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## ABSTRACT

This basic instructional guide for an agricultural production program is one in a series of such guides for agricultural education. It is useful in developing and selecting instructional material and implementing competency-based education for a program directed toward helping students to become proficient in animal, plant, and soil sciences and in farm business management and agricultural mechanics. Introductory materials include a listing of related Dictionary of Occupational Titles job titles, overview of the program, and description of the program. Course descriptions and content outlines are then provided for each of the three courses in this program: agricultural production technology III, agricultural production management IV, and operating the farm business V. A content outline is also presented for livestock production. These competencies may be integrated into the instructional sequence for agricultural production III, IV, and V according to student needs. Appendixes include a tool and equipment list, resources for livestock production, resources for agricultural production, and recommended facility plans and inclusions. (YLB)

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# **AGRICULTURAL PRODUCTION**

## **An Administrative Guide for Agricultural Education**

**Prepared by**

**Virginia Vocational Curriculum and Resource Center  
Henrico County Public Schools  
Department of Vocational and Community Education  
Glen Allen, Virginia 23060**

**In cooperation with**

**Agricultural Education Service  
Virginia Department of Education  
Division of Vocational Program Services  
Richmond, Virginia 23216**

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**1988**

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The contents of this administrative guide were extracted from the Task Analyses for Livestock Production and the Task Analyses for Agricultural Production.

The Task Analyses for Livestock Production was based on an instructional resource guide developed by Claude A. Morris, Vocational Agriculture Instructor, and Jodi Maxey, Horticulture Instructor, Prince Edward County High School, under the direction of Leon A. Morton, Director of Vocational Education, Prince Edward County; and John D. Miller Jr., Vocational Guidance Counselor, Prince Edward County High School.

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## INTRODUCTION

The course content in this document is extracted from the Task Analyses for Agricultural Production and Task Analyses for Livestock Production. These publications contain curriculum materials applicable to the entire state; therefore, localities should select the instructional areas appropriate for their respective communities. No one agricultural education department will be able to offer all of the material outlined in this document. Other instructional areas should not have to be added, but unit plans and lesson plans developed by individual teachers may require additional competency-based performance objectives and criterion-referenced measures.

The curriculum for agricultural production is based on the assumption that students who enroll in the course have completed Agricultural Mechanics and Basic Plant Science and Agricultural Mechanics and Basic Animal Science. The major emphasis in agricultural production is directed toward helping students to become proficient in animal, plant, and soil sciences, and in farm business management and agricultural mechanics.

Individuals engage in agricultural production at different levels of employment, including owner-operator, manager, tenant, technician, and laborer. Because knowledge and skills required at different levels of employment vary, educational programs designed to prepare and upgrade individual workers also must vary in length and level of instruction.

Since the first courses were offered in agricultural education in high school, major emphasis has been placed on agricultural production. The course content was determined primarily by the problems of the small family farm unit. During the past half century, however, major changes have occurred in farming. Mechanical power has replaced animal power. Scientific developments have had far-reaching effects on soils, fertilizer, and plant and animal life. Cross breeding, hybridization, synthetics, vitamins, antibiotics, miracle drugs, pesticides, chemicals, and other new materials and methods play important roles in modern agricultural progress. These changes have caused a shift of emphasis toward specialization rather than generalization.

It is recognized that there always will be a need for updating and revising this administrative guide. The content of this guide and the local teaching calendar should be coordinated with the local advisory committee in determining what is to be taught at the individual school level.

## GUIDE APPLICATION

This administrative guide is based on the following Dictionary of Occupational Titles (DOT) job titles in the occupational domain of agricultural production:

DOT Job Title	DOT Code
General Manager, Farm	180.167-018
Group Leader	180.167-022
Manager, Dairy Farm	180.167-026
Manager, Poultry Hatchery	180.167-046
Barn Boss	410.131-010
Fur Farmer	410.161-014
Livestock Rancher	410.161-018
Lamber	410.364-010
Farmworker, Livestock	410.664-010
Animal Caretaker	410.674-010
Cowpuncher	410.674-014
Livestock-Yard Attendant	410.674-018
Stable Attendant	410.674-022
Farmworker, Dairy	410.684-010
Sheep Shearer	410.684-014
Milker, Machine	410.685-010
Goat Herder	410.687-014
Sheep Herder	410.687-022
Poultry Farmer	411.161-018
Farmworker, Poultry	411.584-010
Laborer, Poultry Farm	411.687-018
Laborer, Poultry Hatchery	411.687-022
Poultry Debeaker	411.687-026
Bee Keeper	413.161-010
Farmer, General	421.161-010
Farmworker, General 1	421.683-010
Farmworker, General 2	421.687-010
Fish Farmer	446.161-010
Sales Representative, Animal-Feed Products	272.357-010
Farmer, Cash Grain	401.161-010
Farmworker, Grain 1	401.683-010
Farmworker, Grain 2	401.687-010
Farmer, Vegetable	402.161-010
Farmworker, Vegetable 1	402.663-010
Farmworker, Vegetable 2	402.687-010
Harvest Worker, Vegetable	402.687-014
Supervisor, Tree-Fruit-and- Nut Farming	403.131-010

DOT Job Title	DOT Code
Supervisor, Vine-Fruit Farming	403.131-014
Farmer, Tree-Fruit-and-Nut Crops	403.161-010
Farmer, Vine-Fruit Crops	403.161-014
Farmworker, Fruit 1	403.683-010
Farmworker, Fruit 2	403.687-010
Harvest Worker, Fruit	403.687-018
Vine Pruner	403.687-022
Farmer, Field Crop	404.161-010
Farmworker, Field Crop 1	404.663-010
Farmworker, Field Crop 2	404.687-010
Harvest Worker, Field Crop	404.687-014
Farmer, Diversified Crops	407.161-010
Farmworker, Diversified Crops 1	407.663-010
Farmworker, Diversified Crops 2	407.687-010
Sprayer, Hand	408.684-014
Farm-Machine Operator	409.683-010
Field Hauler	409.683-014
Irrigator, Value Pipe	409.684-010
Irrigator, Sprinkling System	409.685-014
Farmworker, Machine	409.686-010

This guide is of use in developing and selecting instructional materials and in implementing competency-based education for the following program and courses:

Program	Courses
Agricultural Production (01.0301)	Agricultural Production Technology (III) 8010 Agricultural Production Management (IV) 8012 Operating the Farm Business (V) 8014

Additional information concerning the application and use of this publication may be obtained from the following office:

**Agricultural Education Service**  
**Vocational and Adult Education**  
**Department of Education**  
**P.O. Box 6Q**  
**Richmond, Virginia 23216**



## OVERVIEW OF THE PROGRAM

This guide reflects certain basic facts that affect agricultural education. They include the following:

- The job of preparing individuals to engage in farming is of more importance and is more complicated and difficult than ever before. Although the percentage of the population engaged in farming has decreased, the quality of products and efficiency of production must be improved constantly.
- The influence of science and technology necessitates greater emphasis in farm management and agricultural mechanics. More attention must be given to teaching basic principles upon which sound management decisions are based.
- The family farm is still an important unit in Virginia agriculture. Agricultural education should continue to contribute to the development of the farm family unit.
- In many communities the agricultural education program should give attention to the needs of people who work at two jobs: farming and other employment.
- Agricultural education provides valuable training for students who plan to attend college. Youths must be given the opportunity to explore and discover their interests and abilities. For many of them, their only experience with actual farming before they reach the age of 18 will be through their supervised occupational experience programs.
- Agricultural education offers an opportunity for making the life sciences and other high school courses more meaningful to many students. Biology, chemistry, physics, mathematics, economics, English, and other subjects can be related to the supervised occupational experience programs and problems in agriculture.
- Farming is changing so rapidly that much of the vocational training in agriculture must be done through continuing education. Out-of-school agricultural education for young and adult farmers, including individual on-farm instruction, is essential.

- Supervised occupational experiences in agricultural production may be carried out on the home farm, at the school, or through cooperative programs. High school students need to learn, through actual practice, the basic skills and understanding essential to successful entry into farming.
- The Future Farmers of America (FFA) organization is an integral part of agricultural education. The purposes of the organization are to develop leadership, citizenship, and cooperation. These purposes are well suited to meet the needs of all students enrolled in agricultural education, regardless of their occupational choices.
- The need for capable leadership in agriculture is urgent. Therefore, agricultural education teachers and others should provide guidance and counseling so that students may realize their fullest potential in the industry of agriculture.

## PURPOSES

1. To prepare high school students for proficiency and establishment in agricultural production.
2. To prepare students for the successful analysis and management of farm business.
3. To provide a sound background for continuing education in agriculture.
4. To develop worthy use of leisure time and the desired cultural practices in family living and community responsibility.

This program is designed to cover two or three years, depending upon completion of Agricultural Mechanics and Basic Plant and Animal Science. If Agricultural Mechanics and Basic Plant Science is offered in the eighth grade, three years will be available in the option. If it is started in the ninth grade, only two years will be available.

## SECONDARY PROGRAM AND COURSES

**PROGRAM TITLE:** AGRICULTURAL PRODUCTION

**DESCRIPTION:** The curriculum for the three production courses is based on the assumption that students have completed the courses of Agricultural Mechanics and Basic Plant and Animal Science. The major emphasis is directed toward helping students become more proficient in animal, plant, and soil sciences and in farm business management and agricultural mechanics. Leadership training is provided, and supervised occupational experience programs are incorporated whenever possible.

**CIP CODE:** 01.0301

**SUGGESTED  
GRADE LEVELS:** 10, 11, 12

APPROVED COURSES	VA COURSE CODE
Agricultural Production Technology III	8010
Agricultural Production Management IV	8012
Operating the Farm Business V	8014

**AGRICULTURAL PRODUCTION TECHNOLOGY III (8010)**

**COURSE DESCRIPTION:** Agricultural Production Technology is a one-year occupational preparation course offered at the tenth- or eleventh-grade level. When only single periods are provided, greater emphasis is placed on individualized instruction and supervised occupational experience programs. The major emphasis in the agricultural production program is the attainment of competencies in one or more areas of plant science, animal science, soil science, agricultural business management, and agricultural mechanization, based upon the student's employment objective. The course includes appropriate instruction in agricultural mechanics, crop production, farm family living, and basic farm management. Supervised occupational experience programs and leadership training are important parts of the course.

**PREREQUISITE:** Agricultural Mechanics and Basic Animal Science

**SUGGESTED GRADE LEVEL:** 10 or 11

**AGRICULTURAL PRODUCTION TECHNOLOGY III (8010)**

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**CONTENT OUTLINE**

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- I. ORIENTING THE STUDENT TO AGRICULTURAL PRODUCTION**
  - A. Departmental policies
  - B. Safety procedures
  - C. Maintenance procedures
  - D. Occupational tasks
  - E. FFA membership
  
- II. DEVELOPING LEADERSHIP SKILLS**
  - A. FFA officers
  - B. Oral presentation
  - C. Panel discussion
  - D. News release
  - E. Committee meeting
  
- III. USING MECHANICS IN AGRICULTURAL PRODUCTION**
  - A. Electrical systems
  - B. Construction plans
  - C. Farm equipment

IV. USING PLANT SCIENCE IN AGRICULTURAL PRODUCTION

- A. Map interpretation
- B. Disease control
- C. Growing crops
- D. Crop exhibit

V. MANAGING NATURAL RESOURCES

- A. Relationship of agriculture and environment
- B. Pollution problems
- C. Water use
- D. Water pollution
- E. Soil conservation
- F. Government organizations
- G. Wildlife management
- H. Pond construction
- I. Forests
- J. Fire control

VI. MAINTAINING THE HOME LAWN

- A. Planting preparations
- B. Growing plants
- C. Disease/insect control
- D. Tree/shrub maintenance

VII. MANAGING FAMILY RESOURCES

- A. Family budget
- B. Personal/family goals
- C. Safety survey
- D. Use of time

VIII. OPERATING THE FARM AS AN AGRICULTURAL BUSINESS

- A. Financial goals
- B. Farm enterprise
- C. Livestock program
- D. Breeding services contract
- E. Livestock improvement
- F. Insurance coverage

**AGRICULTURAL PRODUCTION MANAGEMENT IV (8012)**

**COURSE DESCRIPTION:** Agricultural Production Management is a one-year occupational course offered at the eleventh- or twelfth-grade levels. The course includes instruction in agricultural mechanics, with emphasis placed on the application of mechanical skills to farm power and machinery, soil and water management, supervised farming programs, and leadership training.

**PREREQUISITE:** Agricultural Production Technology III (8010)

**SUGGESTED  
GRADE LEVEL:** 11 or 12



**AGRICULTURAL PRODUCTION MANAGEMENT IV (8012)**

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**CONTENT OUTLINE**

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- I. ORIENTING THE STUDENT TO AGRICULTURAL PRODUCTION
  - A. Departmental policies for classroom procedures (review as needed)
  - B. Occupational tasks
  - C. FFA membership
  
- II. USING MECHANICS IN AGRICULTURAL PRODUCTION
  - A. Electrical systems
  - B. Construction plans
  - C. Irrigation systems
  - D. Farm equipment
  
- III. USING PLANT SCIENCE IN AGRICULTURAL PRODUCTION
  - A. Disease control
  - B. Planting preparations
  - C. Growing crops
  - D. Crop management
  - E. Crop cultivation

IV. MANAGING FAMILY RESOURCES

- A. Community improvement
- B. Homestead improvement

V. OPERATING THE FARM AS AN AGRICULTURAL BUSINESS

- A. Rent/lease agreements
- B. Ownership transfer
- C. Livestock feeding program
- D. Livestock marketing plan
- E. Livestock insurance
- F. Financial calculations
- G. Service contracts

VI. PRODUCING POULTRY

- A. Breeds
- B. Feeding practices
- C. Marketing plan
- D. Disease/parasite control
- E. Management

VII. MANAGING AN APIARY

- A. Site selection
- B. Equipment and supplies
- C. Honeybee stock

VII. MANAGING AN APIARY (continued)

D. Feeding

E. Disease, insects, parasite control

F. Marketing plan

**OPERATING THE FARM BUSINESS V (8014)**

**COURSE DESCRIPTION:** Operating the Farm Business is a one-year occupational preparation course offered at the twelfth-grade level. Much of the instruction may be provided through individualized instruction. Emphasis is placed on establishment in farming, farm management, and occupational experience. Students receive instruction in adjusting, operating, and maintaining farm machinery and equipment and in planning and constructing farm buildings and facilities. Continued emphasis is placed on leadership training.

**PREREQUISITE:** Agricultural Production Management IV (8012)

**SUGGESTED  
GRADE LEVEL:** 12

**OPERATING THE FARM BUSINESS V (8014)**

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**CONTENT OUTLINE**

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- I. **ORIENTING THE STUDENT TO AGRICULTURAL PRODUCTION**
  - A. Departmental policies for class-room (review as needed)
  - B. Occupational tasks
  - C. FFA membership
  
- II. **USING MECHANICS IN AGRICULTURAL PRODUCTION**
  - A. Electrical systems
  - B. Construction plans
  - C. Irrigation systems
  - D. Farm equipment
  
- III. **USING PLANT SCIENCE IN AGRICULTURAL PRODUCTION**
  - A. Map interpretation
  - B. Disease control
  - C. Crop cultivation
  - D. Crop exhibit
  
- IV. **MANAGING NATURAL RESOURCES**
  - A. Water use
  - B. Soil conservation

- IV. MANAGING NATURAL RESOURCES (continued)
  - C. Pond maintenance
  - D. Wildlife management
  - E. Growing Christmas trees
  - F. Timber management
  - G. Fire control
  
- V. OPERATING THE FARM AS AN AGRICULTURAL BUSINESS
  - A. Labor management
  - B. Livestock program
  - C. Expansion plan
  - D. Tax records
  - E. Credit plan
  - F. Bestowing estate
  
- VI. PRODUCING POULTRY
  - A. Breeds
  - B. Feeding practices
  - C. Marketing plan
  - D. Disease/parasite control
  - E. Management
  
- VII. MANAGING AN APIARY
  - A. Site selection
  - B. Equipment and supplies

VII. MANAGING AN APIARY (continued)

- C. Honeybee stock
- D. Feeding
- E. Disease/insect/ parasite control
- F. Marketing plan

## LIVESTOCK PRODUCTION

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### CONTENT OUTLINE

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Note: The competencies identified in the following outline may be integrated into the instructional sequence for Agricultural Production III, IV, and V according to the needs of students and the local community.

- I. PERFORMING GENERAL LIVESTOCK DUTIES
  - A. Livestock identification
  - B. Livestock castration
  - C. Livestock restraint
  - D. Livestock bedding
  - E. Livestock loading procedure
  - F. Livestock injury treatments (disinfectants)
  - G. Livestock parasite control
  - H. Livestock vaccination
  - I. Livestock diseases and treatments
  - J. Dead livestock disposal
  - K. Livestock fitting and showing
  - L. Livestock production records
  - M. Farm income/expense records
  
- II. RAISING BEEF CATTLE
  - A. Selection
  - B. Criteria used to cull undesirable cows
  - C. Controlled seasonal breeding program



## II. RAISING BEEF CATTLE (continued)

- D. Signs of heat in cows\*
- E. Signs of pregnancy in cows\*
- F. Calf delivery assistance\*
- G. Care of newborn calves\*
- H. Calf-weaning procedure\*
- I. Creepfeeding of calves\*
- J. Dehorning procedure\*
- K. Feeding program
- L. Herd bull management
- M. Beef production operational costs

## III. RAISING DAIRY CATTLE

- A. Ideal dairy animal selection
- B. Breeding program
- C. Artificial insemination
- D. Fertility improvement program
- E. Heifer replacement plan
- F. Extra teat removal
- G. Dry cow management
- H. Mastitis control
- I. Hoof trimming
- J. Clipping procedures

\*Competency common to both beef and dairy cow operations

### III. RAISING DAIRY CATTLE (continued)

- K. Milk quality assurance
- L. Milking equipment operation
- M. Cleaning of vacuum lines
- N. Recommended milking practices
- O. Dairy cow nutrient requirements
- P. Dairy cow feed rations
- Q. Dairy cattle housing

### IV. RAISING SWINE

- A. Swine production systems
- B. Swine selection
- C. Breeding stock selection
- D. Breeding management
- E. Sow/gilt management during breeding and gestation
- F. Sow management during farrowing and lactation
- G. Boar management
- H. Care of baby pigs from birth to weaning
- I. Weaning procedure
- J. Swine housing
- K. Waste management
- L. Nutrient requirements and sources
- M. Marketing of slaughter hogs
- N. Marketing of feeder pigs

## V. RAISING HORSES

- A. Horse selection criteria
- B. Age determination
- C. Measurements used to describe horses
- D. Horse grooming procedures
- E. Foot care
- F. Training procedures
- G. Breeding program
- H. Care of foal from birth to weaning
- I. Weaning procedures
- J. Stallion maintenance
- K. Nutritional requirements
- L. Horse health maintenance
- M. Horse markets
- N. Tack

## VI. RAISING SHEEP

- A. Sheep selection
- B. Lambing system selection
- C. Ram management
- D. Breeding management practices
- E. Lambing procedures
- F. Care of lambs from birth to weaning

- VI. RAISING SHEEP (continued)
  - G. Sheep health maintenance
  - H. Feed requirements
  - I. Housing and equipment
  - J. Sheep marketing procedures
  - K. Wool shearing operations
  - L. Wool marketing operations

## APPENDICES

- Appendix A      Tool and Equipment List
- Appendix B      Resources for Livestock Production
- Appendix C      Resources for Agricultural Production
- Appendix D      Recommended Facility Plans and Inclusions

APPENDIX A  
TOOL AND EQUIPMENT LIST

Adjustable Metal Stands  
Air Compressor  
Anvil  
Auger - PTO  
AVR Tester  
Awls  
Battery Charger  
Battery Charger Accessories  
Battery Service Kits  
Battery Starter Tester  
Battery Testers  
Bevels  
Blade - Scraper  
Branding Sets  
Buckets  
Bushing Inserter and Remover  
Calipers  
Cam Shaft Bearing Tools  
Chain Hoist  
Chisels  
Cold Frames  
Clamps (various)  
Combination Analyzer  
Compass, Surveying and Staff  
Crane, Portable Hydraulic  
Creeper  
Cultivators  
Current Indicator  
Cutters (bolt, pipe, tubing)  
Cyclone Spreader  
Cylinder Sleeve Puller  
Disk Harrows  
Drain Pan  
Drills  
Drop Spreader  
Dynamometer, Tractor PTO  
Electric Clippers  
Electric Groomer  
Electrical Kits  
Engine Analysis Test Equipment

Engine Repair Stand  
 Farm-Level, Telescopic and Tripod  
 Files (various)  
 Flaring Tool  
 Funnels  
 Greenhouse  
 Greenhouse Air Circulation System  
 Greenhouse Automatic Cooling System  
 Greenhouse Automatic Ventilation  
     Equipment  
 Greenhouse Benches  
 Greenhouse Pot Moving Carts  
 Grinder, Compost  
 Guns (caulking, grease, soldering, staple, etc.)  
 Hammers (ball peen, claw, machinist's riveting, sledge,  
     soft face, tack)  
 Heating Tables with thermostats  
 Hive, Standard or all weather  
 Hoes  
 Hoist  
 Honey Extractor (centrifugal)  
 Hose (garden, rubber)  
 Hot Beds  
 Hydraulic System Tester  
 Hydraulic Tester Accessories  
 Hydro-Flator  
 Ignition Simulator  
 Ignition Tester  
 Incandescent Photoperiod Lights  
 Ladder  
 Lathe House  
 Lawn Edger/Trimmers  
 Lawn Roller  
 Lawn Vacuum  
 Levels (surveyor, carpenter's, line)  
 Livestock Chute  
 Livestock Scale  
 Magnetic Ignition Analyzer  
 Mask Respirators with cartridges  
 Micrometer  
 Mitre Box  
 Mobile Floor Jack  
 Oil Seal Installer  
 Oilers  
 Oscilloscope, Engine Analyzers

Paint Brushes  
Pliers (various)  
Planes (bench, block, jack)  
Plows  
Portable Floor Crane  
Pullers, Bearing, Hydraulic Ram and Pump (set)  
Saws (back, chain, compass, crosscut,  
hack, keyhole)  
Screwdrivers (various)  
Soldering Iron  
Stud Remover  
Surveying Chain  
Tachometer  
Testers, Combustion Analyzer  
Testers, Vacuum Fuel Pump  
Tie Rod Separator  
Timing Light  
Vaccinating Instruments (set)  
Valve Refacing Lathe  
Vises (drill press, machinist's, pipe,  
woodworking)  
Welder (arc, oxygen-acetylene)  
Welding Accessories  
Wheelbarrows  
Wrenches (various)



## APPENDIX B

## SUGGESTED RESOURCES

This appendix includes a list of references used to prepare the Task Analyses for Livestock Production, a list of additional references identified by teachers as being helpful in developing competency-based instruction in livestock production and management, and a list of suggested audiovisual aids and their suppliers.

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Approved Practices in Beef Cattle Production. Juergenson, E. M. The Interstate Printers & Publishers, Inc., Danville, Illinois, 1974.

Approved Practices in Feeds and Feeding. Patton, W. R.; Cassard D. W.; and Juergenson, E. M. The Interstate Printers & Publishers, Inc., Danville, Illinois, 1971.

Approved Practices in Raising & Handling Horses. Ulmer D. E., and Juergenson, E. M. The Interstate Printers & Publishers, Inc., Danville, Illinois, 1974.

Approved Practices In Swine Production. Baker, J. K., and Juergenson, E. M. The Interstate Printers & Publishers, Inc., Danville, Illinois, 1971.

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Beef Production in the South. Fowler, S. H. The Interstate Printers & Publishers, Inc., Danville, Illinois, 1979.

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Feed Formulations. Perry, T. W. The Interstate Printers & Publishers, Inc., Danville, Illinois, 1975.

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Handbook of Livestock Equipment. Juergenson, E. M. The Interstate Printers & Publishers, Inc., Danville, Illinois, 1979.

Livestock--Judging, Selection and Evaluation. Hunsley, R. E.; Beeson, W. M.; and Nordby, J. E. The Interstate Printers & Publishers, Inc., Danville, Illinois, 1970.

Merck Veterinary Manual. Siegmund, O. H. Merck & Co. Inc., Rahway, New Jersey, 1979.

Working in Animal Science. Christenson, P., and Nelson, E. A. Gregg Division, McGraw-Hill Book Company, New York, 1978.

**B. Student Materials**

The following student materials, published by Vocational Instructional Services, Texas A&M University, College Station, Texas, are recommended in addition to those listed in the bibliography.

Animal Reproduction

Artificial Insemination

Breeding Systems

Breeds of Dairy Cattle

Breeds of Horses

Breeds of Sheep

Breeds of Swine

Carcass Evaluation

Carcass Judging and Grading

Care of Livestock at Parturition

Circulatory and Respiratory Systems

Digestive Systems

Genetics

Injection Procedures

Live Animal Judging and Grading

Methods of Breeding Livestock

Performance and Production Testing

Planning Livestock Facilities

Pregnancy Diagnosis (Palpation)

Rations

Skeletal and Muscular Systems

Supervised Experience Program Record Book for  
Production Agriculture

V.A. I. Animal Science (Technical Information--  
includes 99 transparency masters)

V.A. II Animal Science (Technical Information--  
includes 116 transparency masters)

### III. Audiovisual Materials.

This section contains listings of audiovisual materials identified by teachers as being useful in implementing competency-based instruction in Livestock Production.

- A. Division of Media and Instructional Technology,  
Virginia Department of Education, P.O. Box 6Q,  
Richmond, VA 23216

#### 16mm Films

Agricultural Chemicals--Resistance of Insects to  
Insecticides  
Agricultural Chemicals--Selecting Nonchemical  
Methods of Insect Control  
Agriculture Machine Maintenance  
Back the Attack on Brucellosis  
Cattle an' the Corn Belt--The Midwest  
Cattleman--A Rancher's Story  
Dairy Farm Today  
Dairy Products--From Moo to You  
Farm Babies and Their Mothers  
Farrowing Pigs  
Hog Sanitation with Concrete  
Meat, Milk, and Money with Livestock on Concrete  
Our Changing Way of Life--The Dairy Farmer  
Pork--The Meal with the Squeal  
Pride--The Saddle Horse  
Sheep--How They Live  
Three More Little Pigs Go to Market  
Venezuelan Equine Encephomyelitis--A National  
Emergency  
Your Lamb Goes to the Fair

- B. Vocational Agriculture Service, 434 Mumford Hall,  
Urbana, IL 61801

#### Filmstrips/Cassettes

Aberdeen Angus Judging Classes  
Appraising Market Hogs for Carcass Merit  
Breeds of Dairy Cattle  
Breeds of Swine  
Dehorning Cattle  
Holstein Judging Classes

Filmstrips/Cassettes (continued)

Identification of Kinds of Meat  
 Identification of Pork Cuts  
 New and Exotic Breeds of Cattle  
 Pests of Cattle  
 Selecting Beef Breeding Animals  
 Swine and Pork Carcass Grades  
 USDA Grades of Beef

Slides/Cassettes

Swine Facilities

- C. Vocational Education Productions, California  
 Polytechnic State University, San Luis Obispo, CA  
 93407

Filmstip/Cassettes

Artificial Insemination of Beef and Dairy Cattle  
 Beef Cattle Body Types  
 Beginner's Guide to Buying a Horse  
 The Brood Sow and Litter  
 Embryo Transfer of Beef and Dairy Cattle  
 Identification of Beef Cuts  
 Introduction to Swine Management  
 Swine Health Care

Slides

Beginner's Guide to Buying a Horse  
 Horse Breeds and Color Type

- D. Nasco Agricultural Sciences, 1524 Princeton Avenue,  
 Modesto, CA 95352

Filmstrips/Cassettes

Artificial Breeding of Dairy Cattle  
 Breeds of Beef Cattle  
 Judging Dairy Cattle  
 Raising Dairy Calves  
 Vaccinating Methods

Slides

Diseases in Feeder Cattle  
Judging Livestock

- E. Prentice-Hall Media, 150 White Plains Road,  
Tarrytown, NY 10591

16mm Films

An Introduction to Sheep Breed Identification  
Nutrition and Health in Sheep  
Production Systems for Sheep  
Sheep Reproduction and Management

Filmstrips/Cassettes

Beef Breed Selection  
British Breeds  
Boar Selection  
Continental Breeds  
Dairy Breeding Systems  
Dairy Breed Selection  
Female Selection in Swine  
An Introduction to Swine Breed Identification  
Selecting Dairy Females  
Selecting Beef Females  
Selecting Beef Sires and Crossbreeds  
Swine Breeding Systems

- F. Hobar Publications, Colonial Films, Inc., Atlanta, GA

Filmstrip/Cassette

Black Leg

Slides/Cassettes

Artificial Insemination in Beef Cattle  
Baby Pig Management and Skills  
Beef Facilities  
Ruminant Stomachs

8mm Film

Good Milking Procedures



#### IV. Computer Software

The following software applications are identified in the Summer/Fall 1987 Computer Software Catalog from the American Association for Vocational Instructional Materials (AAVIM). They were not included in the Task Analyses for Livestock Production. Refer to the catalog for complete descriptions, specific hardware requirements, price lists, ordering information, and software review policies. The catalog can be obtained by contacting AAVIM, 120 Driftmier Engineering Center, Athens, GA 30602.

##### A. Agricultural Sciences Review. Hobar Publications. (Apple II, TRS-80, IBM-PC)

Beef Production (450 questions)  
Dairy Production (450 questions)  
Dairy Production (450 questions)  
Livestock Diseases and Parasites (300 questions)  
Milk and Milk Quality (350 questions)  
Sheep Production (400 questions)  
Swine Production (450 questions)

##### B. Computer Simulations and Tutorials

Calf Crop. Hobar Publications. (TRS-80, IBM-PC)  
Cattle Weight Adjustments. Agricultural Computer Services. (No hardware specifications given)  
Dairy Ration Master. Agri-Comp Systems. (Apple II)  
Hay Purchase. Agricultural Computer Services. (Apple II, TRS-80)  
Livestock Management Games. Agricultural Computer Services. (Apple II, TRS-80)

1. Cattle Game
2. Dairy Game
3. Sheep Game
4. Swine Game

Livestock Production Programs. Agri-Comp Systems.  
(Apple II)

1. Beef Production
2. Dairy Production
3. Feeds and Feeding
4. Horses
5. Meats
6. Sheep Production
7. Swine Production

Project Animals. Agricultural Computer Services.  
(Apple II, TRS-80)

1. Project Lamb
2. Project Hog
3. Project Steer

C. Agricultural Business

Agricultural Financial Calculations. Photocom. (Apple,  
IBM)

Introduction to Computers in Agribusiness. Agri-Comp  
Systems. (Apple II)

Management Calendar Creator. Hobar Publications.  
(Apple II)

Types of and Calculating Depreciation. Hobar  
Publications. (Apple II)

## APPENDIX C

I. REFERENCES USED IN TASK ANALYSES FOR AGRICULTURAL PRODUCTION

Agricultural Shop Safety: Teacher's Guide. Clemson, South Carolina: Department of Agricultural Education, Clemson University, 1969.

American Association for Vocational Instructional Materials (AAVIM). Athens, Georgia.

Applying Pesticides.

Arc Welding.

Building Fences, 1974.

Construction: Basic Principles.

Crop Chemicals.

Developing Shop Safety Skills, 1984.

Electric Motors--Selection, Protection, Drives.

Electric Motors--Teacher Guide.

Electric Motors--Student Workbook.

Electrical Wiring, 3rd ed., 1985.

Farm Tractors: Preventive Maintenance.

Fuels and Lubricants, 1983.

How Electric Motors Start and Run, 1980.

Hydraulics: Hydraulic Systems for Tractors and Other Mobile Equipment, Vol. I: Care and Operation, 1974.

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Maintaining the Lighting and Wiring System, 1980.

Planning Fences, 1980.

Planning for an Individual Water System.

Planning for an Irrigation System, 1980.

Safety Color Coding for the Shop, 1982.

Selecting and Storing Fuels and Lubricants.

Shop Planning, 1975.

Specifications for Tune-up and Service of Farm Tractors, 1982.

Tractor Maintenance, 1975.

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Insect Pests of Field Crops and Stored Grains.

The Law and You.

Marketing Agricultural Products.

The Nursery Worker.

Seed Production of Corn, Soybeans, and Small  
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Teaching Tree Identification.

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Balancing The Labor Supply and The Farm Business.

Collecting and Preparing Soil Samples for Testing.  
Common Problems of Soybeans.

Controlling Weeds.

Controlling Tree and Shrub Insects.

Corn Insects and Their Control.

Determining Credit Needs on the Farm.

Determining Probable Soil Losses in Conservation.

Factors Involved in The Borrowing Process.

Fertilizing and Watering Shade and Ornamental Trees.

Field Arrangement Principles.

Growing and Selling Christmas Trees.

Growing Flowering Annuals.

Hunger Signs in Crops.

Identifying Tree and Shrub Insects.

The Insect Identification Manual.

Nature of Soil Acidity and Major Plant Nutrients.

PH Test for Soil Acidity.

Planning the Cropping System.

Planning a Fertilizer Program.

Planning The Nitrogen Program.  
Planning for Repayment of Loans.  
Planting and Care of Farm Forests.  
Pruning Shade Trees.  
Sources of Farm Credit.  
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## II. AUDIOVISUAL SUPPLIERS

American Association for Vocational Instructional Materials  
(AAVIM)

120 Driftmier Engineering Center  
Athens, Georgia 30602

Future Farmers of America  
National FFA Supply Service  
5632 Mt. Vernon Memorial Highway  
Alexandria, Virginia 22309

HOBAR Publications  
1234 Teller Road  
St. Paul, Minnesota 55112

Ohio Agricultural Education Curriculum Materials Service  
2120 Fyffe Road  
The Ohio State University  
Columbus, Ohio 43210-1099

Singer Career Systems  
80 Commerce Drive  
Rochester, New York 14623

Virginia Cooperative Extension Service  
Virginia Polytechnic Institute and State University  
Blacksburg, Virginia 24061

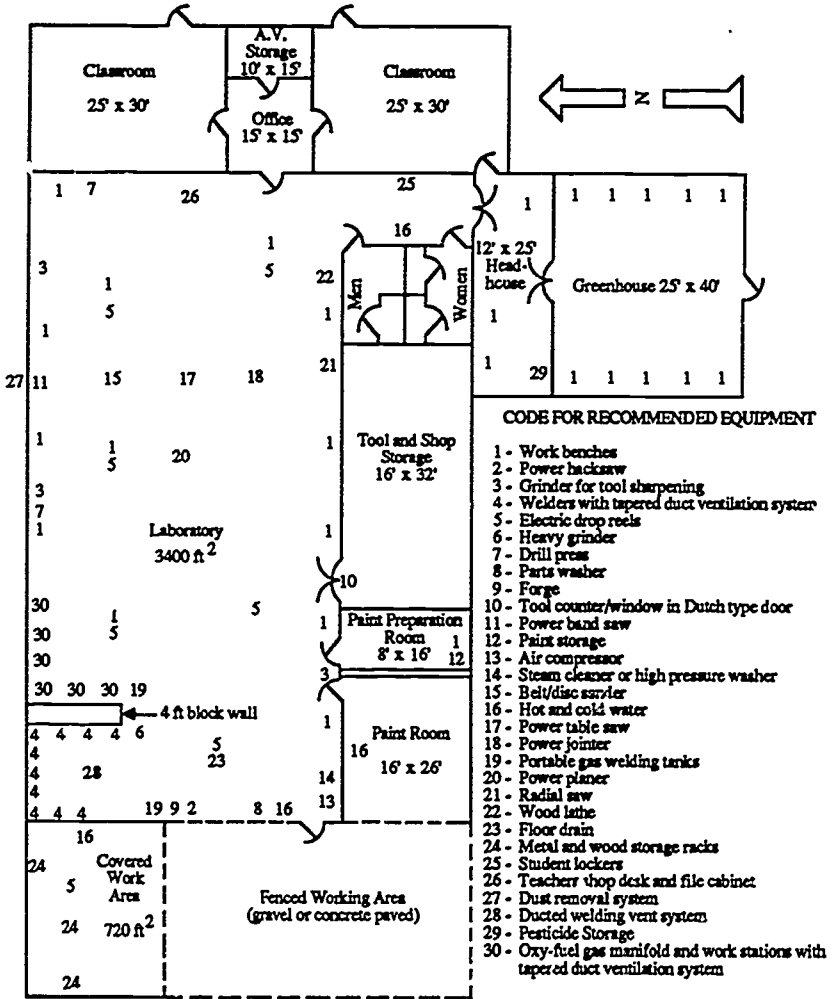
Vocational Agriculture Service  
College of Agriculture  
University of Illinois  
1401 South Maryland Drive  
Urbana, Illinois 61801

Vocational Education Productions  
California Polytechnic State University  
San Luis Obispo, California 93407

Vocational Media Associates  
Prentice Hall Media  
Box 1050  
Mount Kisco, New York 10549-9989

**APPENDIX D**

**RECOMMENDED FACILITY PLANS  
AND INCLUSIONS**



**RECOMMENDED INCLUSIONS**

- Exhaust**
- paint preparation room should have exhaust fan and vented storage cabinet.
  - welding stations should be exhausted away from students using tapered duct ventilation system with drops to each welding station.
- Floors**
- laboratory floor should be made of concrete with sufficient thickness to support weight of the heaviest load the facility will encounter. All concrete floors should be sealed.
- Shop drain**
- drain should be provided with drainage into a settling basin.
- Wash area**
- exterior concrete wash areas should be provided with drainage into a settling basin.
- Walls**
- height of walls 16' minimum or dictated by machinery size.
  - should be treated with epoxy paint or equivalent material for cleaning purposes. Treated area should be minimum of 7' high.
  - color should be light, example yellow, white, etc.
- Doors**
- equipment entrance doors should be 16' wide and 14' high.
  - exterior passage way doors should be provided adjacent to equipment entrance doors.



- Doors (continued)** - parts storage and tool-storage room doors should be 42" wide or a double door.
- Electrical Service**
- minimum of 600 AMP service should be provided.
  - master shut-off switch should be provided.
  - ground fault interrupters should be wired into circuitry.
  - welding outlet should be provided at laboratory center and rear entrance as well as in welding areas.
- Heat** - should have provisions for independent heat control for the laboratory.
- Lighting** - general lighting requirements for the laboratory 50-100 foot candles.
- Loading Ramp** - should be provided and located outside the fenced-in area with 360 access.
- Hot Water** - should be provided in hand washing and equipment cleaning areas.
- Compressed Air**
- outlets should be located at 40' intervals around exterior walls.
  - compressor should be located in out-of-the-way storage area if possible.
- Safety Glasses** - storage and sanitary cabinet should be located at the primary student entrance area of the laboratory.
- Roof Strength** - roof trusses should be of sufficient strength to support chain hoists and other equipment for lifting agricultural equipment.

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