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ABSTRACT

This study guide was specifically designed for individuals preparing to take the Georgia Teacher Certification Test (TCT) in agriculture. The agriculture test was developed by the National Evaluation Systems, Inc. and educators in Georgia. The test covers 13 subareas: (1) plant science; (2) crop management; (3) animal science; (4) livestock and poultry management; (5) livestock and poultry production; (6) soil science; (7) soil and water management; (8) agriculture mechanics; (9) agribusiness; (10) Future Farmers of America; (11) forestry; (12) horticulture; and (13) natural resources. This guide lists content objectives and suggested references for study in each of the 13 subareas. (JMK)

STUDY GUIDE FOR TCT IN AGRICULTURE

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National Evaluation Systems, Inc., has prepared for distribution by the Georgia Department of Education the set of content objectives found in this Study Guide. These objectives have been verified as important content requirements for initial certification. Not all of the listed objectives have had test items written for them. The selected objectives have not been identified. All objectives which appear here are certification requirements and a sampling of them will be tested.

When the project to develop the Georgia Teacher Certification Tests (TCT) was begun in November 1976, an Ad Hoc Committee composed of Georgia educators was appointed to work with NES on each TCT. The function of these Ad Hoc Committees was to review all NES-generated materials with a goal of making the materials more reflective of Georgia education needs. The first step in the test development process was that of content domain specification. Educators identified all content knowledge that an applicant would need to know to function effectively in a Georgia school. This content was further defined into content objectives, which were sent to currently practicing Georgia educators for verification. These educators provided actual ratings of the "job-relatedness" of the content objectives. At that point, it was possible to identify, from the original domain specification, the extent of essentiality of specific content skills for successful performance on the job. Test items were written for the most essential objectives which spanned the content of the field.

The purpose of providing objectives is to explicitly define the content required of an applicant for certification in this field. Further, the statement of these objectives should assist in preparing for the criterion-reference content knowledge test. We encourage applicants to study these materials, which will enhance their understanding of the content field and alleviate any unnecessary concerns about the nature of the Georgia Teacher Certification Tests.

Along with these materials go hopes for a rewarding career in education.

If you have questions or desire further information, contact:

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STUDY GUIDE FOR TCT IN AGRICULTURE

Georgia Teacher Certification Testing Program

Field 10: Agriculture

INTRODUCTION

This study guide was specifically designed for teachers preparing to take the Georgia Teacher Certification Test (TCT) in Agriculture. The Agriculture Test was developed by the National Evaluation Systems, Inc. and educators in the state of Georgia. The test covers thirteen subareas: Plant Science, Crop Management, Animal Science, Livestock and Poultry Management, Livestock and Poultry Production, Soil Science, Soil and Water Management, Agriculture Mechanics, Agribusiness Future Farmers of America, Forestry, Horticulture and Natural Resources.

The suggested references which follow the content objectives of each subarea should be helpful to potential teachers preparing to take the test. Most of the references listed are available from one of the state approved Agriculture Education programs in Georgia colleges and universities. Many of the references are high school level materials and may be found in high school departments of vocational agriculture. There are also many other excellent materials which have not been listed.

The listing of numerous sources does not mean that all are needed to grasp a particular concept or meet a given objective. Some examinees will have better access to certain sources than to other sources. Additionally, in some cases several subareas have been referenced to the same readings. This is because those readings cover several topics.

STUDY GUIDE FOR TCT IN AGRICULTURE

Georgia Teacher Certification Testing Program

Field 10: Agriculture Objectives and Suggested References

I. PLANT SCIENCE

OBJECTIVES

Identify the major agronomic crops grown in Georgia.

Identify the major horticultural crops grown in Georgia.

Identify the major forest crops grown in Georgia.

Identify the characteristics of a plant classified as annual.

Identify the characteristics of a plant classified as biennial.

Identify the characteristics of a plant classified as perennial.

Describe the process of photosynthesis as related to plant growth.

Describe the process of respiration as related to plant growth.

Describe the process of assimilation as related to plant growth.

Describe the process of absorption as related to plant growth.

Describe the process of transpiration as related to plant growth.

Describe the process of translocation as related to plant growth.

Identify symptoms of insect damage and the detrimental effects of insects on plant life.

Identify symptoms of plant diseases and their detrimental effects on plant life.

Identify environmental factors which have detrimental effects on plant life.

REFERENCES

Dickerson, I. A., Griner, C. P., and Anderson, C. Ag Science - Plant, Animal and Soil. Athens: Vocational Education Materials Center.

II. CROP MANAGEMENT

OBJECTIVES

For a given hypothetical area of land, apply the proper method(s) to measure land for crop production.

Indicate the functions of nitrogen, phosphorus, and potassium as they relate to plant growth.

REFERENCES

Dickerson, I. A., Griner. C. P., and Anderson, C. Ag Science - Plant, Animal and Soil. Athens: Vocational Education Materials Center.

Boone, L. V. et al. Producing Farm Crops. Danville: Interstate Printers and Publishers, 1975.

III. ANIMAL SCIENCE

OBJECTIVES

Summarize the historical importance, present scope, and economic value of Georgia's swine industry.

Summarize the historical importance, present scope, and economic value of Georgia's cattle industry.

Summarize the historical importance, present scope, and economic value of Georgia's poultry industry.

Recognize career opportunities in the livestock and poultry industries.

Identify the important economic requirements of a successful swine enterprise.

Identify the important economic requirements of a successful cattle enterprise.

Identify the important economic requirements of a successful poultry enterprise.

Identify the traits or characteristics used in identifyin breeds of livestock and poultr

Indicate the major types of livestock and poultry found in Georgia.

Identify various stages of animal growth and development.

Identify the basic nutrient needs of livestock.

Identify common feeds containi the basic nutrient needs of livestock.

Identify the bases used for animal selection.

Demonstrate a knowledge of the major animal diseases.

Indicate the origin of the maj livestock and poultry breeds i the United States.

REFERENCES

Dickerson, I. A., Griner, C. P., and Anderson, C. Ag Science - Plant, Animal and Soil. Athens: Vocational Education Materials Center.

Bundy, et al: Swine Production. (4th ed.) Englewood Cliffs: Prentice - Hall, Inc., 1976.

IV. LIVESTOCK AND POULTRY MANAGEMENT

OBJECTIVES

Recognize career opportunities in the area of swine, cattle, or poultry production.

Determine the functions of feed as they relate to the maintenance, growth, fattening, and reproduction of livestock and poultry.

Recognize the effects of heredity and environment on livestock and poultry production.

Identify the parts of the reproductive system in swine, cattle, and poultry, and indicate their functions.

Describe the process of fertilization in animal reproduction.

Distinguish between gestation and lactation periods.

Identify the USDA market grades of live cattle and swine.

Identify and use the USDA grades as criteria for evaluating swine, cattle, or poultry meats.

Identify the basic retail cuts of meat.

Distinguish between dominant and recessive characteristics with regard to livestock breeding.

Identify the different breeding systems for swine, cattle, or poultry.

REFERENCES

Dickerson, I. A., Griner, C. P., and Anderson, C. Ag Science - Plant, Animal and Soil. Athens: Vocational Education Materials Center.

Ensminger, M. E. Poultry Science, Danville: Interstate Printers and Publishers, 1971.

V. LIVESTOCK AND POULTRY PRODUCTION

OBJECTIVES

Identify basic buildings and equipment required in livestock or poultry production.

Indicate the functions of concentrates in the feeding of swine, cattle, or poultry.

Indicate the functions of roughage in the feeding of swine and cattle.

Indicate the functions of additives in the feeding of swine, cattle, or poultry.

Recognize the different systems for feeding swine, cattle, or poultry.

Determine the feed requirements for swine, cattle, or poultry.

Identify the factors determining types of feeding programs in livestock and poultry production.

Determine the relationship of heredity to production in the breeding of swine, cattle, and poultry.

Identify the length of the gestational period for the major classes of livestock.

Summarize the characteristics of the different systems for breeding swine, cattle, or poultry.

Identify the common diseases contributing to the major economic losses of swine, cattle, or poultry.

Identify basic methods for controlling diseases of swine, cattle, or poultry.

Identify basic methods for controlling parasites in swine, cattle, or poultry.

Determine the effects of supply and demand on livestock and poultry prices.

Identify the relationship of grades and prices on marketing livestock and poultry.

Identify special practices used in the production of swine, cattle, or poultry.

Identify ways in which an individual may become established in swine production.

Identify ways in which an individual may become established in cattle production.

REFERENCES

Dickerson, I. A., Griner, C. P., and Anderson, C. Ag Science - Plant, Animal and Soil. Athens: Vocational Education Materials Center.

Bundy, et al: Livestock and Poultry Production, (4th ed.), Englewood Cliffs: Prentice - Hall, Inc., 1975.

VI. SOIL SCIENCE

OBJECTIVES

Determine the effects of the parent rock material on soil formation.

Determine the effects of climate on soil formation.

Determine the effects of living organisms on soil formation.

Determine the effects of topography on soil formation.

Determine the effects of time on soil formation.

Identify the characteristics of sand.

Identify the characteristics of silt.

Identify the characteristics of clay.

Identify the functions of microorganisms in soils.

Identify the major chemicals components of soils.

REFERENCES

Dickerson, I. A., Griner, C. P., and Anderson, C. Ag Science - Plant, Animal and Soil. Athens: Vocational Education Materials Center.

Dickerson, I. A., Griner, C. P., and Anderson, C., Soil and Water Management.

VII. SOIL AND WATER MANAGEMENT

OBJECTIVES

Indicate ways in which sound soil and water management affect the environment.

Identify the characteristics used in classifying land.

Identify conservation practices for each of the land capability classes.

Determine the effects of conservation practices on the various land use systems.

Indicate proper management practices for grazing land.

REFERENCES

Dickerson, I. A., Griner, C. P., and Anderson, C. Ag Science - Plant, Animal and Soil. Athens: Vocational Education Materials Center.

Dickerson, I. A., Griner, C. P., and Anderson, C., Soil and Water Management. Athens: Vocational Education Materials Center, 1978.

VIII. AGRICULTURE MECHANICS

OBJECTIVES

Indicate possible sources for obtaining plans or drawings in areas for project planning.

Analyze the practicality of freehand sketches as drawings for project planning.

Indicate appropriate working drawings for a project plan developed from freehand sketches.

Identify the use of scaling, dimensioning, and material symbols in the development of working drawings.

Analyze the importance of preparing a bill of materials.

Indicate the essential steps of operation in successful project construction.

Recognize the imporatnce of management policies in agricultural mechanics laboratories.

Identify the basic principles by which hand tools are arranged properly in the agricultural mechanics laboratory.

Identify the basic principles by which itmes of large equipment are arranged properly in the gricultural mechanics laboratory.

Identify the basic principles by which other facilities are arranged properly in the agricultural mechanics laboratory.

Identify factors to consider when selecting manufactured wood products and hardware materials for a woodworking project.

Identify the factors to consider when selecting grades of lumber for a job.

Determine proper procedures to employ with the major kinds of handsaws available for woodworking.

Identify the common types of wood fasteners and indicate their uses.

Determine proper procedures to employ in measuring and marking wood for a woodworking project.

Identify the common types of hand bench planes.

Identify the proper procedures to use when cutting with wood chisels.

Identify the proper procedures to employ with the most common woodboring tools.

Indicate the proper use of different types of circular saw blades.

Indicate the steps to follow when adjusting the tilting-arbor circular saw for "ripping."

Identify the proper procedures for "ripping" wood with the tilting-arbor circular saw.

VIII. AGRICULTURE MECHANICS (continued)

Indicate the necessary equipment adjustments to be made when using the circular saw for "cross-cutting."

Indicate the steps to follow for the safe and efficient use of the portable electric saw.

Identify the procedures to follow in properly maintaining woodworking circular saws.

Identify the necessary machine adjustments to make when "crosscutting" lumber with the radial-arm saw.

Identify the principles of proper use of a jointer machine.

Identify safe and efficient ways of using a band saw.

Recognize how principles of surfacing lumber relate to the safe and efficient use of a thickness planer.

Describe the proper procedure for drilling when using the stationary drilling machine.

Identify the best procedures for preparing outside wood surfaces for painting.

Identify guidelines for applying outside paints.

Identify criteria for selecting and using grinders.

Identify the procedures common to the sharpening of knives, axes, hatchets, plane irons, wood chisels, and auger bits.

Identify the criteria to use in the proper selection of material and equipment for soldering.

Analyze the importance of cleaning surface to be soldered.

Distinguish between the procedures used in soldering coppe and those used in soldering galvanized steel.

Identify the properties that determine the kinds of iron and steel to use in metalwork projects.

Identify the common types of chisels used for cold metalwork

Identify the common kinds of pipes and their uses in simple plumbing.

Identify the common kinds of pipe fittings and their use in simple plumbing.

Demonstrate knowledge of the safety measures used in electric arc welding.

Recognize the need for proper preparation of the metals in electric arc welding.

Identify the methods used when making a butt weld in the flat position.

III. AGRICULTURE MECHANICS (continued)

OBJECTIVES

Identify the procedures for setting up and operating oxyacetylene equipment for welding.

Identify the proper procedures to use when cutting metals with an oxyacetylene flame.

Define electrical terms used in the selection and maintenance of electrical equipment.

Identify the criteria for selecting materials and equipment used with concrete.

Using tables or charts, select information needed to estimate materials for a specific concrete job.

Identify the procedures for handmixing concrete.

Identify the methods used in finishing concrete.

Identify the criteria for selecting units needed in farm masonry work.

Determine the procedure for laying masonry units.

REFERENCES

Phipps, L., Mechanics in Agriculture. Danville: Interstate Printers and Publishers, Inc., 1977.

Wakeman, T. J., Modern Agricultural Mechanics. Danville: Interstate Printers and Publishers, Inc., 1977.

IX. AGRIBUSINESS

OBJECTIVES

Identify trends of employment in agricultural occupations.

Analyze the function of agribusiness in the agricultural industry.

Identify the personal qualifications needed to obtain and keep a job in the agribusiness field.

Recognize the necessity for free enterprise in agribusiness firms.

Identify general business structures in the agribusiness field (e.g., private ownerships, cooperatives, corporations, and partnerships).

Identify sources of obtaining capital or credit when financing agricultural businesses.

Identify the role of recordkeeping in agricultural businesses.

Identify the need for properly executing legal documents in establishing and operating an agribusiness firm (such as contracts).

Identify the factors which an entrepreneur should consider in deciding where to purchase supplies for an agricultural business (cost, availability, distance, reputation of dealer, etc.).

Identify the major kinds of reports made by agribusiness firms.

Differentiate between net and gross income for an agribusiness firm.

Analyze the interrelationship of supply/demand and price of agricultural commodities.

Identify the basic resources necessary for the successful operation of an agricultural firm (land, labor, capital, management).

Determine the function of supervised occupational experience in a program of vocational agriculture.

REFERENCES

Wills, W. J., An Introduction to Agribusiness Management. Danville: Interstate Printers and Publishers, Inc., 1979.

X. FUTURE FARMERS OF AMERICA (F.F.A.)

OBJECTIVES

Recognize the relationship of the F.F.A. organization to the vocational agricultural program.

Identify the advisors' responsibilities to the local F.F.A. chapter.

Identify the organizational structure of the F.F.A. at the state and national levels.

Indicate the organizational structure of a local F.F.A. chapter.

Identify reasons for using parliamentary procedure when conducting F.F.A. meetings.

Identify the major areas of activities to be included in a chapter program of work in the F.F.A.

Analyze the function of contests in the F.F.A. program of activities.

Identify how individuals' participation in the F.F.A. activities will contribute to their personal development.

Recognize the importance of each individual's participation in carrying out the work of the F.F.A. chapter.

Indicate how participation in the F.F.A. can develop skills in communication.

Indicate how participation in the F.F.A. can develop skills needed for community activities.

Indicate how participation in the F.F.A. can develop the ability to cooperate with others.

Indicate how participation in the F.F.A. can contribute to establishing desirable standards of personal conduct.

REFERENCES

Amick, T., et al, F.F.A. Advisors Handbook (3rd ed.), Alexandria: F.F.A. Supply Service, 1981.

Seefeldt, R., et al, Student Handbook (4th Printing), Alexandria: F.F.A. Supply Service, 1980.

Lee, J., et al, Self-Study Guide on F.F.A., Alexandria: F.F.A. Supply Service.

XI. FORESTRY

OBJECTIVES

Identify common names of trees that have economic importance in Georgia.

Identify leaf characteristics of trees of economic importance in Georgia.

Recognize the economic importance of Georgia's forest industry.

Identify the flowers of trees that have economic importance in Georgia.

Identify factors to consider in analyzing the forest (e.g., age, density, growth rate, etc.).

Identify the harvest methods used in cutting uneven-aged and even-aged forest stands.

Identify the natural methods of reproduction that occur to establish a forest stand.

Identify the artificial methods of reproduction used in the establishment of forest land.

Identify the methods used to prevent fires from becoming a destructive agent of the forest.

Identify insects considered to be destructive agents of the forest.

Identify diseases considered to be destructive agents of the forest.

Identify formulas and units of measurement used to calculate quantities of forest products.

Apply the proper method(s) used in measuring land area.

REFERENCES

Dillard, B. M. and Register, W. D., Georgia Forest Practices, Athens: Vocational Education Materials Center, 1980.

XII. HORTICULTURE

OBJECTIVES

Analyze the effects of respiration on plant propagation.

Analyze the effects of transpiration on plant propagation.

Identify the types of cuttings used in the asexual propagation of plants.

Identify the types of layering used in the asexual propagation of plants.

Identify the method used to propagate bulbs.

Identify the types of grafting used in the asexual propagation of plants.

Identify the types of budding used in the asexual propagation of plants.

Identify the parts of plants necessary for (sexual) plant propagation.

Identify common insects destructive to ornamental plants.

Identify common diseases destructive to ornamental plants.

REFERENCES

Griner, C. P., et al: An Introduction in Plant Propagation. Athens: Vocational Education Materials Center.

Griner, C. P., et al: Fertilizing Bedding Plants. Athens: Vocational Education Materials Center.

Griner, C. P., et al: Procuring Bedding Plant Seed. Athens: Vocational Education Materials Center.

Griner, C. P., et al: Procuring Containers for Greenhouse Plants. Athens: Vocational Education Materials Center.

Griner, C. P., et al: Procuring Growing Media for Greenhouse Plants. Athens: Vocational Education Materials Center.

Griner, C. P., et al: Sterilizing Soil and Other Plant Growing Media. Athens: Vocational Education Materials Center.

Griner, C. P., et al: Germinating Bedding Seed and Transplanting. Athens: Vocational Education Materials Center.

Griner, C. P., et al: Controlling Insects of Greenhouse Plants. Athens: Vocational Education Materials Center.

Griner, C. P., et al: An Introduction to Horticulture. Athens: Vocational Education Materials Center.

Williams, G. S., Greenhouse Flowers and Bedding Plants for Agribusiness Studies. Danville: Interstate Printers and Publishers, Inc., 1975.

Williams, G. S. Nursery Crops and Landscape Designs for Agribusiness Studies. Danville: Interstate Printers and Publishers, Inc., 1982.

XIII. NATURAL RESOURCES

OBJECTIVES

Identify management techniques used to preserve wildlife.

Recognize some advantages of wildlife on the farm.

REFERENCES

Kircher, H. B. and Wallace, D. L. Our Natural Resources. Danville: Interstate Printers and Publishers, Inc., 1982.