THE LEVEL OF UNDERSTANDING OF FARM MANAGEMENT PRINCIPLES POSSESSED BY VOCATIONAL AGRICULTURE INSTRUCTORS OF VIRGINIA YOUNG FARMER PROGRAMS

by

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DEDICATION

This dissertation is dedicated with affection to my wife Alice and our sons Christopher and Daniel. Daniel was born during the final preparation of this dissertation. Dedication is extended to my parents Mr. and Mrs. Fredrick J. Rumpf and my parents-in-law Mr. and Mrs. Wilfred D. Hedges for their encouragement and patience.

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Chapter I

DESCRIPTION OF THE PROBLEM SITUATION

Understanding of farm management principles is essential to farmers who attempt to make decisions regarding the relationship of resources and product output. Obviously, these decisions are critical to all farmers who wish to stay in business and maximize net farm income.

According to the latest United States Census Bureau Report, the total number of farms in Virginia decreased by 19.6 percent between 1964 and 1969. Since the first United States Census of farms in 1935, the number of Virginia farms has diminished from 197,632 to 64,572 in 1969, a decrease of 67.3 percent. Over the same period, the average size of farms measured in acres has nearly doubled, increasing from 89.3 acres to 164.9 acres. In 1969, Virginia farm land and buildings were valued at $3,047,271,171. This represents a $47,191 average per farm value, an increase of 1,570 percent since 1935.[1] Boehlje reported that in 1975 the Nation's assets per farm totaled $184,500. Attributing to this rapid rise in assets were increases in

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[1]U.S. Department of Commerce, U.S. Bureau of Census, Census of Agriculture, 1969, Vol. 1, Area Reports (Washington: Government Printing Office, 1972), Part 24, p. 2.

farm land value and capital input per farm, that is, a greater inventory of machinery and farm facilities.[2]

Today, America's farmers are continually challenged to produce more food and fiber to supply not only the Nation's needs but also those of the world. As the number of people in food deficit countries continues to rise without a corresponding agriculture production increase, the importance of America's food productivity will intensify in the drive for political stability.

With the margin of profit decreased from previous years, farmers must rely more heavily upon their ability to make decisions on ". . . how to effectively organize and use resources available to (them). Right decisions result in a good chance in making money while wrong decisions lead to failure."[3] Thus, farmers will be depending more in the future upon vocational agriculture instructors to provide them instruction in the area of farm management principles.

THE PROBLEM

The problem was that the vocational agriculture instructors' level of understanding of farm management principles was unknown.

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[2]Michael Boehlje, "How Can You Plan Now for the Future?" IH Farm Forum, Vol. 3, No. 3 (1976), p. 2.

[3]Harold F. Duis, "A New Approach to Teaching Farm Management is Necessary," The Agricultural Education Magazine, Vol. 36, No. 3, (September, 1963), p. 51.

PURPOSE OF THE STUDY

The purpose of the study was to analyze the level of understanding of farm management principles possessed by vocational agriculture instructors of young farmer programs in the State of Virginia. In addition, this study attempted to (1) measure the relationship between various biographic characteristics of the vocational agriculture instructors and their level of understanding of farm management principles, (2) rank the importance of farm management instructional units, and (3) determine the quantity of time provided for farm management instruction within young farmer programs.

Findings of this study were used to suggest ways of improving farm management competencies of vocational agriculture instructors who teach or plan to teach farm management principles to young farmers.

OBJECTIVES

The specific objectives of the study were as follows:

1. to assess the level of understanding of farm management principles possessed by vocational agriculture instructors of young farmer programs in the State of Virginia as measured by The Agribusiness Achievement Test;

2. to measure the relationship between vocational agriculture instructors' level of understanding of farm management principles and the following independent variables:
   a. years as owner-manager of a farm enterprise,
   b. quarter hour credits of agricultural economics courses,
   c. quarter hour credits of business courses,
   d. number of non-credit management activities,
   e. years of teaching secondary vocational agriculture (grades 10-12),
   f. years of teaching pre-secondary vocational agriculture (grades 7-9),
   g. years of teaching young farmers or adults,
   h. total years of teaching vocational agriculture,
   i. age of vocational agriculture instructor,
   j. formal education achievement,
   k. years as Future Farmers of America member,
   l. years as 4-H Club member, and
   m. years reared on a farm;
3. to determine the ranking of importance of twenty-one farm management instructional units as identified in Cauley's findings of 1946; and
4. to determine the proportion of time allowed for farm management instruction in relation to the total time of instruction within young farmer programs.

RESEARCH HYPOTHESES

The following research hypotheses were established:

Hypothesis 1. The greater the number of years of experience as owner-managers of farm enterprises by vocational agriculture instructors, the greater will be their level of understanding of farm management principles.

Hypothesis 2. The greater the number of quarter hour credits of agricultural economics taken by vocational agriculture instructors, the greater will be their level of understanding of farm management principles.

Hypothesis 3. The greater the number of quarter hour credits of business courses taken by vocational agriculture instructors, the greater will be their level of understanding of farm management principles.

Hypothesis 4. The greater the number of years of secondary level vocational agriculture teaching experience by vocational agriculture instructors, the greater will be their level of understanding of farm management principles.

Hypothesis 5. The greater the age of the vocational agriculture instructors, the greater will be their level of understanding of farm management principles.

Hypothesis 6. The greater the formal education achievement of the vocational agriculture instructors, the greater will be their level of understanding of farm management principles.

Hypothesis 7. Vocational agriculture instructors who were former Future Farmers of America (FFA) and/or 4-H Club members possess a greater level of understanding of farm management principles than those who were not former FFA and/or 4-H Club members.

BASIC ASSUMPTIONS

The following assumptions were essential to the study:

1. A knowledge of farm management principles by vocational agriculture instructors is indicative to the learning which occurs through their instruction.
2. The instrument used in the study to measure the vocational agriculture instructors' level of understanding of farm management principles is valid and reliable.
3. The identification of various strengths and weaknesses of vocational agriculture instructors regarding farm management principles will be valuable in developing procedures to strengthen farm management instruction in the State of Virginia.

LIMITATIONS

The following limitations were recognized in the study:

1. The study was limited to those vocational agriculture instructors who teach young farmers in the State of Virginia.

2. The biographic data of the vocational agriculture instructors was obtained by using a questionnaire developed by the researcher.

DEFINITION OF TERMS

Farm management principles. Comprehensive and fundamental rules for the organization and operation of farms so as to obtain the maximum amount of continuous net income.

Farm enterprise. A unit of economic organization devoted to the raising of animals and/or crops for the purpose of profitability.

Management activity. A learning experience or occupational experience whereby the process of planning, directing, and evaluating leads to the accomplishment of an objective.

Young farmer. An individual of either sex who is engaged or is interested in becoming engaged in the industry of agriculture and possesses membership in a young farmer association. Age at the time of membership is from sixteen through thirty-five years.

Young farmer program. Organized instruction in agricultural education of less than college grade designed for young farmers under the provisions of the National Vocational Education Acts.

Vocational agriculture instructor. An individual of either sex who has been certified by the State of Virginia to teach vocational agriculture. Such certification requires at least a Bachelor's degree from an approved college or university.

Level of understanding. A concept to express the extent of knowledge possessed by vocational agriculture instructors of young farmer programs within the sample as measured by The Agribusiness Achievement Test.

Instructional unit. A subdivision of a teaching area, e.g., consider farm management as an area, then "farm law" and "taxes" would be designated as units of instruction.

Business courses. Courses taken in a college or university for credit providing general knowledge of business principles and practices.

SUMMARY

Chapter I of the study cited four reasons why farmers need an understanding of farm management principles. These reasons were (1) to maximize net farm income, (2) trend of decreasing number of farms, (3) trend of increasing assets per farm, and (4) increasing demand for American food and fiber throughout the world. Vocational agriculture instructors will assume a major role in teaching management principles to farmers and thus, must possess a knowledge of farm management principles.

The purpose of the study was to analyze the level of understanding of farm management principles possessed by vocational agriculture instructors of young farmer programs in the State of Virginia.

Chapter II

REVIEW OF LITERATURE

FACTORS CONTRIBUTING TO THE NEED FOR THE STUDY

Agriculture was one of the earliest endeavours of humans for self-preservation. People who lived in ancient civilizations and those of developing countries today possess the commonality of an agrarian economic system. Within this system, most of the efforts of production are devoted toward providing enough food and fiber to sustain itself. In contrast, the developed and technologically advanced countries produce agricultural products at a superior rate, thus freeing the economy to transfer a portion of the overall productivity to nonagricultural pursuits.

Hungry people are often unhappy people and tend to look for ways to relieve their unhappiness. Their search ultimately brings instability to democratic and nondemocratic governments alike. Nations where malnutrition is a constant reality have a strong tendency toward nonpeaceful change in leadership. Former Secretary of Defense Robert McNamara noted this tendency in 1966:

> Since 1958, only one of the twenty-seven (rich) nations has suffered a major internal upheaval on its own territory. Among the thirty-eight very poor nations--those with a per capita income of under $100 a year--not less than thirty-two have suffered an average of two major outbreaks of violence per country in the eight year period. That is a great deal of conflict. What is worse, it has been predominately conflict

> of a prolonged nature. There is an irrefutable relationship between violence and economic backwardness and the trend of such violence is up, not down.[4]

Carter in "The 1975 Report of the President's Council of Economic Advisors: Food and Agriculture," cited three developments as troublesome to world agriculture:[5]

1. a decline in the growth rate of world agriculture production,
2. a reduction in the supply of new land that can be brought into production, at least at supply prices of the past, and
3. an increase dependence on the United States as a supplier of agriculture products.

The world food-population balance controversy is being and will continue to be affected by these troublesome developments. In 1974, the world population growth was increasing at a rate of 2 percent per year. At this rate of growth, the population of the world will double to an estimated 7.6 billion people by the year 2009.[6]

The third troublesome development to world agriculture cited by Carter is of paramount importance to farmers of the United States,

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[4]Lester Brown, "The World Food/Population Problem: An Overview" (Ames, Iowa: Iowa State University, 1967), p. 13. (Mimeographed.)

[5]Harold O. Carter, "The 1975 Report of the President's Council of Economic Advisors: Food and Agriculture," The American Economic Review, Vol. 65, No. 4, (September, 1975), p. 536.

[6]USDA, "Food and Population," Foreign Agriculture, (August 26, 1974), pp. 9-12.

because they produce the grain which represents more than 50 percent of the total world grain imports. In fact, out of 150 countries in the world, only the United States, Canada and Australia export more food than they import.[7]

The impact of increased dependency upon farmers of the United States coupled with greater price instability because of reduction in surpluses will place a greater demand on the managerial capabilities of farmers in the United States. Over the past twenty years, the farmer in the United States has increased production efficiency from feeding himself and fifteen other people to feed fifty-two people beside himself.[8]

Throughout the world, agriculture demands and needs are cited by professional and nonprofessional people alike as universal problems facing humanity. In Rome, the recent World Food Conference focused on the point and resolved that:

> All governments should accept the removal of the scourge of hunger and malnutrition, which at present affects many millions of human beings, as the objective of the international community as a whole, and accept the goal that within a decade no child will go to bed hungry, that no family will fear for its next day's bread, and that no human being's future capacities will be stunted by malnutrition.[9]

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[7]Peter Tonge, "Farming: The Challenge Ahead," The Christian Science Monitor, 1976, p. 2. (Reprint).

[8]Ibid., p. 3.

[9]Elizabeth Y. Davis, "Priorities for USDA Research to Meet Family Needs," 1976 U.S. Agricultural Outlook, (Washington: U.S. Government Printing Office, 1975), p. 382.

In response to this resolution, a Conference on Research to Meet United States and World Needs was developed and implemented. Over 1,000 individuals representing scientists, administrators and policy makers at various levels, and consumers provided input toward the Conference findings. The findings of the Conference were catagorized into three broad areas:[10]

1. human needs for food,
2. organization of resources to provide food, and
3. management of resources to provide food.

At the 1976 American Vocational Association Conference, the report "Identifying Research Concerns of the Agricultural Education Profession" was presented to members of the American Association of Teacher Educators in Agriculture and the National Association of Supervisors of Agricultural Education. Fourteen areas of concern were identified and ranked in order of importance by supervisors, teachers, and teacher educators of agriculture. Teacher education and adult programs were ranked third and eighth respectively. Adult programs were defined for the purpose of the study to include young farmer classes and adult classes. In-service education was an important component of teacher education. Curriculum development was ranked first in importance and funding second. However, funding

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[10]Ibid., p. 386.

showed a significant difference among ranking groups ($p \geq .05$).[11]

From the findings of these conferences, the need to improve agricultural education and strengthen managerial capabilities of farmers in the United States is evident. Increases in agriculture productivity must occur through more effective decision-making capabilities possessed by farmers. This will assist in satisfying the "needs" and "concerns" expressed by the World Food Conference and Conference on Research to Meet United States and World Needs.

Iverson reported that the 1974 National Adult/Young Farmer Seminar encouraged teacher educators of adult vocational agriculture programs to consider and implement the following eight guidelines to counter the decline in adult programs:[12]

1. determine agencies responsible for each phase of the preparation programs,
2. identify competencies necessary for teaching adults,
3. determine minimum professional instruction needed in preparing beginning teachers,

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[11]Bob R. Stewart, William B. Richardson, and Glen C. Shinn, "Identifying Research Concerns of the Agricultural Education Profession," Presented to the American Association of Teacher Educators in Agriculture and National Association of Supervisors of Agricultural Education, December 5, 1976, Houston, Texas, pp. 1-15.

[12]Maynard J. Iverson, "Teacher Education and the Adult Vocational Agriculture Program," The Journal of the American Association of Teacher Educators of Agriculture, Vol. 16, No. 2, (July, 1975), p. 9.

4. determine unique technical training needed by beginning teachers,
5. determine specific and unique field experiences necessary in teacher preparation,
6. develop a program for recruitment of teachers,
7. determine in-service needs of adult/young farmer instructors, and
8. make professional education courses in adult education available to school administrators and staff members.

In "An Approach to Farm Management Education," Boehlje stated that "Increased emphasis on business management concepts in farm management programs is long overdue."[13]

Teacher educators of agricultural education at Virginia Polytechnic Institute and State University are in agreement with the need to improve educational programs for young farmers and adults. They have expressed that just the surface has been scratched in the post-secondary programs and that there is a need for more area and state activities in conjunction with local young farmer groups.[14]

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[13]Michael Boehlje, Vernon Eidman, and Odell Walker, "An Approach to Farm Management Education," American Journal of Agricultural Economics, Vol. 55, No. 2, (May, 1973), pp. 192-197.

[14]"Some Opportunities for Improvement Through Planning" (Virginia Polytechnic Institute and State University, 1975). (Mimeographed.)

TEACHER COMPETENCY OF SUBJECT MATTER

In writing about the competencies needed by teachers of adults, Pankowski stated that:

> It's almost axiomatic that the teacher must have a thorough command of the subject-matter material. The learning theories of Gagné, Ausubel, and Bruner call for subject-matter competence as a prerequisite for effectively designing instruction. These authors see such competence as a necessary condition for facilitating learning . . . .[15]

Pankowski suggested two ways to measure the subject-matter competency of teachers: (1) administer standardized subject-matter tests with minimum levels of performance, and (2) interview teachers using people with expertise in the subject matter.[16]

FEDERAL SUPPORT FOR VOCATIONAL EDUCATION

Early in the nineteenth century, Americans showed little interest in vocational education institutions or programs. The Nation's economy was based primarily on agriculture. The agrarian society seemed indifferent toward "scientific farming" because people believed there was an abundance of seemingly endless natural resources. People involved in education were devoted to liberal arts programs as a means of the general cultural extension and preservation.

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[15]Mary L. Pankowski, "Teachers of Adults Will. . .," Journal of Extension, Vol. 13, (September/October, 1975), p. 8.

[16]Ibid.

By the mid-1800's, socio-economic forces such as the Civil War, Industrial Revolution, and vast population growth were demanding greater production from farmers and industry workers alike. To meet this challenge, Congress submitted the Morrill Act to President Abraham Lincoln in 1862. He believed that the Act would provide needed officers and engineers for the war effort while assisting farmers to increase production. The Morrill Act of 1862 provided:

> . . . to each State a quantity (of land) equal to thirty thousand acres for each senator and representative in Congress to which the States are respectively entitled by the apportionment under the census of eighteen hundred and sixty (for the purpose of establishing) . . . at least one college where the leading objective shall be to . . . teach such branches of learning as are related to agriculture and mechanical arts . . . .[17]

This early legislation had underlining consequences which revamped the Nation's educational system. Venn cited in Man, Education and Work the following notable results:[18]

1. Practical and liberal arts education were present in the same institution.
2. Doors of higher education were opened to a wider public range.
3. Status was given to agriculture and the mechanical arts.
4. Mistrust of education by farmers and businessmen declined.

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[17]U.S. Congress, United States Statues at Large, Vol. 12, 36th-37th Congress, 1860-1863 (Washington: The Library of Congress Photoduplication Service), pp. 503-504.

[18]Grant Venn, Man, Education and Work (Washington: American Council on Education, 1964), p. 45.

5. National economic growth was accelerated by the "new" educational concept.

By the turn of the twentieth century, socio-economic demands from the cities and rural America were intense. The Smith-Lever Act was passed in 1914 which created the Cooperative Extension Service whose mission was to provide solutions to problems of people living in rural areas.

To investigate the continuing socio-economic problems, President Wilson appointed a Commission on National Aid to Vocational Education. Recommendations from the Commission subsequently led to the passing of the Smith-Hughes Act of 1917. The Act appropriated funds for agriculture, trade and industrial education, homemaking, and teacher training in these areas. The Act provided:

> . . . that the controlling purpose of such education shall be to fit for useful employment; that such education shall be of less than college grade and be designated to meet the needs of persons over fourteen years of age who have entered upon or who are preparing to enter upon the work of the farm or of the farm home; that the State or local community, or both, shall provide the necessary plant and equipment determined upon by the State board . . . .[19]

Over the next four and a half decades, vocational education continued to receive federal support which increased funding levels and broadened the number of occupational catagories for training.

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[19]U.S. Congress, United States at Large, Vol. 39, 64th Cong., Part 1, Public Laws (Washington: Government Printing Office, 1917), p. 934.

With the Vocational Education Act of 1963 came new directions for vocational education. The purpose of the Act was to assist States to:

> . . . maintain, extend, and improve existing programs of vocational education, to develop new programs of vocational education, and to provide part-time employment for youths who need the earnings from such employment to continue their vocational training on a full-time basis, so that persons of all ages in all communities of the State--those in high school, those who have completed or discontinued their formal education and are preparing to enter the labor market, those who have already entered the labor market but need to upgrade their skills or learn new ones, and those with special educational handicaps--will have ready access to vocational training or retraining which is of high quality, which is realistic in the light of actual or anticipated opportunities for gainful employment, and which is suited to their needs, interests, and ability to benefit from such training.[20]

Based on the Vocational Act of 1963, the State of Virginia established the following standards and guidelines for conducting young and adult farmer education programs:[21]

Organization

1. The program of young and adult farmer education is a part of the total program of agricultural education. It is an educational opportunity the local departments of vocational agriculture can provide for the

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[20]U.S. Congress, United States at Large, Vol. 77, 88th Cong., 1st Sess., 1963, (Washington: Government Printing Office, 1964), p. 403.

[21]A Planning Guide for Agricultural Education Programs in Virginia's Public Schools (Agricultural Education Service, Division of Vocational Education, State Department of Education, Richmond, Virginia, August, 1969), pp. 33-35.

community through classroom instruction, agricultural mechanics shops, food processing centers, and on-farm instruction.

2. The school community should be surveyed for prospective young and adult farmer class members. The prospective class members should be grouped according to their major farming interests and their degree of establishment in farming such as farm operators, managers, renters, or laborers. A class should be organized with the instructional program being planned for the groups at a level for which the group is capable of working together effectively.
3. It is usually advantageous to arrange separate classes for young farmers as their stage of establishment in farming is frequently different from that of adult farmers.
4. Young farmers often need further development of their leadership activities; to expedite this development many groups have organized local young farmer associations which affiliate with the Young Farmers of Virginia.

Enrollment

1. A bona fide young or adult farmer program will be based upon a minimum enrollment of 10 persons.

2. To be counted as a member of a class, young or adult farmers shall attend at least four meetings during the year and shall be provided four hours of individual on-farm, or on-job instruction.

Over the past decade, states have received increases in funding levels for adult programs. The most noted legislative amendments passed during this period which increased funds for adult programs were the Vocational Amendments of 1968 and the Vocational Amendments of 1976.

RELATED RESEARCH

A study focusing directly upon the level of understanding of farm management principles possessed by vocational agriculture instructors of young farmer classes was not found by the researcher. However, several studies have been conducted to strengthen young farmer programs.

The Matteson and Thompson Study

In 1972 Matteson and Thompson completed research on ". . . why some students continue to attend an educational program for farmers and others drop out."[22] One of the major findings of the study was that students continuing the program found it more relevant to their needs. Also, the study revealed that dropouts were generally

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[22]H. R. Matteson and J. F. Thompson, Why Farmers Persist In or Drop Out of Young Farmer Instructional Programs (Research Division, College of Agriculture and Life Sciences, University of Wisconsin, 1972), p. 3.

older and more established in farming. Reasons for dropping out were mainly of a personal nature. As reported in Table 1, content areas identified by young farmers appropriate for young farmer program instructional units included farm management and agriculture production items. Content areas were ranked according to importance by respondents who drop out and those who continue young farmer classes.

The Webb Study

During the 21st Annual Southern Region Research Conference in Agricultural Education, Dr. Earl S. Webb presented an overview of the "Young Farmer Program Research in Texas." A major purpose of the study was ". . . to identify selected characteristics of advisors of young farmer chapters and to determine the relationship between these characteristics and the level of performance of the chapter."[23]

The findings of the study disclosed that neither the age of the advisors nor the number of graduate school hours completed were significantly associated with the level of performance of the young farmer chapters. Furthermore, neither the number of years that teachers served as advisors to young farmer chapters nor the total number of years of teaching were significantly associated with the level of performance of young farmer chapters.[24]

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[23]Earl S. Webb, "Young Farmer Program Research in Texas," Annual Southern Region Research Conference in Agricultural Education Proceedings, U.S., Educational Resources Information Center, ERIC Document ED 072294, July, 1972, p. 69.

[24]Ibid., pp. 70-71.

Table 1

Importance Respondents Place on
Various Content Areas

Content Area	Drop Out Rank	Continuing Rank
Income Tax	5T*	5T*
Farm Records	4	1T
Soils and Fertilizer	2T	1T
Crop Production	2T	4
Feeds and Feeding	1	1T
Animal Breeding	5T	5T
Farm Buildings	8	8T
Farm Power	9	8T
Weed Control	5T	5T
Insurance	10	10

*T=tied

Source: H. R. Matteson and J. F. Thompson, Why Farmers Persist In or Drop Out of Young Farmer Instructional Programs (Research Division, College of Agriculture and Life Sciences, University of Wisconsin, 1972), p. 8.

The Cauley Study

In the State of Virginia in 1946, Cauley examined the ". . . content of farm management units . . . being taught by teachers of agriculture in high schools."[25] He reported that agriculture instructors desired to teach more farm management units than were being taught. Cauley surveyed 96 white agriculture teachers to find the level of importance placed upon farm management instructional units. Findings of Cauley's study were reported in Table 2.

SUMMARY

The purpose of Chapter II was to explain (1) factors contributing to the need for the study, (2) teacher competency needs, (3) federal support for vocational education, and (4) related research.

The review of literature revealed the importance of agricultural productivity of the United States as an influence to world political stability. Findings from reports of the 1975 President's Council of Economic Advisors: Food and Agriculture, World Food Conference, Conference on Research to Meet United States and World Needs, and American Vocational Association Conference were presented. These findings expressed a need to improve agricultural productivity for the purpose of providing food and fiber for the consumers of the world.

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[25]Virgil B. Cauley, "A Study of Basic Principles of Farm Management," (Unpublished M.S. thesis, Virginia Polytechnic Institute, 1946), p. 1.

Table 2

Ranking of Instructional Units
as Reported by Cauley

Instructional Unit	Rank
Maintaining soil fertility	1
Keeping farm records	2T*
Planning rotations	2T
Farm machinery and equipment	4
Marketing farm products	5
Balancing the farm business	6
Financing the farm business	7
Purpose of farm management	8
Planning the farm layout	9
Analyzing the farm business	10T
Choosing and buying a farm	10T
Farm buildings	10T
Determining size of farm business	13
Drawing up contracts and agreements	14T
Laying out the farmstead	14T
Insuring farm buildings	16
A study of farming types	17
Farm fencing	18
Setting up production goals	19
Farm labor	20T
Insuring crops and livestock	20T

*T=tied

Source: Virgil B. Cauley, "A Study of Basic Principles of Farm Management," (Unpublished M.S. thesis, Virginia Polytechnic Institute, 1946), p. 1.

Pankowski discussed the importance of subject-matter competence by instructors as a necessary condition for facilitating learning. She suggested two ways to measure the subject-matter competency of teachers.

An historical overview of federal support for vocational education was presented. Conditions which led to the passing of the Smith-Hughes Act of 1917 were provided. The Vocational Education Act of 1963 was cited for making federal funds available to adult programs.

The final section of Chapter II identified three studies relating to young farmers and farm management. Matteson and Thompson found that students continued in young farmer programs because it was relevant to their needs. Webb was unable to find a significant association between the advisors' ages, years of teaching, and years of advising young farmer chapters and the level of performance of young farmer chapters. Cauley had 96 vocational agriculture instructors in Virginia identify and rank farm management instructional units to determine the importance placed upon them.

Chapter III

RESEARCH DESIGN AND METHODOLOGY

DESIGN OF THE STUDY

The research design for the study was ex post facto. Kerlinger has defined ex post facto research as:

> . . . that research in which the independent variable or variables have already occurred and in which the researcher starts with the observation of a dependent variable or variables. He then studies the independent variables in retrospect for their possible relations to, and effects on, the dependent variable or variables.[26]

Information about vocational agriculture instructors who taught young farmer classes was sought to analyze the relationship between selected characteristics and the dependent variable, level of understanding of farm management principles. The following independent variables of vocational agriculture instructors were identified:

a. years as owner-manager of a farm enterprise,

b. quarter hour credits of agricultural economics courses,

c. quarter hour credits of business courses,

d. number of non-credit management activities,

e. years of teaching secondary vocational agriculture (grades 10-12),

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[26]Fred N. Kerlinger, Foundations of Behavioral Research (New York: Holt, Rinehart and Winston, Inc., 1964), p. 360.

f. years of teaching pre-secondary vocational agriculture (grades 7-9),

g. years of teaching young farmers or adults,

h. total years of teaching vocational agriculture,

i. age of vocational agriculture instructor,

j. formal education achievement,

k. years as Future Farmers of America member,

l. years as 4-H Club member, and

m. years reared on a farm.

In addition to obtaining information concerning the level of understanding of farm management principles possessed by vocational agriculture instructors, information concerning the ranking of importance of twenty-one farm management instructional units was obtained. Also, the proportion of time allowed for farm management instruction in relation to total time of instruction within young farmer programs was collected.

POPULATION AND SAMPLE

The population identified for this study consisted of the vocational agriculture instructors who taught members of young farmer programs in the State of Virginia. All instructors possessed at minimum a Bachelor's degree from an approved college or university and a certificate to teach in the State of Virginia.

For the school calendar year of 76-77, there was a total of 394 vocational agriculture instructors teaching high school, young

farmer classes and/or adult classes.[27] Of the total number of instructors, 120 had young farmer classes. This group of young farmer instructors comprised the target population at which the study was directed. Names and addresses of vocational agriculture instructors comprising the total population were provided by the Virginia State Department of Education.

From the list of names of vocational agriculture instructors representing the target population, a sample size of 100 instructors was designated; this sample represented 83.3 percent of the total population. This procedure surpassed the criteria for size of sample as outlined by Ary, Jacobs, and Razavieh.

> It is often suggested that one include at least 30 subjects in a sample since this number permits the use of large sample statistics. . . . it is sometimes suggested that one select 10-20 percent of the accessible population for the sample.[28]

Furthermore, they suggested that the larger the sample size, the more likely it is to be representative of the population. Because of the relatively small size of the total population and mail questionnaire technique, the researcher used a larger sample size than recommended. To control for possible extraneous variables of sample subjects affecting the results, randomization was employed.

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[27]Julian M. Campbell, "Agricultural Education High Schools of Virginia and Instructors, 1976-77" (Richmond: State Department of Education, 1977). (Mimeographed.)

[28]Donald Ary, Lucy C. Jacobs, and Asghar Razavieh, Introduction to Research in Education (New York: Holt, Rinehart and Winston, Inc., 1972), p. 167.

The target population was reduced by one member who was a participant in the validation of the standardized test used in the study. The names of all other members of the target population were alphabetized and numbered. The table of random numbers found in Introduction to Research in Education was then used to insure that each member of the population had the same probability of being included in the sample.[29]

DATA COLLECTION INSTRUMENTS

Questionnaire

The questionnaire (Appendix A) was developed as a means of collecting the following data from vocational agriculture instructors who taught young farmer classes:

1. biographic information,
2. ranking of importance of twenty-one farm management instructional units,
3. time allowed for farm management instruction in relation to total time of instruction, and
4. permission to view personal academic records in the Registrar's Office.

The questionnaire was reviewed by a panel of experts (Appendix B) to improve content validity. The panel consisted of four faculty

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[29]Ibid., p. 363.

members and three advanced graduate students from the College of Education at Virginia Polytechnic Institute and State University. Selection of the panel members was based upon their expertise in data instrument construction or course work directed at instrument construction.

The Agribusiness Achievement Test

Resulting from a comprehensive review of literature relating to farm management and testing, the "management" section of The Agribusiness Achievement Test was identified as the instrument to be used to collect data regarding the level of understanding of farm management principles. Developed by Peterson, Harvill, and Horner, the instrument was copyrighted in 1973.[30]

The "management" section of The Agribusiness Achievement Test contains fifty five-option multiple choice items. The instrument requires no longer than forty minutes to read and complete. The items are classified ". . . to give you a means to analyze the areas of strength and weakness . . . ."[31] Item classification of the "management" section follows:[32]

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[30]Roland L. Peterson, Leo M. Harvill, and James T. Horner, The Agribusiness Achievement Test (New York: Houghton Mifflin Company, 1973).

[31]Roland L. Peterson, Leo M. Harvill, and James T. Horner, The Agribusiness Achievement Test: Teacher's and Administrator's Manual (New York: Houghton Mifflin Company, 1973), p. 12.

[32]Ibid., p. 13.

A. Marketing

1. Principles

2. Livestock

3. Crops

4. Trends

5. Methods

B. Records and Analysis

C. Insurance

1. Livestock

2. Crop

3. Life

4. Automobile

D. Credit

E. Farm Law

F. Farm Leases

G. Taxes

H. Management Principles

I. Business Organization.

"The Agribusiness Achievement Test was standardized in April of 1972."[33] In twenty-five states, over five thousand students enrolled in secondary agricultural courses in sixty-three high schools took the test. The midwest (46 percent) and the southeast (27.2 percent)

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[33]Ibid., p. 22.

regions accounted for over 70 percent of the sampling population used for standardization.

Reliability of The Agribusiness Achievement Test for internal consistency was measured using the split-halves reliability coefficient and the standard error of measurement. The reliability coefficient for the "management" section reported for twelfth grade students using split-halves, corrected by Spearman-Brown Formula, was r = .917.[34]

An essential characteristic of any test instrument is that it measures what the evaluator intended it to measure. The degree to which this is accomplished is termed validity. Content validity for the instrument was checked by specialists in farm management. Criterion-related validity determining ". . . the degree to which test results correlate with other variables associated with the area tests . . ."[35] were measured. In Table 3, the intercorrelations among the subtests for twelfth graders were indicated.

The instrument was pilot-tested by fifteen advanced undergraduate students majoring in agricultural education at Virginia Polytechnic Institute and State University. This procedure was used to insure that the instrument's level of difficulty was appropriate for the sample subjects. The mean score of the fifty item test for the pilot group was 36.2. This meant 72.4 percent of the test questions were correctly answered.

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[34]Ibid., p. 24-25.

[35]Ibid., p. 26.

Table 3

Intercorrelations Among the Subtests of
The Agribusiness Achievement Test

	Animal Science	Plant and Soil Science	Mechanics
Plant and Soil Science	.733		
Mechanics	.634	.690	
Management	.960	.735	.672

Source: Roland L. Peterson, Leo M. Harvill, and James T. Horner, The Agribusiness Achievement Test: Teacher's and Administrator's Manual (New York: Houghton Mifflin Company, 1973), p. 26.

DATA COLLECTION PROCEDURE

A letter was sent to Mr. Glenn A. Anderson, Assistant State Supervisor of Agricultural Education, soliciting his support and help in the study (Appendix C). Mr. Anderson responded by providing time and space for administering the data collection instruments to vocational agriculture instructors during the 1977 Annual Convention of Young Farmers of Virginia. The convention was held at the Regency Hyatt House in Richmond, Virginia.

Prior to the convention, each vocational agriculture instructor in the target population was mailed a letter which stated the importance of his participation in the study and informed him of the forthcoming data collection session during the Young Farmers' Convention (Appendix D). From this endeavour, a 19 percent response of the total sample group was obtained on February 5, 1977.

Packets of materials which included a letter from the researcher (Appendix E); the questionnaire; the test instrument; the answer sheet; a No. 2 pencil; and a self-addressed, first class postaged envelope were mailed on February 15, 1977, to sample subjects who had not provided data during the Young Farmers' Convention. After a time lapse of four weeks and one follow-up via phone, a 66 percent usable response was obtained.

To test that the non-respondents (Group 1) were not significantly different from the respondents of the original sample (Group 2), a sample representing 20 percent of the non-respondents was taken on

March 14, 1977. All of the sample subjects in Group 1 responded. The t-test for independent samples was used to determine whether the difference between the means of selected variables was significant at the .05 alpha level. The results of the t-test were located in Table 4. The data indicated that there were no significant differences in the means of selected variables between Group 1 and Group 2. From combining the respondents of Group 1 and Group 2, a 72 percent response was realized.

ANALYSIS OF THE DATA

Compilation of the Data

The questionnaire and the "management" section of The Agribusiness Achievement Test responses were viewed for completion. The test instrument was scored by Learning Resources Center at Virginia Polytechnic Institute and State University.

Data from the questionnaire and scores from the test instrument were transferred to IBM data processing cards and validated by the University Computer Center. In accordance with the Statistical Package for the Social Sciences (SPSS),[36] data definition cards were key punched and added to the data cards for analysis instructions. The University Computing Center was utilized to analyze the data.

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[36]Norman H. Nie, et al., Statistical Package for the Social Sciences (New York: McGraw-Hill Book Company, 1975).

Table 4

The t-test Results of the Two Sample Groups

Variable	Group	Mean	Standard Deviation	Degrees of Freedom	t-value
Years as Owner-Manager of a Farm Enterprise	1*	13.333	11.690	70	1.60***
	2**	6.394	10.027		
Quarter Hour Credits of Agricultural Economics Courses	1	14.083	9.013	68	0.41***
	2	12.719	7.785		
Quarter Hour Credits of Business Courses	1	5.500	10.803	68	-0.26***
	2	6.359	7.292		
Years of Teaching Secondary Vocational Agriculture	1	18.333	11.535	70	1.95***
	2	10.273	9.538		
Years of Teaching Pre-secondary Vocational Agriculture	1	14.167	7.223	69	1.72***
	2	8.015	8.462		
Years of Teaching Young Farmers	1	16.833	10.629	68	1.57***
	2	10.766	8.905		
Total Years of Teaching Vocational Agriculture	1	19.167	10.889	70	1.48***
	2	12.788	10.045		
Age of Instructor	1	43.667	10.893	70	0.97***
	2	38.318	13.080		
Years as FFA Member	1	2.833	2.317	68	-0.53***
	2	3.297	2.005		
Years as 4-H Club Member	1	1.833	2.137	68	-0.60***
	2	2.578	2.975		
Years Reared on a Farm	1	17.600	7.057	67	-0.40***
	2	18.625	5.364		
Agribusiness Test	1	40.667	5.164	70	-0.04***
	2	40.773	5.838		

*Group 1 = respondents of sample follow-up

**Group 2 = respondents of original sample

***Not significant at .05 alpha level

Interpretation of the Data

Descriptive statistics were used to summarize the characteristics of respondents, rank importance of instructional units, and determine time allowed to teach farm management. The descriptive statistics used were frequencies, mean scores, standard deviation, standard error of mean, and percentage scores.

The reliability of the test instrument (dependent variable) was computed using the Kuder-Richardson Formula 20. The reliability coefficient indicated to what extent random errors of measurement influence test scores.

To compare findings against chance expectations through statistical procedures, the research hypotheses found in Chapter I were restated in null form. The null hypotheses were as follows:

$H_0 1$ There is no difference in the level of understanding of farm management principles possessed by vocational agriculture instructors who have no years of experience, one through seven years of experience, or eight or more years of experience as owner-managers of farm enterprises.

$H_0 2$ There is no difference in the level of understanding of farm management principles possessed by vocational agriculture instructors who have taken zero through 6.4 quarter hour credits, 6.5 through 12.4 quarter hour credits, or 12.5 or more quarter hour credits of agricultural economics courses.

$H_0$3 There is no difference in the level of understanding of farm management principles possessed by vocational agriculture instructors who have taken zero through 6.4 quarter hour credits, 6.5 through 12.4 quarter hour credits, or 12.5 or more quarter hour credits of business courses.

$H_0$4 There is no difference in the level of understanding of farm management principles possessed by vocational agriculture instructors who have no years of experience, one through ten years of experience, or eleven or more years experience teaching secondary level vocational agriculture.

$H_0$5 There is no difference in the level of understanding of farm management principles possessed by vocational agriculture instructors who are twenty through twenty-five, twenty-six through thirty-nine, or forty or more years of age.

$H_0$6 There is no difference in the level of understanding of farm management principles possessed by vocational agriculture instructors who possess a Bachelor's degree, a Bachelor's degree plus additional hours, a Master's degree, or a Master's degree plus additional hours.

$H_0$7 There is no difference in the level of understanding of farm management principles possessed by vocational

agriculture instructors who were Future Farmers of America and/or 4-H Club members and those who were not members.

A one-way analysis of variance (ANOVA) was calculated for each of the null hypotheses. Output from the ANOVA program included sources of variance, sum of squares, degrees of freedom, mean squares, and F-ratios. When a null hypothesis was rejected because of the analysis of variance procedure, the Scheffé, a posterior contrast test, was used.

> Scheffé uses a single range value for all comparisons, which is appropriate for examining all possible linear combinations of group means, not just pariwise comparisons. Thus, it is stricter . . . Scheffé is exact, even for unequal group sizes.[37]

The alpha level of .05 was used to test significant differences of variance of group means.

To determine which independent variables influenced vocational agriculture instructors' test scores significantly, the stepwise inclusion multiple regression analysis was used. Simply stated, the purpose of multiple regression is the estimation of the dependent variable from a linear combination of independent variables. The stepwise inclusion enters independent variables one by one into the prediction equation based upon the respective contribution of each variable to explained variance.[38] The general form of the prediction

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[37]Ibid., p. 428.

[38]Ibid., p. 347.

equation for multiple regression analysis follows:

$$Y' = A + B_1X_1 + B_2X_2 + . . . + B_kX_k$$

where

Y' = predicted scores of the dependent variable,

A = intercept constant,

$B_1, B_2, . . ., B_k$ = partial regression coefficients, and

$X_1, X_2, . . ., X_k$ = independent variables.

The stepwise inclusion multiple regression program yielded a correlation matrix, list of variables in the prediction equation, list of residuals, and a summary table. Also present at each step in the regression procedure were the following values:

1. multiple R,
2. R square (coefficient of determination),
3. standard error of estimate,
4. analysis of variance table,
    a. degrees of freedom,
    b. sum of squares,
    c. mean square,
    d. F-ratio,
    e. regression, and
    f. residual.

SUMMARY

Chapter III explained the research design and methodology used in the study. The research design for the study was identified

as ex post facto. The population at which the study was directed consisted of vocational agriculture instructors who taught young farmer classes in the State of Virginia. In 1976-77, there were 120 vocational agriculture instructors conducting young farmer classes.

Data collection instruments for the study were a questionnaire developed by the researcher and the "management" section of The Agribusiness Achievement Test. The questionnaire was used to obtain (1) biographic information, (2) ranking of importance of twenty-one farm management instructional units, and (3) farm management instructional time data. The Agribusiness Achievement Test was used to collect data regarding the level of understanding of farm management principles possessed by vocational agriculture instructors of young farmer classes.

The data collection procedure consisted of administering the data instruments directly to some subjects and mailing packets containing instruments to others. A 72 percent usable response from the sample was obtained.

Analysis of the data was accomplished using the Statistical Package for the Social Sciences. Research hypotheses in Chapter I were restated in null form. Statistics used in the study included descriptive statistics, Kuder-Richardson Formula 20, one-way analysis of variance, Scheffé, and stepwise inclusion multiple regression analysis. The alpha level of .05 was used to test the significance of all hypotheses.

Chapter IV

PRESENTATION AND ANALYSIS OF THE DATA

Chapter IV was comprised of the presentation and analysis of data collected relative to the objectives and hypotheses of the study. The chapter was separated into six sections which included a discussion of biographic information, analysis of the test instrument, analysis of null hypotheses, and multiple regression analysis of instructors' variables on their mean scores on the "management" section of The Agribusiness Achievement Test. In addition, results of the ranking of farm management instructional units and ratio of time allowed for farm management instruction were presented.

BIOGRAPHIC INFORMATION

Data obtained from the questionnaire were catagorized to provide a descriptive overview of the vocational agriculture instructors who participated in the study. A total of seventy-two questionnaires were received. Analysis of biographic data varied from sixty-eight through seventy-two responses due to omitted data by the respondents. Biographic information included age, teaching experience and teaching level, educational achievement, quarter hour credits of agricultural economics courses, quarter hour credits of business courses, FFA and/or 4-H Club membership, owner-managers of farm enterprises, and years reared on a farm.

Age

The data for years of age in Table 5 revealed that twelve instructors (16.67 percent) of the seventy-two respondents were in the twenty through twenty-five years of age group. Twenty-six instructors (36.11 percent) were in the twenty-six through thirty-nine years of age group. The remaining thirty-four instructors (47.22 percent) were forty or more years of age. The mean age for the seventy-two respondents was 38.76 years.

Teaching Experience and Teaching Level

In Table 6, teaching experience and teaching level data were provided. Of seventy-one responses to the years of teaching pre-secondary vocational agriculture question, nine instructors (12.68 percent) had no years of teaching experience. Forty-one instructors (57.75 percent) and twenty-one instructors (29.58 percent) indicated one through ten years and eleven or more years of pre-secondary vocational agriculture teaching experience respectively. Of seventy-two responses to the years of teaching secondary vocational agriculture question, five instructors (6.94 percent) had no years of teaching experience. Thirty-seven instructors (51.39 percent) and thirty instructors (41.67 percent) indicated one through ten years and eleven or more years of secondary vocational agriculture teaching experience respectively. The majority of instructors in both pre-secondary vocational agriculture (57.75 percent) and secondary vocational agriculture (51.39 percent) were in the one through ten years of teaching experience group.

Table 5

Numbers and Percentages of Instructors
by Years of Age

Years of Age	Number of Instructors	Percent of Total Instructors
20 - 25	12	16.67
26 - 39	26	36.11
40 or more	34	47.22
Total	72	100.00

Table 6

Numbers and Percentages of Instructors by Years of Teaching Experience and Teaching Level

Years of Teaching Experience	Pre-secondary Vocational Agriculture		Secondary Vocational Agriculture	
	Number	Percent	Number	Percent
0	9	12.68	5	6.94
1 - 10	41	57.75	37	51.39
11 or more	21	29.58	30	41.67
Total	71	100.01*	72	100.00

*.01 percent due to rounding process

Educational Achievement

The numbers and percentages of instructors by educational achievement level were recorded in Table 7. Four instructors (5.63 percent) of the seventy-one respondents possessed only a Bachelor's degree. Thirty-six instructors (50.70 percent) were in the Bachelor's degree plus additional hours group. In the Master's degree group, there were fifteen instructors (21.13 percent). Sixteen instructors (22.54 percent) possessed a Master's degree plus additional hours. None of the respondents in the study possessed a Doctor's degree.

Quarter Hour Credits of Agricultural Economics Courses

In Table 8, the data were cited regarding the quarter hour credits of agricultural economics courses taken by seventy respondents. Fifteen instructors (21.43 percent) had taken less than 6.5 quarter hour credits of agricultural economics courses. Twenty-four instructors (34.29 percent) had taken 6.5 through 12.4 quarter hour credits of agricultural economics courses, and thirty-one instructors (44.29 percent) had taken 12.5 or more quarter hour credits of agricultural economics courses. The mean for the seventy respondents was 12.84 quarter hour credits of agricultural economics courses.

Quarter Hour Credits of Business Courses

Data in Table 9 revealed that the majority of the seventy respondents (68.57 percent) had taken less than 6.5 quarter hour

Table 7

Numbers and Percentages of Instructors
by Educational Achievement

Educational Achievement	Number of Instructors	Percent of Total Instructors
Bachelor's degree	4	5.63
Bachelor's degree + hours	36	50.70
Master's degree	15	21.13
Master's degree + hours	15	21.13
CAGS* or Educational Specialist	1	1.41
Total	71	100.00

*Certificate of Advanced Graduate Study

Table 8

Numbers and Percentages of Instructors by Quarter Hour Credits of Agricultural Economics Courses

Quarter Hour Credits of Agricultural Economics	Number of Instructors	Percent of Total Instructors
0 - 6.4	15	21.43
6.5 - 12.4	24	34.29
12.5 or more	31	44.29
Total	70	100.01*

*.01 percent due to rounding process

credits of business courses. Of the remaining twenty-two respondents, fourteen instructors (20.00 percent) had taken 6.5 through 12.4 quarter hour credits of business courses, and eight instructors (11.43 percent) had taken 12.5 or more quarter hour credits of business courses. The mean for the seventy respondents was 6.29 quarter hour credits of business courses.

FFA and/or 4-H Club Membership

The data for FFA and/or 4-H Club membership based upon sixty-nine respondents were recorded in Table 10. Only sixteen instructors (23.19 percent) had not been FFA members. The remaining fifty-three instructors (76.81 percent) were in the one through six years of FFA membership group. Twenty-eight instructors (40.58 percent) had not been 4-H Club members. Of the remaining forty-one instructors with 4-H Club membership, eighteen (26.09 percent) were in the one through three years of membership group, sixteen (23.19 percent) were in the four through six years of membership group, and seven (10.14 percent) were in the seven or more years of membership group.

Owner-Managers of Farm Enterprises

As indicated in Table 11, the data disclosed twenty-eight instructors (38.89 percent) of the seventy-two respondents had no experience as owner-managers of farm enterprises. Of the remaining forty-four instructors, twenty (27.78 percent) experienced one through seven years as owner-managers of farm enterprises and twenty-four

Table 9

Numbers and Percentages of Instructors by Quarter Hour Credits of Business Courses

Quarter Hour Credits of Business Courses	Number of Instructors	Percent of Total Instructors
0 - 6.4	48	68.57
6.5 - 12.4	14	20.00
12.5 or more	8	11.43
Total	70	100.00

Table 10

Numbers and Percentages of Instructors by Years of FFA and/or 4-H Club Membership

Years of Membership	FFA Membership		4-H Club Membership	
	Number	Percent	Number	Percent
0	16	23.19	28	40.58
1 - 3	8	11.59	18	26.09
4 - 6	45	65.22	16	23.19
7 or more	0	0.00	7	10.14
Total	69	100.00	69	100.00

(33.33 percent) experienced eight or more years as owner-managers of farm enterprises. The mean years of experience as owner-managers of farm enterprises were 6.97 years.

Years Reared on a Farm

Slightly over 88 percent of the sixty-nine respondents had been reared on a farm fifteen or more years (See Table 12). The remaining eight instructors (11.60 percent) had lived on a farm fourteen years or less.

ANALYSIS OF THE TEST INSTRUMENT

To assess the level of understanding of farm management principles possessed by vocational agriculture instructors of young farmer programs, the "management" section of The Agribusiness Achievement Test was administered. For seventy-two test respondents, the mean test result was 40.72 correct with the maximum possible raw score of fifty. Test scores ranged from sixteen to forty-eight. The standard deviation of number correct was 5.73. Analysis of the test results were recorded in Table 13.

The authors of The Agribusiness Achievement Test presented a content outline which consisted of farm management discipline areas. This outline provided a means to observe strengths and weaknesses of the respondents' knowledge of farm management areas (Appendix F).

Table 11

Numbers and Percentages of Instructors by Years of Experience as Owner-Managers of Farm Enterprises

Years as Owner-Managers of Farm Enterprises	Number of Instructors	Percent of Total Instructors
0	28	38.89
1 - 7	20	27.78
8 or more	24	33.33
Total	72	100.00

Table 12

Numbers and Percentages of Instructors
by Years Reared on a Farm

Years Reared on a Farm	Number of Instructors	Percent of Total Instructors
0 - 7	5	7.25
8 - 14	3	4.35
15 or more	61	88.40
Total	69	100.00

Table 13

Analysis of the Results of the Management Section of The Agribusiness Achievement Test

Number of respondents	72
Mean*	40.72
Standard Deviation*	5.73
Mean**	0.08
Standard Deviation**	0.276
Reliability estimate (KR-20)	0.814
Standard error of measurement	2.472

*based on a possible fifty correct

**based on number omitted

ANALYSIS OF NULL HYPOTHESES

The one-way analysis of variance was used to test the seven null hypotheses. The purpose of an analysis of variance test is to determine if the variance which can be attributed to a variable exceeds the sampling variation by an amount greater than that which may be expected by chance. To retain or reject each null hypothesis, an alpha level of .05 was used.

Analysis related to H_01

The first hypothesis was there would be no difference in the level of understanding of farm management principles possessed by vocational agriculture instructors who had no years of experience, one through seven years of experience, or eight or more years of experience as owner-managers of farm enterprises.

As recorded in Table 14, the F-ratio of .209 indicated there was no significant difference between the mean value scores for years as owner-managers of farm enterprises. The null hypothesis was retained.

Analysis related to H_02

The second hypothesis was there would be no difference in the level of understanding of farm management principles possessed by vocational agriculture instructors who had taken zero through 6.4 quarter hour credits, 6.5 through 12.4 quarter hour credits, or 12.5 or more quarter hour credits of agricultural economics courses.

Table 14

Analysis of Variance for Owner-Managers of Farm Enterprises

Source of Variance	Sum of Squares	Degrees of Freedom	Mean Squares	F-ratio
Between	14.133	2	7.066	.209*
Within	2334.846	69	33.838	
Total	2348.979	71		

*Not significant at the .05 alpha level

A comparison between quarter hour credits of agricultural economics courses and the test scores were presented in Table 15. An F-ratio of .122 was not significant at the .05 alpha level. The null hypothesis was retained.

Analysis related to $H_0 3$

The third hypothesis was there would be no difference in the level of understanding of farm management principles possessed by vocational agriculture instructors who have taken zero through 6.4 quarter hour credits, 6.5 through 12.4 quarter hour credits, or 12.5 or more quarter hour credits of business courses.

In Table 16, the data revealed that a significant difference did exist among the groups for quarter hour credits of business courses and the test scores. An F-ratio of 3.962 was observed which was significant at the .05 alpha level. The null hypothesis was rejected. The Scheffe' revealed that the significant difference between the means of grouped test scores occurred between the 6.5 through 12.4 quarter hour credits group and the 12.5 or more quarter hour credits group.

Analysis related to $H_0 4$

The fourth hypothesis was there would be no difference in the level of understanding of farm management principles possessed by vocational agriculture instructors who have no years of experience, one through ten years of experience, or eleven or more years of experience teaching secondary level vocational agriculture.

The analysis of variance test in Table 17 indicated there

Table 15

Analysis of Variance for Quarter Hour Credits of Agricultural Economics Courses

Source of Variance	Sum of Squares	Degrees of Freedom	Mean Squares	F-ratio
Between	7.707	2	3.854	.122*
Within	2119.271	67	31.631	
Total	2126.978	69		

*Not significant at the .05 alpha level

Table 16

Analysis of Variance for Quarter Hour Credits of Business Courses

Source of Variance	Sum of Squares	Degrees of Freedom	Mean Squares	F-ratio
Between	224.962	2	112.481	3.962*
Within	1902.016	67	28.388	
Total	2126.978	69		

*Significant at the .05 alpha level, location of significant group means bracketed

Quarter Hour Credits of Business Courses	Means
0 - 6.4	41.417
6.5 - 12.4	[37.786
12.5 or more	44.000]

Table 17

Analysis of Variance for Teaching Secondary Level Vocational Agriculture

Source of Variance	Sum of Squares	Degrees of Freedom	Mean Squares	F-ratio
Between	55.422	2	27.711	.834*
Within	2293.556	69	33.240	
Total	2348.978	71		

*Not significant at the .05 alpha level

was not a difference between the groups for teaching secondary level vocational agriculture and the test scores. An F-ratio of .834 was observed. The null hypothesis was retained.

Analysis related to $H_0 5$

The fifth hypothesis was there would be no difference in the level of understanding of farm management principles possessed by vocational agriculture instructors who are twenty through twenty-five, twenty-six through thirty-nine, or forty or more years of age.

In Table 18, the observed F-ratio of .181 indicated there was no significant difference between age groups and the test scores at the .05 alpha level. The null hypothesis was retained.

Analysis related to $H_0 6$

The sixth hypothesis was there would be no difference in the level of understanding of farm management principles possessed by vocational agriculture instructors who possess a Bachelor's degree, a Bachelor's degree plus additional hours, a Master's degree, or a Master's degree plus additional hours.

As shown in Table 19, the F-ratio of 2.318 indicated there was no significant difference between educational achievement groups and the test scores. The null hypothesis was retained.

Analysis related to $H_0 7$

The seventh hypothesis was there would be no difference in the level of understanding of farm management principles possessed by

Table 18

Analysis of Variance for
Age Groups

Source of Variance	Sum of Squares	Degrees of Freedom	Mean Squares	F-ratio
Between	12.281	2	6.141	.181*
Within	2336.698	69	33.865	
Total	2348.979	71		

*Not significant at the .05 alpha level

Table 19

Analysis of Variance for Educational Achievement

Source of Variance	Sum of Squares	Degrees of Freedom	Mean Squares	F-ratio
Between	215.894	3	71.965	2.318*
Within	2079.985	67	31.045	
Total	2295.879	70		

*Not significant at the .05 alpha level

vocational agriculture instructors who were Future Farmers of America and/or 4-H Club members and those who were not members.

The observed F-ratio of 1.322 in Table 20 was not significant at the .05 alpha level. FFA and/or 4-H Club membership had no significant relationship to test scores. The null hypothesis was retained.

MULTIPLE REGRESSION ANALYSIS OF INSTRUCTORS' VARIABLES ON THEIR MEAN SCORE OF THE MANAGEMENT SECTION OF THE AGRIBUSINESS ACHIEVEMENT TEST

The stepwise inclusion multiple regression analysis procedure presented in the Statistical Package for the Social Sciences (SPSS) was used to determine which of the independent variables were most related to the dependent variable, test score. To ensure that partial correlations were computed from the same population, listwise deletion was employed. This analytical option causes " . . . a case to be omitted from the calculation of all coefficients specified in a partial list when that case contains a missing value on any variable entered onto either the correlation or control list."[39] As a result of listwise deletion, sixty-one cases were used in creating the correlation matrix. Independent variables were entered into the prediction equation based upon the following parameter specifications: maximum number of independent variables = 80, F-ratio = .01, and tolerance = .001.

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[39]Norman H. Nie, et al., Statistical Package for the Social Sciences (New York: McGraw-Hill Book Company, 1975), p. 312.

Table 20

Analysis of Variance for FFA and/or
4-H Club Membership

Source of Variance	Sum of Squares	Degrees of Freedom	Mean Squares	F-ratio
Between	44.635	1	44.635	1.322*
Within	2262.169	67	33.764	
Total	2306.804	68		

*Not significant at the .05 alpha level

Data for the matrix of intercorrelation coefficants for the instructors' variables were presented in Table 21. As shown in Table 22, the stepwise inclusion multiple regression analysis of the instructors' variables identified years of teaching pre-secondary vocational agriculture as first in the prediction equation. This was based upon an R square of .1218. The F-ratio for this variable was 5.636 which was significant at the .05 alpha level.

The second variable observed in the prediction equation was age of vocational agriculture instructor. This variable accounted for 10.26 percent of the variation on the dependent variable as indicated from th R square change of .1026. Age of vocational agriculture instructor was significant at the .05 alpha level based upon an observed F-ratio of 8.249.

The third variable identified by the stepwise multiple regression analysis was years of teaching young farmers or adults. This variable increased the R square to .2638, an R square change of .0394. The observed F-ratio of .872 for this variable was not significant at the .05 alpha level.

Years as owner manager of a farm enterprise was the fourth variable to be included into the prediction equation. It had an R square change of .0290 and increased the R square to .2928. An observed F-ratio of 2.606 was not significant at the .05 alpha level.

As presented in Table 22, the remaining nine variables in the prediction equation accounted for a total R square change of .0773. This effect increased the R square total for all variables to .3701.

Table 21

Intercorrelation Coefficants for the Instructors' Variables

		1	2	3	4	5	6	7	8	9	10	11	12	13	14
1	Age of instructor	1.0000	0.8871*	0.8095*	0.6691*	0.8104*	0.2648*	0.0360	0.5375*	0.2926*	0.1588	-0.3251*	0.0584	0.0288	-0.0046
2	Total years of teaching vocational agriculture		1.0000	0.9414*	0.7338*	0.9392*	0.1858	-0.0606	0.4356*	0.2392	0.0693	-0.2262	0.0021	-0.0146	0.1503
3	Years of teaching secondary vocational agriculture			1.0000	0.7400*	0.9274*	0.1605	-0.0653	0.4143*	0.2738*	0.0893	-0.1694	-0.0124	0.0412	0.1527
4	Years of teaching pre-secondary vocational agriculture				1.0000	0.7370*	0.1643	-0.0728	0.4760*	0.2240	0.0532	-0.1210	0.0654	0.1072	0.3490*
5	Years of teaching young farmers or adults					1.0000	0.0668	-0.0386	0.4276*	0.2801*	0.1288	-0.1560	0.0732	0.1238	0.2244
6	Quarter hour credits of agricultural economics courses						1.0000	0.2263	0.1185	-0.0139	0.0110	-0.1177	-0.3210*	-0.1175	0.0238
7	Quarter hour credits of business courses							1.0000	0.1976	-0.1516	0.1317	-0.0093	-0.0890	-0.0150	0.0660
8	Years as owner-manager of a farm enterprise								1.0000	0.0718	-0.1890	-0.3423*	0.1223	0.1219	0.1932
9	Number of non-credit management activities									1.0000	0.3913*	-0.0498	0.1692	-0.0039	-0.0418
10	Formal education achievement										1.0000	0.0289	0.2460	0.0385	-0.0366
11	Years as Future Farmers of America member											1.0000	0.1930	0.1799	0.1925
12	Years as 4-H Club member												1.0000	-0.0409	0.0352
13	Years reared on a farm													1.0000	0.1637
14	Agribusiness test														1.0000

*Significant at the .05 alpha level

Table 22

Stepwise Inclusion Multiple Regression Analysis of Independent Instructors' Variables to Determine Their Mean Score on the Management Section of The Agribusiness Achievement Test

Regression Step	Variables Selected	Multiple R	R Square	R Square Change	F-value
1	Years of teaching pre-secondary vocational agriculture	0.3489	0.1218	0.1218	5.636*
2	Age of instructor***	0.4737	0.2244	0.1026	8.249*
3	Years of teaching young farmers or adults	0.5136	0.2638	0.0394	0.872**
4	Years as owner-manager of a farm enterprise	0.5411	0.2928	0.0290	2.606**
5	Years as Future Farmers of America member	0.5622	0.3161	0.0233	1.426**
6	Years of teaching secondary vocational agriculture	0.5739	0.3293	0.0132	2.068**
7	Quarter hour credits of agricultural economics courses	0.5877	0.3454	0.0161	0.546**
8	Total years of teaching vocational agriculture	0.5971	0.3565	0.0111	1.293**
9	Formal education*** achievement	0.6013	0.3615	0.0050	0.362**
10	Years reared on a farm	0.6045	0.3655	0.0040	0.243**
11	Quarter hour credits of business courses	0.6076	0.3692	0.0037	0.175**
12	Number of non-credit management activities***	0.6081	0.3698	0.0006	0.050**
13	Years as 4-H Club member	0.6084	0.3701	0.0003	0.023**

*Significant at the .05 alpha level

**Not significant at the .05 alpha level

***Denotes negative influence

All but three of the thirteen independent instructors' variables were positive predictors of the test scores. The three negative predictors were age of instructor, formal education achievement, and number of non-credit management activities.

RESULTS OF FARM MANAGEMENT INSTRUCTIONAL UNIT RANKING

To accomplish the objective of determining the ranking of importance of twenty-one farm management instructional units as identified in Cauley's findings of 1946, data were gathered from the questionnaire responses. Data to determine the mean scores and rank order of the farm management instructional units as shown in Table 23 were based upon the following scale: 1 = very high importance, 2 = high importance, 3 = moderate importance, and 4 = relatively low importance. The range of mean scores for the twenty-one farm management instructional units as perceived by the respondents was 1.181 through 3.000.

"Keeping farm records" with a mean score of 1.181 was considered most important of the twenty-one farm instructional units by the seventy-two respondents. The instructional unit perceived as second most important was "maintaining soil fertility" with a mean score of 1.500. Identified as third important was "financing the farm business" with a mean score of 1.556. The fourth, fifth, and sixth important farm management instructional units were "analyzing the farm business," mean score of 1.667; "marketing farm products," mean score of 1.750; and "balancing the farm business," mean score of 1.861 respectively.

Table 23

Rank Order of Farm Management Instructional Units by Seventy-two Instructors

Rank Order	Farm Management Insructional Units	Mean Score*	Standard Deviation
1	Keeping farm records	1.181	0.787
2	Maintaining soil fertility	1.500	0.737
3	Financing the farm business	1.556	1.153
4	Analyzing the farm business	1.667	0.909
5	Marketing farm products	1.750	0.949
6	Balancing the farm business	1.861	0.855
7	Setting up production goals	1.944	0.871
8	Obtaining farm machinery and equipment	2.000	0.729
9	Insuring farm buildings	2.125	0.856
10	Understanding the purpose of farm management	2.153	0.855
11	Drawing up contracts and agreements	2.167	0.422
12	Determining size of farm business	2.181	0.917
13	Planning rotations	2.208	0.605
14	Insuring crops and livestock	2.264	0.746
15	Choosing and buying a farm	2.278	0.751
16	Planning the farm layout	2.514	0.787
17	Employing farm labor	2.542	0.786
18	Obtaining farm buildings	2.667	0.934
19	Laying out the farmstead	2.681	0.748
20	Fencing the farm	2.875	0.993
21	Studying types of farming	3.000	0.914

*Mean score is based upon the following scale: 1 = very high importance, 2 = high importance, 3 = moderate importance, 4 = relatively low importance

ANALYSIS OF TIME ALLOWED FOR FARM MANAGEMENT INSTRUCTION

The proportion of time allowed for farm management instruction in relation to the total time of instruction within young farmer programs was shown in Table 24. The mean proportion of time as indicated by seventy respondents was 25.06 percent with a standard deviation of 21.72. The range of time devoted to farm management instruction was from zero through 80 percent.

SUMMARY

The presentation and analysis of the data were provided in Chapter IV. All analyses were based upon information obtained from administration of the questionnaire and the "management" section of The Agribusiness Achievement Test.

Analysis of biographical information obtained from the questionnaire was presented to provide a descriptive overview of the vocational agriculture instructors who participated in the study. Findings from analysis of the "management" section of The Agribusiness Achievement Test were cited.

Results from testing the null hypotheses using a one-way analysis of variance procedure were furnished. All null hypotheses were tested at the .05 alpha level. Of the seven null hypotheses tested, only one was rejected; the other six were retained. The null hypothesis which was rejected related to the number of quarter hour credits of business courses.

Table 24

Time Allowed for Farm Management Instruction as Indicated by Seventy Instructors

	Percentage of Time
Mean	25.06
Standard deviation	21.72
Standard error of measurement	2.60
Range (minimum)	0.00
Range (maximum)	80.00

Using the stepwise inclusion multiple regression analysis procedure, instructors' independent variables were analyzed to determine which variables were most related to the dependent variable, mean test score. Results of the multiple regression analysis indicated that years of teaching pre-secondary vocational agriculture and age of vocational agriculture instructor accounted for the majority (22 percent) of the 37 percent variance explained by the thirteen variables on the dependent variable. Both of these variables were significant at the .05 alpha level.

Rank order of importance of twenty-one instructional units as perceived by the respondents in the study were presented. Of the first six instructional units identified, five related to the financial aspects of management. The mean proportion of time allowed for farm management instruction within young farmer programs was found to be 25.06 percent.

Chapter V

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

SUMMARY

Problem of the Study

The problem was that the vocational agriculture instructors' level of understanding of farm management principles was unknown.

Purpose of the Study

The purpose of the study was to analyze the level of understanding of farm management principles possessed by vocational agriculture instructors of young farmer programs in the State of Virginia.

Objectives of the Study

The specific objectives of the study were as follows:

1. to assess the level of understanding of farm management principles possessed by vocational agriculture instructors of young farmer programs in the State of Virginia as measured by The Agribusiness Achievement Test;
2. to measure the relationship between vocational agriculture instructors' level of understanding of farm management principles and the following independent variables:

a. years as owner-manager of a farm enterprise,
b. quarter hour credits of agricultural economics courses,
c. quarter hour credits of business courses,
d. number of non-credit management activities,
e. years of teaching secondary vocational agriculture (grades 10-12),
f. years of teaching pre-secondary vocational agriculture (grades 7-9),
g. years of teaching young farmers or adults,
h. total years of teaching vocational agriculture,
i. age of vocational agriculture instructor,
j. formal education achievement,
k. years as Future Farmers of America member,
l. years as 4-H Club member, and
m. years reared on a farm;

3. to determine the ranking of importance of twenty-one farm management instructional units; and
4. to determine the proportion of time allowed for farm management instruction in relation to the total time of instruction within young farmer programs.

Population and Sample

The population for the study was identified as all vocational agriculture instructors who taught members of young farmer programs

in the State of Virginia during the school calendar year of 1976-77. A random sample of 100 instructors was selected to participate in the study. A 72 percent usable response from the sample was obtained.

Data Collection Instruments

Instruments used in the study included a questionnaire and the "management" section of The Agribusiness Achievement Test. The questionnaire was developed by the researcher and reviewed by a panel of experts for content validity. The test instrument contained fifty five-option multiple choice items which were classified to provide a means to analyze areas of strength and weakness of farm management items. Reliability of the test instrument was measured using the split-halves reliability coefficient and the standard error of measurement. The test instrument was pilot-tested to insure that the level of difficulty was appropriate for the sample subjects.

Data Collection Procedure

The data collection procedure consisted of administering the questionnaire and test instrument to part of the sample subjects during the 1977 Annual Convention of Young Farmers of Virginia. Packets containing data collection materials and a letter from the researcher were mailed to sample subjects who did not provide data during the Convention.

Analysis of the Data

Interpretation of the data was accomplished using descriptive

statistics to summarize the characteristics of the sample respondents, determine ranking of farm management instructional units, and determine the proportion of time allowed for farm management instruction. A one-way analysis of variance (ANOVA) was used to test the null hypotheses for significant differences of variance of group means. The alpha level of .05 was used to test the significance of all null hypotheses. To determine which independent variables were most related to the test instrument score, the stepwise inclusion multiple regression analysis procedure presented in the Statistical Package for the Social Sciences (SPSS) was used.

Null Hypotheses

The following null hypotheses were developed and tested for significance:

$H_0 1$ There is no difference in the level of understanding of farm management principles possessed by vocational agriculture instructors who have no years of experience, one through seven years of experience, or eight or more years of experience as owner-managers of farm enterprises.

$H_0 2$ There is no difference in the level of understanding of farm management principles possessed by vocational agriculture instructors who have taken zero through 6.4 quarter hour credits, 6.5 through 12.4 quarter hour credits, or 12.5 or more quarter hour credits of agricultural economics courses.

$H_0 3$ There is no difference in the level of understanding of farm management principles possessed by vocational agriculture instructors who have taken zero through 6.4 quarter hour credits, 6.5 through 12.4 quarter hour credits, or 12.5 or more quarter hour credits of business courses.

$H_0 4$ There is no difference in the level of understanding of farm management principles possessed by vocational agriculture instructors who have no years of experience, one through ten years of experience, or eleven or more years experience teaching secondary level vocational agriculture.

$H_0 5$ There is no difference in the level of understanding of farm management principles possessed by vocational agriculture instructors who are twenty through twenty-five, twenty-six through thirty-nine, or forty or more years of age.

$H_0 6$ There is no difference in the level of understanding of farm management principles possessed by vocational agriculture instructors who possess a Bachelor's degree, a Bachelor's degree plus additional hours, a Master's degree, or a Master's degree plus additional hours.

$H_0 7$ There is no difference in the level of understanding of farm management principles possessed by vocational

agriculture instructors who were Future Farmers of America and/or 4-H Club members and those who were not members.

Findings of the Study

The analysis of the biographical data of the vocational agriculture instructors who participated in the study revealed that the average instructor of young farmers was 38.76 years old and had nearly seven years of experience as owner-manager of a farm enterprise. Over 40 percent of the instructors possessed at minimum a Master's degree. The average quarter hour credits of agricultural economics and business courses taken by the instructor was 12.84 and 6.29 respectively.

Nearly 60 percent of the instructors had been members of the Future Farmers of America and/or 4-H Club. Sixty-seven instructors (93.06 percent) had experience teaching secondary level vocational agriculture.

The "management" section of The Agribusiness Achievement Test was used to assess the level of understanding of farm management principles possessed by vocational agriculture instructors of young farmers. For the seventy-two respondents, the mean test result was 40.72 correct with the maximum possible raw score of fifty. Test scores ranged from sixteen through forty-eight. The standard deviation of the number correct was 5.73.

Seven null hypotheses were tested at the .05 alpha level using a one-way analysis of variance (ANOVA). Analysis of data revealed that $H_0 1$, $H_0 2$, $H_0 4$, $H_0 5$, $H_0 6$, and $H_0 7$ were retained; $H_0 3$ was rejected based upon an F-ratio of 3.962. The third null hypothesis was that there would be no difference in the level of understanding of farm management principles possessed by vocational agriculture instructors who have taken zero through 6.4 quarter hour credits, 6.5 through 12.4 quarter hour credits, or more than 12.5 quarter hour credits of business courses. However, the difference between the test means occurred between the 6.5 through 12.4 quarter hour credits group and the 12.5 or more quarter hour credits group.

To determine which of the independent instructor variables were most related to the dependent variable, test score, the stepwise inclusion multiple regression analysis procedure presented in the Statistical Package for the Social Sciences (SPSS) was used. Years of teaching pre-secondary vocational agriculture was selected as being most related to the test score. This discovery was based upon an R square of .1218. The observed F-ratio of 5.636 was significant at the .05 alpha level. Age of vocational agriculture instructor, a negative predictor, was selected second most related to the test score. It had an R square change of .1026 and was significant at the .05 alpha level with an F-ratio of 8.249. The remaining eleven independent instructor variables accounted for 14.57 percent of the variance of the dependent variable, test score. None of these variables were significant at the .05 alpha level.

Analysis of the mean scores of the importance of the twenty-one farm management instructional units as perceived by the respondents revealed five of the six most important instructional units were related to financial topics of management. These five instructional units were keeping farm records, financing the farm business, analyzing the farm business, marketing farm products, and balancing the farm business.

The proportion of time allowed for farm management instruction in relation to the total time of instruction within young farmer programs was discovered to be 25.06 percent. The time range was from zero to 80 percent.

CONCLUSIONS

Conclusions developed by the researcher were based upon the interpretations of the data in the study. The reader should be cognizant of the fact that responses were obtained from the 1976-77 vocational agriculture instructors who taught young farmers in the State of Virginia. Generalizations of the results are further limited by reliability and validity of the questionnaire and test instrument.

Conclusions for the study were as follows:

1. The level of understanding of farm management principles possessed by vocational agriculture instructors of young farmer programs in the State of Virginia as measured by The Agribusiness Achievement Test was found to be 81 percent. This researcher considers this percent low.

2. There tends to be no significant difference between the number of years of experience as owner-managers of farm enterprises by vocational agriculture instructors and their level of understanding of farm management principles.
3. There tends to be no significant difference between the number of quarter hour credits of agricultural economics courses taken by vocational agriculture instructors and their level of understanding of farm management principles.
4. There tends to be a significant difference between the number of quarter hour credits of business courses taken by vocational agriculture instructors and their level of understanding of farm management principles.
5. There tends to be no significant difference between the number of years of secondary level vocational agriculture teaching experience by vocational agriculture instructors and their level of understanding of farm management principles.
6. There tends to be no significant difference between the age of the vocational agriculture instructors and their level of understanding of farm management principles.
7. There tends to be no significant difference between the formal educational achievement of the vocational agriculture instructors and their level of understanding of farm management principles.

8. There tends to be no significant difference between former Future Farmers of America and/or 4-H Club membership by vocational agriculture instructors and their level of understanding of farm management principles.
9. A significant proportion of the variance in the vocational agriculture instructors' level of understanding of farm management principles was accounted for by the combination of the variables (1) years of teaching pre-secondary vocational agriculture and (2) age of instructor. However, age of the instructor resulted in a negative correlation with the dependent variable, test score. This indicates that the older the instructor, the lower the test score.
10. No significant proportion of the variance in the vocational agriculture instructors' level of understanding of farm management principles was accounted for by the combination of the following variables:
    a. years of teaching young farmers or adults,
    b. years as owner-manager of a farm enterprise,
    c. years as Future Farmers of America member,
    d. years of teaching secondary vocational agriculture,
    e. quarter hour credits of agricultural economics courses,
    f. total years of teaching vocational agriculture,
    g. formal education achievement,
    h. years reared on a farm,

i. quarter hour credits of business courses,

j. number of non-credit management activities, and

k. years as 4-H Club member.

11. Financial topics were perceived by Virginia vocational agriculture instructors as being the most important aspect of farm management instruction within young farmer programs.

12. Virginia vocational agriculture instructors devoted approximately a quarter of the young farmer program teaching time to farm management instruction.

RECOMMENDATIONS

From the findings of the study, the following recommendations were generated:

1. Further studies should be conducted to assess what level of competence should be possessed by vocational agriculture instructors who teach young farmers.

2. Virginia teacher educators should advise prospective vocational agriculture instructors of young farmers to include business courses in their program of studies.

3. A study should be conducted to determine the extent to which vocational agriculture instructors of Virginia young farmers are incorporating the most important of the twenty-one farm management instructional units into young farmer programs.

4. A study should be conducted to determine the importance of farm management instructional units as perceived by Virginia young farmer program participants and the results compared to the findings of this study for congruency.
5. This study should be replicated in other states where young farmer programs exist and the results compared with those of this study. In replication, additional variables of instructors should be studied such as grade point average.

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APPENDICES

APPENDIX A

QUESTIONNAIRE FOR AGRICULTURAL INSTRUCTORS WHO TEACH YOUNG FARMER CLASSES IN VIRGINIA

QUESTIONNAIRE FOR AGRICULTURAL INSTRUCTORS
WHO TEACH YOUNG FARMER CLASSES
IN VIRGINIA

* * * Confidential Information * * *

Information obtained from this questionnaire will be used for the sole purpose of strengthening farm management instruction for young farmers. No reference will ever be made regarding an individual's response to any question within the questionnaire or Achievement Test.

Please fill in all blanks to the best of your ability. If the answer is "zero," please indicate so.

_____ _____
NAME AGE

I. Please indicate the number of years teaching experience to include the present year for the following catagories:

_____ Total years of teaching vocational agriculture.

_____ Years of teaching vocational agriculture, grades 10-12.

_____ Years of teaching vocational agriculture, grades 7-9.

_____ Years of teaching young or adult farmer classes.

II. Number of undergraduate and graduate credit hours of agricultural economics courses taken:

_____ _____
Semester Hrs. Quarter Hrs.

III. Number of undergraduate and graduate credit hours of business courses taken, that is, courses taken in a college or university for credit providing general knowledge of business principles and practices, e.g. accounting, management, business law.

_____ _____
Semester Hrs. Quarter Hrs.

IV. Have you ever been or are you now an owner-manager of a farm enterprise? A farm enterprise is a unit of economic organization devoted to raising animals and/or crops for profit.

1._____ 2._____ If "yes,"
YES NO how many years?_____

V. Have you participated in non-credit management activities? Such activities would consist of a learning experience or occupational experience whereby the process of planning, directing, and evaluating leads to the accomplishment of an objective, e.g. workshop, conference.

1. _____ YES 2. _____ NO If "yes," how many?_____

VI. Please place an "X" by the number that represents your highest educational attainment.

_____ 1. Bachelor's degree

_____ 2. Bachelor's degree plus additional hours

_____ 3. Master's degree

_____ 4. Master's degree plus additional hours

_____ 5. Certificate of Advanced Graduate Study or Educational Specialist

_____ 6. Other, please indicate. _____

VII. Were you ever a member of the Future Farmers of America?

1._____ YES 2._____ NO If "yes," how many years?_____

VIII. Were you ever a member of the 4-H Club?

1._____ YES 2._____ NO If "yes," how many years?_____

IX. Were you reared on a farm?

1._____ YES 2._____ NO If "yes," how many years did you live on the farm?_____

X. Please indicate the percent of time allowed for farm management instruction in relation to the total time of instruction within your young farmer program.

_____%

3

Please place the appropriate number on the blank which indicates the importance that you place upon the following farm management instructional units when teaching young farmers.

1 = VERY HIGH IMPORTANCE
2 = HIGH IMPORTANCE
3 = MODERATE IMPORTANCE
4 = RELATIVELY LOW IMPORTANCE

Instructional Units

_____ Analyzing the farm business

_____ Balancing the farm business

_____ Choosing and buying a farm

_____ Determining size of farm business

_____ Drawing up contracts and agreements

_____ Employing farm labor

_____ Fencing the farm

_____ Financing the farm business

_____ Insuring crops and livestock

_____ Insuring farm buildings

_____ Keeping farm records

_____ Laying out the farmstead

_____ Maintaining soil fertility

_____ Marketing farm products

_____ Obtaining farm buildings

_____ Obtaining farm machinery and equipment

_____ Planning rotations

_____ Planning the farm layout

_____ Setting up production goals

_____ Studying types of farming

_____ Understanding the purpose of farm management

I, _____, give Steven J. Rumpf
(Print your name)

permission to view my personal academic record in the registrar's office of (VPI & SU or Virginia State College). I understand this
(Circle School)

viewing is for an approved research endeavor.

_____
Signature

_____
Social Security Number

_____
Date

APPENDIX B

PANEL OF EXPERTS

FACULTY

Dr. Curtis R. Finch, Professor
Division of Vocational and Technical Education
College of Education
Virginia Polytechnic Institute and State University

Dr. John R. Crunkilton, Associate Professor
Agricultural Education
Division of Vocational and Technical Education
College of Education
Virginia Polytechnic Institute and State University

Dr. Martin B. McMillion, Associate Professor
Agricultural Education
Division of Vocational and Technical Education
College of Education
Virginia Polytechnic Institute and State University

Dr. Larry J. Weber, Professor
Division of Curriculum and Instruction
College of Education
Virginia Polytechnic Institute and State University

ADVANCED GRADUATE STUDENTS

Mr. Thomas A. Lozito
Doctoral Candidate
Division of Vocational and Technical Education
College of Education
Virginia Polytechnic Institute and State University

Mr. William G. Neal
Graduate Research Assistant
Division of Vocational and Technical Education
College of Education
Virginia Polytechnic Institute and State University

Mr. Jack L. Schinstock
Graduate Teaching Assistant
Division of Vocational and Technical Education
College of Education
Virginia Polytechnic Institute and State University

APPENDIX C

LETTER FOR SUPPORT OF THE RESEARCH ENDEAVOUR

COLLEGE OF EDUCATION

VIRGINIA POLYTECHNIC INSTITUTE AND STATE UNIVERSITY

Blacksburg, Virginia 24061

DIVISION OF VOCATIONAL & TECHNICAL EDUCATION

January 10, 1977

Mr. Glenn A. Anderson
Assistant State Supervisor
Agricultural Education
State Department of Education
Richmond, Virginia

Dear Mr. Anderson:

This letter is a follow-up to our phone conservations regarding research for the improvement of farm management instruction of Virginia young farmers. To accomplish this goal, I plan to assess the level of understanding of farm management principles possessed by vocational agriculture instructors of Virginia young farmer programs.

As you will recall from our conservations, I plan to collect the data for analysis from a questionnaire and a standardized test during the Annual Convention of the Young Farmers' of Virginia, February 1977. Would you please arrange for me one hour of time on the convention agenda and a room to administer the data gathering instruments to the vocational agriculture instructors.

Also, I would like a letter of endorsement from you by February 1st for this research endeavor addressed to the vocational agriculture instructors of young farmer programs. I plan to duplicate the letter and enclose it with the data gathering instruments which will be mailed to those instructors who do not attend the Annual Convention.

I sincerely appreciate your assistance and am looking forward to working with you in improving Virginia's agricultural education program.

Sincerely,

Steven J. Rumpf

cc: Mr. Julian Campbell

APPENDIX D

LETTER TO VOCATIONAL AGRICULTURE INSTRUCTORS WHO TEACH YOUNG FARMERS IN VIRGINIA

COLLEGE OF EDUCATION

VIRGINIA POLYTECHNIC INSTITUTE AND STATE UNIVERSITY

Blacksburg, Virginia 24061

DIVISION OF VOCATIONAL & TECHNICAL EDUCATION

January 25, 1977

As an agricultural teacher, you provide the key to success of Virginia's young farmer instructional programs. The farm management instruction that you furnish may well be responsible for assisting young people to become established in farming and to improve their economic status.

Regardless of your experience in teaching young farmer classes, your responses in answering questions about farm management principles and about yourself could contribute to the improvement of farm management instruction in Virginia. As partial requirement for a Ed.D. degree at VPI & SU, I am performing a research project in this area. The findings will be of practical interest to all current and future agricultural teachers of young farmers in Virginia, as well as providing direction for in-service education needs of agricultural teachers.

On Saturday, February 5, 1977, during the Annual Convention of the Young Farmers' of Virginia; a room has been reserved at the Richmond Hyatt House for us to meet and collect data for the research. Information obtained from the questions will be used for the sole purpose of strengthening farm management instruction and no reference will ever be made regarding an individual's responses. All materials needed during this one hour session will be furnished.

Looking forward to meeting you on February 5, 1977, and working with you toward improving Virginia's agricultural education program for young farmers.

Sincerely,

Steven J. Rumpf

Let me add my support for this project and encourage you to participate. Findings from such a study will certainly provide insight as to in-service needs of teachers in the area of farm management instruction and also aid us at Virginia Tech in advising undergraduates in course selection.

Sincerely,

John R. Crunkilton, Associate Professor
Agricultural Education

APPENDIX E

LETTER TO VOCATIONAL AGRICULTURE INSTRUCTORS INCLUDED IN DATA COLLECTION PACKET

COLLEGE OF EDUCATION

VIRGINIA POLYTECHNIC INSTITUTE AND STATE UNIVERSITY

Blacksburg, Virginia 24061

DIVISION OF VOCATIONAL & TECHNICAL EDUCATION

From my first letter dated January 25, 1977, you will recall that I am conducting research to contribute to the improvement of farm management instruction for young farmers in Virginia.

Regardless of your experience in teaching young farmers, your responses in answering questions about farm management principles and about yourself are critical to the success of this study. Information obtained from the questions will be used for the sole purpose of strengthening farm management instruction and no reference will ever be made regarding an individual's responses.

Please answer all questions on the "Questionnaire for Agricultural Instructors," and use the "General Purpose - NCS - Answer Sheet" to record your answers from The Agribusiness Achievement Test. A No. 2 pencil is enclosed. When completed, please mail the "Questionnaire for Agricultural Instructors," the "General Purpose - NCS - Answer Sheet," and The Agribusiness Achievement Test in the self-addressed, stamped envelope by Tuesday, February 22, 1977.

Sincerely,

Steven J. Rumpf

Let me add my support for this project and encourage you to participate. Findings from such a study will certainly provide insight as to in-service needs of teachers in the area of farm management instruction and also aid us at Virginia Tech in advising undergraduates in course selection.

Sincerely,

John R. Crunkilton, Associate Professor
Agricultural Education

APPENDIX F

CONTENT ANALYSIS BREAKOUT OF THE MANAGEMENT SECTION OF THE AGRIBUSINESS ACHIEVEMENT TEST

Content Analysis Breakout of the Management Section
of The Agribusiness Achievement Test

Item	Questions Per Item	Mean*	Percent
Marketing	(10)**	(61.1)**	(84.9)**
Principles	4	58.0	80.6
Livestock	2	66.5	92.4
Crops	1	71.0	98.6
Trends	1	61.0	84.7
Methods	2	49.0	68.0
Record & Analysis	7	56.9	79.0
Insurance	(5)**	(55.9)**	(77.6)**
Livestock	2	66.5	92.4
Crop	1	46.0	63.9
Life	1	51.0	70.8
Automobile	1	60.0	83.3
Credit	4	60.8	84.4
Farm Law	2	61.5	85.4
Farm Leases	2	56.0	77.8
Taxes	4	59.0	81.9
Management Principles	14	58.4	81.1
Business Organization	2	58.5	81.2
Total	50		81.5

*Mean per item of correct responses by 72 instructors

**Average of subtopics

VITA

Steven Joseph Rumpf was born to Mr. and Mrs. Fredrick J. Rumpf on September 8, 1945 in Philadelphia, Pennsylvania. He attended public schools in Bucks County, Pennsylvania, and Orange County, Florida. Mr. Rumpf received the Associate of Arts degree from Orlando Junior College in January 1965 and entered the University of Florida in May of that year. He graduated from the University of Florida with the Bachelor of Science in Agriculture degree on June 11, 1968.

Following college, Mr. Rumpf entered the United States Army; upon completion of Infantry Officer Candidate School, he was commissioned a Second Lieutenant. During the next six months, he served as a Company Training Officer of new recruits at Ft. Benning, Georgia. In Viet-Nam, First Lieutenant Rumpf served with the First Calvary Division as a Pathfinder Detachment Commander providing navigational assistance and control to Army aircraft.

Upon completion of active military service, Mr. Rumpf joined Gold Kist Eggs located in Hilliard, Florida. While employed with Gold Kist Eggs, he was responsible for developing and implementing management systems to aid in the processing of 12,000 cases of eggs per week.

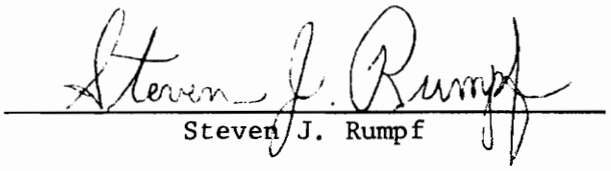
During the period August 1972 through June 1975, Mr. Rumpf was an instructor of vocational agriculture and advisor for the Future Farmers of America organization at West Nassau County High School in Callahan, Florida. Also, during this period, he worked toward a

Master's degree at the University of Florida. In August of 1975, he received the Master of Agriculture degree.

In September of 1975, Mr. Rumpf was awarded the Education Professional Development Act fellowship and entered the Virginia Polytechnic Institute and State University, Blacksburg, Virginia. Over the next two years at Virginia Tech, he pursued the Doctor of Education degree in Vocational and Technical Education.

Mr. Rumpf is active in many educational and agricultural organizations. He is a member of Phi Kappa Phi, Gamma Sigma Delta, Alpha Tau Alpha, Phi Delta Kappa, and numerous other professional organizations.

On May 20, 1967, Mr. Rumpf married the former Alice Elizabeth Hedges of Winter Park, Florida. They have two sons Christopher Steven, born August 6, 1974, and Daniel Joseph, born June 24, 1977.



Steven J. Rumpf

THE LEVEL OF UNDERSTANDING OF FARM MANAGEMENT PRINCIPLES POSSESSED BY VOCATIONAL AGRICULTURE INSTRUCTORS OF VIRGINIA YOUNG FARMER PROGRAMS

by

Steven Joseph Rumpf

(ABSTRACT)

The purpose of the study was to analyze the level of understanding of farm management principles possessed by vocational agriculture instructors of young farmer programs in the State of Virginia.

Specific objectives of the study were (1) to assess the level of understanding of farm management principles possessed by vocational agriculture instructors of Virginia young farmer programs, (2) to measure the relationship between variables of instructors and their level of understanding of farm management principles, (3) to determine the ranking of importance of twenty-one farm management instructional units, and (4) to determine the proportion of time allowed for farm management instruction in relation to the total time of instruction within young farmer programs.

A 72 percent usable response was realized from the randomly selected sample which constituted data input for the study. Data collection instruments included a questionnaire developed by the researcher and the "management" section of The Agribusiness Achievement Test. The data collection procedure consisted of administering the

questionnaire and test instrument to part of the sample subjects during the 1977 Virginia Young Farmers' Convention and mailing packets of data collection material to sample subjects who did not provide data during the Convention.

Analysis of the data was accomplished using the following statistics: descriptive statistics, a one-way analysis of variance (ANOVA) to test null hypotheses for significance, and a stepwise inclusion multiple regression to determine which variables of the instructors were most related to their level of understanding of farm management principles.

Of seven null hypotheses tested at the .05 alpha level, only one was rejected. The rejected null hypothesis was that there would be no difference in the level of understanding of farm management principles possessed by vocational agriculture instructors who have taken zero through 6.4 quarter hour credits, 6.5 through 12.4 quarter hour credits, or more than 12.5 quarter hour credits of business courses. However, the difference between the test means occurred between the 6.5 through 12.4 quarter hour credits group and the 12.5 or more quarter hour credits group.

Years of teaching pre-secondary vocational agriculture and age of instructor, a negative predictor, were independent variables most related to the vocational agriculture instructors' level of understanding of farm management principles. Both of these variables were significant at the .05 alpha level.

In ranking the importance of twenty-one farm management instructional units, Virginia vocational agriculture instructors identified financial topics as being the most important aspects of farm management instruction. Approximately a quarter of the time allowed for instruction within young farmer programs was devoted to teaching farm management.

Recommendations generated from the findings of the study were (1) further studies should be conducted to assess what level of competence should be possessed by vocational agriculture instructors who teach young farmers, (2) advise prospective vocational agriculture instructors of young farmers to enroll in business courses, (3) conduct a study to determine the extent to which the twenty-one farm management instructional units are being taught in Virginia young farmer programs, (4) conduct a study to determine the importance of farm management instruction units as perceived by young farmer program participants, and (5) replicate this study in other states and compare results with those of this study.