worker; Part I, Part II</td>
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### Instructional and Office Equipment

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### Filmstrips and Slides

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<td>Salesmanship in Agribusiness</td>
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<td>Careers in Farm Services</td>
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<td>Careers in Farm Supplies</td>
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<td>Tractor Maintenance (8 films)</td>
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<td>Calibrating Field Sprayers</td>
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<tr>
<td>Calibrating a Granular Applicator</td>
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<tr>
<td>Electrical Terms -- Their Meaning and Use</td>
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<tr>
<td>How Farm Electrical Motors Start and Run</td>
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<td>Learning Arc Welding Skills</td>
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<tr>
<td>Planting Corn</td>
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<td>Recognizing Herbicide Injury</td>
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<td>Judging Beef Cattle</td>
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<td>Let's Make Concrete</td>
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<tr>
<td>Breeds of Dairy Cattle</td>
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<td>Fundamentals of Dairy Cattle Judging</td>
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<td>Starting to Keep Records</td>
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<td>Pruning Orchard Trees</td>
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<td>Preventing Transportation Losses of Livestock</td>
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<td>Parliamentary Procedure in Action</td>
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<td>Steps to a Better Lawn</td>
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<td>Safe Use of Pesticides on the Farm</td>
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<td>Selecting Breeding Sheep</td>
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<td>Judging Sheep</td>
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<td>Swine Carcass Evaluation</td>
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<td>Identification of Weeds (Part I &amp; II)</td>
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<td>Plan the Livestock System and Estimate Fertility Costs</td>
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<td>Factors Affecting Classes and Grades of Wheat Diseases of Soybeans</td>
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<td>Product Competition Product Knowledge</td>
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<td>A Market For Your Product Displaying Merchandise</td>
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<table>
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<td>Judging Poultry, live and dressed Life Cycle of Round Worm of Swine How to Take a Soil Sample Fertilizers a Paying Investment Agriculture and Your Environment Battery Ignition Systems Carburetor Reading the Micrometer Torque and Torque Wrenches Truss Rafter Layout Fertilize Those Soybeans Alfalfa for Top Profits Soil and Its Properties</td>
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</table>

Grand Total $4129.15

Additional teaching materials would include agricultural magazines, commercial publications, and college publications.
FOOTNOTES - SOURCES OF TEACHING MATERIALS

1 Supplies available from Nacso, Ft. Atkinson, Wisconsin. Prices are from 1974-75, catalog #125

2 Available from Plant Science Department at SDSU, Brookings, South Dakota 57006

3 Successful Farming Magazine, Des Moines, Iowa, also from source #1

4 Hobar Publications, 1305 Tiller Lane; St. Paul, Minnesota 55112

5 Deere and Company, Distribution Service Center - Department S/P 1400 3rd Avenue, Moline, Illinois 61265

6 Ag Engineering Department, SDSU, Brookings, South Dakota 57006

7 Interstate Printers and Publishers, Inc., Danville, Illinois

8 Farm Credit Banks of Omaha
   Box 1229
   Omaha, Nebraska 68101

9 Iowa State University Press, Ames, Iowa 50010

10 Prentice-Hall, Englewood Cliffs, New Jersey 07632

11 State Department of Voc. and Tech. Ed., Curriculum and Instructional Materials Center, 1515 West Sixth Avenue, Stillwater, Oklahoma 74074

12 Ohio Agricultural Education, Curriculum Materials Service, Room 254, 2120 Fyffe Road, Columbus, Ohio 43210

13 Minnesota Vocational Materials Center
   Staple Area Vo-Tech Institute
   Staples, Minnesota 56479

14 The Fertilizer Institute, 1015 18th Street, N.W., Washington, D.C. 20036

15 Vocational Agriculture Service, 434 Mumford Hall, Urbana, Illinois 61801

16 Potash Institute of North America, 1649 Tillie Circle, N.E., Atlanta, Georgia 30329
**Vocational Agriculture Ag Mechanics Equipment**

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<td>3' ripping bar</td>
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<tr>
<td>2' ripping bar</td>
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<tr>
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<td>strap type battery carrier</td>
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<td>set of 13 wood auger bits</td>
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<td>countersink, (1/2&quot; and 3/4&quot;)</td>
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<td>set of 29 high speed twist drills</td>
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<tr>
<td>assorted phillips and standard screwdrivers</td>
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<td>braces, 10&quot; sweep</td>
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<td>oil cans, Squirt</td>
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<td>assorted cold chisels</td>
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<td>&quot;C&quot; clamps</td>
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<tr>
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<td>screw extractor set</td>
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<td>flaring tool</td>
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<td>elec. bench grinder (6&quot;)</td>
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<tr>
<td>3/8&quot; hand groover, sheet metal</td>
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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.
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<td>Hatchet</td>
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<td>arc welding helmets</td>
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**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

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<th>Unit Price</th>
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**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.


D. Guidelines for Evaluation of Local Programs of Vocational Agriculture, available from Agricultural Education, South Dakota State University, Brookings, South Dakota.
A sample four year program in Vocational Agriculture by major units and approximate time schedules.

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APPENDIX E

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

**FIRST SEMESTER**

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<th>Juniors Ag. III</th>
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<td>FFA-History and organization</td>
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<td>Shop Safety Intro. to Shop &amp; Tool Identification</td>
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<td>Shop-Construct Woodworking Joints</td>
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<td>Management of Soils and Fertilizers</td>
<td>Paints and Painting</td>
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<td>23.</td>
<td>Soil Testing &amp; Sampling</td>
<td>FFA Speech Work</td>
<td>Management of Livestock Production</td>
<td>Cold Metal Unit</td>
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<td>29.</td>
<td>Shop-Individual Projects</td>
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<td>Shop-Individual Projects</td>
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</tr>
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<td>Sheep Production</td>
<td>Ag. Chemicals</td>
<td>Electricity Unit</td>
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<tr>
<td>32.</td>
<td>Crops Soybeans &amp; Flax</td>
<td>Elective</td>
<td>Machinery Selection</td>
<td>Electricity Unit</td>
</tr>
<tr>
<td>33.</td>
<td>Legumes Alfalfa &amp; Sweetclover</td>
<td>Meats Judging</td>
<td>Building Selection</td>
<td>Electricity Unit</td>
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<td>Week</td>
<td>Freshmen</td>
<td>Sophomores</td>
<td>Juniors</td>
<td>Seniors</td>
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<td>Ag. I</td>
<td>Ag. II</td>
<td>Ag. III</td>
<td>Ag. IV.</td>
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<td>34.</td>
<td>Red Clover, White Clover, Pastures</td>
<td>Poultry Production</td>
<td>Marketing</td>
<td>Farm Machinery Unit</td>
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<td>Annual, Biennial &amp; Perennial Forage Grasses</td>
<td>Poultry Production</td>
<td>Elective</td>
<td>Farm Machinery Unit</td>
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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**

<table>
<thead>
<tr>
<th>Daily Class</th>
<th>1st</th>
<th>2nd</th>
<th>3rd</th>
<th>4th</th>
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<tr>
<td><strong>1.</strong></td>
<td>Ag. Mech II</td>
<td>Farm Building</td>
<td>Livestock and Meat</td>
<td>Electricity</td>
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<tr>
<td></td>
<td>(Project Construction)</td>
<td>11th Grade</td>
<td>Evaluation</td>
<td>(Residential and Rural)</td>
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<td><strong>2.</strong></td>
<td>Soil Science</td>
<td>Small Engines</td>
<td>Crops II</td>
<td>Beef Production</td>
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<td>Range and Pasture</td>
<td>Farm Power</td>
<td>Farm and Range</td>
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<td>Management</td>
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<td>Introduction to Animal</td>
<td>Small Engines</td>
<td>Horse Production</td>
<td>Irrigation Systems</td>
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<td>Science</td>
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<td>11th or 12th Grade</td>
<td>11th or 12th Grade</td>
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<tr>
<td></td>
<td>9th, 10th, 11th, or</td>
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<tr>
<td></td>
<td>12th Grade</td>
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<td><strong>6.</strong></td>
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<td>Introduction</td>
<td>Introduction</td>
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<td>Crop Production</td>
<td>Ag. Mechanics</td>
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