

R E P O R T R E S U M E S

ED 019 464

VT 002 984

SUMMARIES OF STUDIES IN AGRICULTURAL EDUCATION, AN ANNOTATED BIBLIOGRAPHY OF STUDIES IN AGRICULTURAL EDUCATION WITH CLASSIFIED SUBJECT INDEX. SUPPLEMENT NO. 16, VOCATIONAL DIVISION BULLETIN NO. 180, AGRICULTURAL SERIES NO. 80. OFFICE OF EDUCATION (DHEW), WASHINGTON, D.C.

REPORT NUMBER OE-81002-63

PUB DATE

65

EDRS PRICE MF-\$0.50 HC NOT AVAILABLE FROM EDRS. 75P.

DESCRIPTORS- \*AGRICULTURAL EDUCATION, \*MASTERS THESES, \*DOCTORAL THESES, \*ANNOTATED BIBLIOGRAPHIES, \*EDUCATIONAL RESEARCH,

THE 144 STUDIES ARE CATEGORIZED UNDER THE TOPICS--ADMINISTRATION, GUIDANCE, INSTRUCTION, AND TEACHER EDUCATION. EACH HAS BEEN PUBLISHED OR IS AVAILABLE ON LOAN FROM A UNIVERSITY LIBRARY OR STATE DEPARTMENT OF EDUCATION AS INDICATED IN THE LISTING. TWENTY ARE STAFF STUDIES, 42 ARE DOCTORAL DISSERTATIONS, AND 82 ARE MASTER'S THESES IN WHICH THE INFERENCES DRAWN ARE APPLICABLE TO AREAS OR REGIONS BROADER THAN LOCAL COMMUNITIES. THIS SUPPLEMENT OF THE PROJECT BEGUN IN 1932 REPRESENTS PARTICIPATION OF AN INCREASED NUMBER OF STATES AND UNIVERSITIES, AND CONSTRUCTION OF MORE STUDIES ON AN EXPERIMENTAL DESIGN OR ON PROBABILITY SAMPLING SURVEYS. A CLASSIFIED INDEX OF THE STUDIES IS INCLUDED. THIS DOCUMENT IS AVAILABLE AS FS5.281--81002-63 FOR 30 CENTS FROM SUPERINTENDENT OF DOCUMENTS, U.S. GOVERNMENT PRINTING OFFICE, WASHINGTON, D.C. 20402. (WB)

OE-81002-63

ED019464

# Summaries of studies in agricultural education

**An annotated bibliography of studies  
in agricultural education with  
classified subject index**

**Supplement No. 16**

**Vocational Division Bulletin No. 180  
Agricultural Series No. 80**

VT 02984

**U.S. DEPARTMENT OF  
HEALTH, EDUCATION, AND WELFARE  
Office of Education**

U.S. DEPARTMENT OF HEALTH, EDUCATION & WELFARE  
OFFICE OF EDUCATION

THIS DOCUMENT HAS BEEN REPRODUCED EXACTLY AS RECEIVED FROM THE  
PERSON OR ORGANIZATION ORIGINATING IT. POINTS OF VIEW OR OPINIONS  
STATED DO NOT NECESSARILY REPRESENT OFFICIAL OFFICE OF EDUCATION  
POSITION OR POLICY.

OE-81002-63

# Summaries of studies in agricultural education

**An annotated bibliography of studies  
in agricultural education with  
classified subject index**

**Supplement No. 26 to Vocational Division  
Bulletin No. 180, Prepared by the Research  
Committee of the Agricultural Education  
Section, American Vocational Association**

**Vocational Division  
Bulletin No. 180**

**Agricultural  
Series No. 80**

**U.S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE**  
Anthony J. Celebrezze, *Secretary*  
**OFFICE OF EDUCATION**  
Francis Keppel, *Commissioner*

**Superintendent of Documents Catalog No. FS 5.261:81002-63**

**U.S. GOVERNMENT PRINTING OFFICE  
WASHINGTON : 1965**

---

**For sale by the Superintendent of Documents, U.S. Government Printing Office  
Washington, D.C., 20402 - Price 30 cents**

# Contents

---

	<b>Page</b>
<b>Foreword.....</b>	<b>V</b>
<b>Introductory Statement.....</b>	<b>1</b>
<b>Summaries of New Studies, 1961-63.....</b>	<b>3</b>
<b>Classified Index of Studies.....</b>	<b>71</b>

## Foreword

---

In 1932 the American Vocational Association, in cooperation with the Agricultural Education Branch of the U.S. Office of Education, initiated a project to make available summaries of numerous studies in agricultural education, many of them unpublished but deposited in college or university libraries. The first publication resulting from this project was Vocational Education Bulletin No. 180, *Summaries of Studies in Agricultural Education*, issued by the Office of Education in 1935. The project has been continued through the issuing of supplements to Bulletin No. 180. This current publication, Supplement No. 16, extends the project through the 1961-62 and 1962-63 academic years.

Research in vocational education in agriculture has become increasingly more important in recent years. Evaluation of current programs and determination of present and future needs are essential if vocational agriculture is to serve effectively in a rapidly changing agricultural economy.

It is hoped that the studies summarized in this publication will be used for continued improvement of the program and will stimulate additional investigations. Persons desiring more detail on a particular study may wish to consult the original manuscript or publication available at the source indicated in the summary.

WALTER M. ARNOLD,  
*Assistant Commissioner*  
*for Vocational and Technical Education.*

▼

# Summaries of Studies in Agricultural Education

## Introductory Statement

The 144 studies included in Supplement No. 16 bring the total number reported to 3,248. They represent investigations of problems of great concern to vocational and technical education, and meet high standards of quality of research. They have utilized appropriate and adequate designs, applied suitable procedures, involved sufficient data effectively summarized, and resulted in justifiable conclusions. Each study has been published or is available on loan from a university library or State department of education, as indicated in the listing. Twenty are staff studies, 42 are doctoral dissertations, and 82 are master's theses in which inferences are drawn applicable to areas or regions broader than local communities.

Members of the American Vocational Association, working with the Research Committee of the Agricultural Division, have assisted in the work of preparing, editing, and assembling the summaries. An increase in the number of States and universities contributing to this publication has been noted. More studies have used experimental design or have been built on probability sampling surveys. It is hoped that progress also has been made in contributing to broader aspects of research that is valuable in interrelated programs of public school education for employment.

### Research Committee of the Agricultural Division of the American Vocational Association

GLENN Z. STEVENS, The Pennsylvania State University, *Chairman*  
GORDON I. SWANSON, University of Minnesota, *Secretary*  
JAMES D. McCOMAS, New Mexico State University  
EARL S. WEBB, Texas A. & M. University  
HAROLD R. CRAWFORD, NVATA, Sac City, Iowa  
DUANE M. NIELSEN, U.S. Office of Education

Former members of the committee (1962-64):

GEORGE L. O'KELLEY, Jr., University of Georgia  
SIDNEY S. SUTHERLAND, University of California, Davis  
WALTER T. BJORAKER, University of Wisconsin  
VERDINE RICE, NVATA, Williston, N. Dak.

## Summaries of New Studies, 1961-63

3105. ABDEL-AZIZ, ABDEL-HAMID F. Socio-Cultural Problems and the Role of Agricultural Education in the United Arab Republic. Dissertation, Ph. D., 1962, University of Illinois. 214 p. Library, University of Illinois, Urbana.

*Purpose.*—To examine some of the fundamental socioeconomic and cultural factors which affect the decision to enter upon farming on the part of those who have studied agriculture, propose a new role for agricultural education as an agent responsible for inducing social change in the UAR, and provide a general framework within which the role of agricultural education in newly developing countries can be better understood.

*Method.*—Data and information were secured from official documents and pertinent literature. The study presents an analysis of two sets of factors chosen arbitrarily and treated separately. The analysis is developed in terms of (a) farm land availability, (b) occupational opportunities, (c) the social prestige assigned to farming, and (d) cognitive dissonance, economic motivation, and social pressure. A comparative study of agricultural systems in nine countries in various developmental stages was also conducted to search for some general principles concerning the relationship between studying agriculture and establishment in farming.

*Findings.*—Although only 2 percent of the graduates of the secondary agricultural schools in the UAR had become established in farming, 80 percent of that small number quit farming within a short period of time and sought off-farm employment.

The failure of agricultural education to be followed by establishment suggested that there were factors outside education which determined the outcome of educational planning. It was found that the tremendous increase in population without a proportionate extension of the arable area had resulted in unavailability of farm land. While the population increased 378 percent over the last 80 years, the arable land and the crop-surface area increased only 25 and 51 percent, respectively. Establishment in farming through farm land ownership or rentals was found to be ex-

tremely difficult since it was determined by economic factors until 1952 and by law after that. Unemployment and underemployment were widespread in farming, and there were relatively more occupational opportunities outside. Farming has been assigned a low position on the scale of social prestige and power in the UAR. The cognitive structure of the Egyptian graduate, his economic aspirations, and the social pressure exerted on him have discouraged him from becoming established.

The study concludes that agricultural education is not the determinant in becoming established in farming in the UAR, that education seems to be viewed by the public as a means of attaining social mobility, and that establishment occurs in the absence of other occupational alternatives. It suggests that agricultural education must be provided for those who are already established.

3106. ALDRICH, GLENN CONAN. An Investigation to Identify the Aspects of Occupations Which Rural Boys Consider Important in Choosing an Occupation. Thesis, M.S., 1962, Washington State University. 52 p. Library, Washington State University, Pullman.

*Purpose.*—This study analyzed the importance that rural boys in the State of Washington placed on various aspects of occupations when they chose a lifework. Questions investigated were: (1) To what extent did the student consider his interests and abilities in making this choice? (2) Did he place more emphasis on the economic or on the noneconomic aspects of occupations?

*Method.*—Six schools with vocational agriculture departments and four schools without vocational agriculture departments were selected from an area in central Washington. A questionnaire was submitted to 139 graduating senior boys from these schools. The boys were asked, in an open-ended question, to tell what occupation they had chosen, and when they had made this choice. Another question asked what their interests and hobbies were, and two more inquired into their physical and mental abilities. The boys were told to rank as "primary," "major," "minor,"

or "not considered" 15 aspects of occupations. The high school counselors were queried as to how well each student had chosen his occupation in view of his abilities.

*Findings.*—Of the students investigated, 36.9 percent made their vocational choice before the junior year and 55.3 percent made their choice during the junior and senior years of high school. Only 7.8 percent had not yet made a choice of occupation when they answered the questionnaire near the time of graduation.

According to the counselors, 28 percent of the students chose their occupations "very well," 52.5 percent chose "well," 13.6 percent chose "poorly," and only 1.4 percent chose "very poorly." Appraisals for 4.5 percent were not made.

Considered of major importance by the students in choosing an occupation were: Interest in the work, job security, availability of employment, working conditions, suitability of the work to the student's mental abilities, and wages offered.

Of minor importance were: Chances for rapid advancement within the occupation, desire to build or create things, student's present economic status, interest in helping people, status expected in society, physical requirements, and need for identification with a group.

Essentially "not considered" by the students were the factors of commanding people and peer approval.

Economic motives as a group factor were considered significantly more important than noneconomic motives. Interest in the work was considered significantly more important than abilities, although the two are related. There was no important difference between the "abilities" and "motives" groups of factors.

3107. BAILEY, DAVID S. Drill-box Survey and Demonstration Plot Methods of Teaching Principles of Seed Quality. Thesis, M. Ed., 1963, The Pennsylvania State University. 30 p. Library, The Pennsylvania State University, University Park.

*Purpose.*—(1) To determine the quality of seed oats used by farmers; (2) to determine their knowledge of and attitudes toward high-quality seed; and (3) to test teaching aids which might contribute to better practices in growing small grains.

*Method.*—Farmers in the Selinsgrove (Pennsylvania) Area School District were chosen randomly from three groups. In the first group were 10 fathers of boys studying vocational agriculture, in the second group were 10 members of the young adult farmers class, and in the third group were 10 farmers chosen from the Agricultural Stabilization and Conservation Service list of other farmers in the area.

Seed oats samples were obtained in April 1963 from the first and second groups, using the drill-box survey method. The samples were sent to the State laboratory for analysis. A list of questions was used to check the farmers' knowledge of and attitude toward high-quality seed. A demonstration plot of randomized block design was seeded in four replications at four seeding rates—1, 2, 3, and 4 bushels per acre—with three germination levels—95, 84, and 75 percent. The 10 young farmer class members were kept informed of the demonstration plot observations. Results of the drill-box survey seed analyses were mailed to the fathers of the high school boys. The seed analysis reports were taken to the farm of each young farmer class member and discussed. The weed seeds in the seed sample were shown to the farmer as part of the on-farm instruction. At the close of oats harvest in August and after the program of teaching activities with the men in the first and second groups, the list of questions was administered as a test to the men in all three groups.

*Findings.*—Laboratory analysis of the 20 seed oats samples indicated that germination was good, averaging 93 percent. The range was from 67 to 99 percent. Weed seed content averaged 0.03 percent. Four samples contained prohibited weeds. Sixteen contained other crop seeds.

The pretest of knowledge of principles of seed quality showed no difference between the first and second groups of farmers. Administered as a test at the end of the study, the results showed significantly higher scores by the men in the second group—the young farmer class members. Scores of the men in group 3, the control group that received no special instruction, were not significantly lower.

None of the farmers had previously had a seed sample laboratory tested. In general, they did not understand weed seed regulations in the State seed laws. The men favored germination testing, but did not test seed used.

The 1963 season was very favorable to oats production. Subplots in the demonstration all yielded close to 84 bushels per acre. The instructional program was effective and should be continued.

3108. BAKER, JAMES KENNETH. Differences in Selected Characteristics Between Departments of Vocational Agriculture in Oklahoma That Exhibit Livestock on the State Level and Those That Do Not. Thesis, M.S., 1962, Oklahoma State University. 37 p. Library, Oklahoma State University, Stillwater.

*Purpose.*—To determine the effect that exhibiting livestock had on: (1) Participation in Future Farmers of America activities; (2) investment in farming; (3) labor income from

the farming program; (4) establishment in farming; (5) scholarship; and (6) community attitudes toward this type of program.

*Method*—Seventy departments of vocational agriculture in Oklahoma were divided equally into two groups, based on their participation in fairs and livestock shows. A questionnaire on the activities of the vocational agriculture department was mailed to these teachers to secure information for the study. In addition, other information was secured from the files of the State Department of Vocational Agriculture.

*Findings*.—The evidence presented clearly indicated that there was a desirable relationship between certain characteristics of an adequate program of vocational agriculture and the amount of participation of a department in fairs and livestock shows.

Those departments which rated high in exhibiting livestock were significantly ahead of the low group in (1) Gold, Silver, and Participating National Chapter ratings, (2) State and American Farmer Degrees, and (3) number of boys holding FFA offices above the county level. There was also a significant difference in favor of the high group with respect to: (1) Investment in the farming program, (2) investment in farm shop equipment, (3) labor income from the farming program, and (4) percentage of graduates in professional agriculture.

There was no significant difference between the two groups in: (1) Placement of graduates in farming and related occupations, (2) scholarship, (3) dropouts from vocational agriculture, (4) tenure of vocational agriculture teachers, and (5) number of Standard and Superior Chapter Awards.

The writer concluded that teachers of vocational agriculture and their students were justified in participating in fairs and shows if they used these experiences as the means to an end and not the end itself.

**3109. BEAR, WILLIAM FORREST.** Matriculation, Progression, and Employment Status of Agricultural Engineering Graduates from the Iowa State University of Science and Technology. Dissertation, Ph. D., 1963, The Iowa State University of Science and Technology. 184 p. Library, The Iowa State University of Science and Technology, Ames.

*Purpose*.—To determine desirable changes in the teaching and research programs of the Department of Agricultural Engineering. The graduates were asked to evaluate courses they had taken and to recommend any changes they thought would be effective. The number of semesters of high school courses such as vocational agriculture, science, and mathematics were obtained to determine the courses that significantly influenced college quality grade

point average. Relationships significant to income, area and location of employment, job classification, and participation in activities were investigated.

*Method*.—The 386 graduates had received the Bachelor of Science degree in agricultural engineering between 1942 and 1962. Data were obtained from the university permanent records, interview forms, and a questionnaire mailed to each graduate. Data were recorded on IBM cards, frequency counts made, and coefficients of correlation computed.

*Findings*.—Eighty-one percent of the graduates had been farm-reared and 80 percent of the parents were farm owner-operators or managers. The vocational agriculture instructor was more frequently mentioned than other high school teachers as having had influence on career selection. Thirty-five percent of the graduates had taken vocational agriculture during high school. Fifty-three percent of the graduates who had had vocational agriculture enrolled in the Power and Machinery option and 30 percent in the Soil and Water option. A larger percentage of the graduates who had had vocational agriculture became aware of the agricultural engineering profession during high school than other graduates.

The best predictor of first-quarter college quality point average was the high school point average and the best predictor of third-quarter college point average was the first-quarter quality point average. Semesters of mathematics and science courses in high school were positively correlated with college grade points. Cumulative college quality point average was the best single predictor for first employment income.

Seventy-eight percent of the graduates recommended increased emphasis on statistics courses. Increased emphasis was also recommended for courses in journalism, English, speech, and mechanics. Twenty-six percent of the graduates continued study beyond the Bachelor of Science degree.

**3110. BENDIXEN, JOE FRANCOIS.** Relation of High School Vocational Agriculture to Achievement in College Courses in Animal Science. Thesis, M.S., 1963, Iowa State University. 83 p. Library, Iowa State University, Ames.

*Purpose*.—To determine the relationship between semesters of high school vocational agriculture and achievement in college courses in animal science at the Iowa State University of Science and Technology, and to discover the relationships among some of the predictors commonly used in counseling students in the College of Agriculture.

*Method*.—The sample involved male students who matriculated in the freshman class in the fall quarter of 1955 in the College of Agriculture at Iowa State University, and

completed two selected college courses in animal science. Complete data were available for 321 cases which were analyzed in the study.

*Findings.*—Results of this study indicated that the high school quality point average and first-quarter college quality point average would be the most reliable predictors of the tendency to graduate from Iowa State University. Although no statistically significant relationship was found between enrollment in high school vocational agriculture and achievement in college courses in animal science, evidence presented did indicate that vocational agriculture students generally do as well or better than do nonvocational students in the introductory animal science courses at the Iowa State University of Science and Technology.

It was found that 24 percent of the 97 students who had had, and 29 percent of the 110 students who had not had, 7 to 8 semesters of high school vocational agriculture earned a final cumulative college quality point average of less than 2. Quality point averages in introductory animal science of 3 and above were obtained by 41 percent of the group who had had no high school vocational agriculture and by 49 percent of the group who had had 7 to 8 semesters.

Forty-two percent of the students who earned a quality point average of over 3 in advanced animal science courses had had no vocational agriculture, whereas 41 percent of the students who had vocational agriculture earned quality point averages of 3 or above in advanced animal science courses. The difference was not significant.

3111. BENTLEY, RALPH R. Factors Influencing the Vocational Choices of Agriculture College Freshmen. Studies in Education, No. 4, 1963. Purdue University. 51 p. Department of Education, Purdue University, Lafayette.

*Purpose.*—To determine (1) the relative influence of 36 selected factors on freshmen with respect to their choice of agriculture as a career and of a field of specialization in agriculture, and (2) the factors freshmen believe to be most important in a job.

*Method.*—The Purdue Agricultural Vocations Opinionnaire was administered to the freshman agriculture students early in the academic year 1961-62 at the following universities: Purdue, Ohio State, Kansas State, Minnesota, Kentucky, Missouri, and Wisconsin. Students were asked to indicate whether each of 36 factors influenced them "a great deal," "little," or "not at all" in their choice of agriculture as a career and their selection of a field of specialization in agriculture. They were also asked to select 5 of 16 opportunity factors they believed to be most important in a job.

Chi-square technique was used to determine whether or not there were significant differences in the responses of students when categorized by (1) university, (2) years of experience in selected activities, and (3) field of specialization.

*Findings.*—

1. In general, factors influencing most agriculture college freshmen with respect to their choice of agriculture as a career also influenced most students in their choice of a field of specialization.
2. The amount of influence that students by universities attributed to individual factors was significantly different for many of the factors studied.
3. The rank order of the 36 factors in terms of students influenced was essentially the same for the 7 universities.
4. Persons influencing the largest number of freshmen were fathers, mothers, teachers of agriculture, and friends.
5. Significantly more freshmen were influenced by teachers of agriculture than by any other professional person.
6. Factors influencing most freshmen were "work and farm experiences" and "vocational factors."
7. Opportunity factors selected, by more than 40 percent of the freshmen, as among the five most important factors in a job were, in order of importance: "To earn money," "to use your own ideas," "for continuous employment," "to be your own boss," "to do a variety of work," "to do good for others," and "for advancement."

3112. BENTLEY, RALPH R. and REMPEL, AVERNO M. A Comparison of Selected Factors in Departments of Vocational Agriculture Where the Morale of Teachers Is "High" With Departments Where the Morale of Vocational Agriculture Teachers Is "Low." Studies in Education, No. 1, 1963. Purdue University, 44 p. Department of Education, Purdue University, Lafayette.

*Purpose.*—To determine whether significant differences existed with respect to selected factors in departments of vocational agriculture where the morale of teachers was "high" and where the morale of teachers was "low." The factors selected for study were: (1) Student attitudes regarding their vocational agriculture teachers; (2) student feelings about the extent and intensity of problems related to their school work; and (3) student academic aptitudes.

*Method.*—Two groups of 25 agriculture teachers were tentatively selected on the basis of their level of morale as measured by the

Purdue Teacher Opinionnaire (Morale Inventory). One group consisted of Indiana teachers whose scores were among the highest, and the other group had scores among the lowest. Only those teachers were included who held the same positions in 1961-62 that they had held the previous year and who did not have marked changes in their morale scores between 1961 and 1962. The final teacher sample consisted of 21 high- and 21 low-scoring teachers.

The student sample included all students enrolled in the vocational agriculture classes taught by teachers in the study. The following instruments were used to collect data regarding the students: The Minnesota Student Attitude Inventory (MSAI), the SRA Youth Inventory (My School Section), and the Lorge-Thorndike Intelligence Test (Verbal Form).

Analysis of variance procedures were used to determine whether significant differences existed in mean MSAI and mean SRA Youth Inventory scores in "high" and "low" teacher morale situations.

*Findings.*—The MSAI mean score for students of "high"-morale teachers was significantly higher than the mean score for students of "low"-morale teachers.

The mean score on the SRA Youth Inventory (My School Section) for the students of "high"-morale teachers and the mean score for students of "low"-morale teachers were practically identical (46.76 and 46.56).

In general, the mean IQ level of students was higher in the "high"-morale teacher situations.

3113. BENTLEY, RALPH R. and REMPEL, AVERNO M. The Relationship of Selected Factors to Teacher Morale. Staff Study, 1962, Purdue University. 10 p. Division of Education, Purdue University, Lafayette.

*Purpose.*—To determine the relationship between the level of teacher morale and certain selected factors.

*Method.*—The first of these studies involved 488 teachers in 22 Indiana high schools. The Purdue Teacher Opinionnaire (Morale Inventory), designed to measure teacher morale, was administered to each teacher and personal data concerning such factors as sex, level of education, years of teaching experience, and tenure status were collected. The Opinionnaire was administered by the authors during a faculty meeting in each of the cooperating schools.

In the second study the Purdue Teacher Opinionnaire and a personal data form were sent by mail to all vocational agriculture teachers in Indiana. The factors studied in relationship to the level of morale of 263 respondents included education and teaching experience, the nature of professional responsibilities, salary and tenure provisions, and the

degree of satisfaction with the position and field of work.

Analysis-of-variance procedures were used in both studies to determine differences in teacher morale according to the factors selected.

*Findings.*—The studies showed that:

1. For the high school faculties of the cooperating schools in the first study, morale scores were significantly higher for women teachers than for men teachers.
2. For high school teachers generally, and for the vocational agriculture teachers, those having less than 10 years of experience had lower morale than those having 10 or more years of experience.
3. Differences in morale were not significant between high school teachers holding the bachelor's degree and those holding the master's degree. However, vocational agriculture teachers having the bachelor's degree with no or little additional training (under 12 semester hours) had significantly lower morale than those with more preparation.
4. Agriculture teachers in the higher salary brackets and those having tenure had significantly higher morale.
5. Teachers handling grade school agriculture and adult farmer classes had lower morale than those not teaching these groups.
6. No significant differences were found between teachers having or not having responsibility for high school general agriculture, classes other than agriculture, young farmer classes, 4-H Club work, and few or many 4-H Club members.
7. There was a close relationship between the level of morale of agriculture teachers and the expressed satisfaction of teachers with their positions. Also, high-morale teachers tended to believe more strongly in the future of vocational agriculture in Indiana.

3114. BENTON, RALPH A. A Study of Male Graduates of the Vocational Technical Institute of Southern Illinois University. Their Pre-Institute Experiences and V.T.I. Achievement. Staff Study, 1962, Southern Illinois University. 21 p. Department of Agricultural Industries, Southern Illinois University, Carbondale.

*Purpose.*—To analyze data on the graduates of the Vocational Technical Institute for information in counseling high school seniors on vocational choices and to determine from the data the advisability of developing technical curriculums in agriculture.

*Method.*—Data were secured from the student records in the University Registrar's Office. Included were high school transcripts

and the records of achievement in the Vocational Technical Institute.

The records of 575 male graduates from 1955-60 were analyzed. Approximately one-half were graduates of high schools with less than 500 enrollment. Based upon rank in their high school graduating class, these boys averaged 58.1 percent from the top.

*Findings.*—The pattern of courses taken in high school indicated that everyone had at least 3 years of English and 2 years of mathematics. In the science areas, approximately the same number had taken biology and general science. The smallest number had chemistry. Eighty-six percent of the graduates had taken either industrial arts or vocational agriculture.

Of 17 different curriculums in the Vocational Technical Institute, electronics was the most popular choice, followed by machine tool and automotive. Boys from smaller high schools seemed to prefer the automotive curriculum.

One-third of the 575 students lived on farms and, of these, 75 percent had taken vocational agriculture in high school. The electronics curriculum was most popular with them, automotive was second, and machine tool third.

Farm boys who did not take vocational agriculture in high school had taken a relatively large amount of industrial arts and mechanics instead. Their choice of curriculum in the Vocational Technical Institute reflected this interest.

Gradewise, the 575 graduates did not do quite as well in college as in high school. Approximately one-third of each curriculum is general education and two-thirds is technical. The graduates did slightly better in their technical courses than in general education.

**3115. BITTNER, RICHARD HUMMEL.** Identification of Selected Characteristics Associated with Continued Student Enrollment in Vocational Agriculture. Dissertation, Ph. D., 1962, Michigan State University. 199 p. Library, Michigan State University, East Lansing.

*Purpose.*—To determine whether selected personal characteristics of students and those of their family environments are associated with continued enrollment in vocational agriculture.

*Method.*—Selected characteristics of a sample of 444 students enrolled in vocational agriculture in grades 9, 10, and 11 in the school year 1960-61 who continued vocational agriculture in grades 10, 11, and 12 in the 1961-62 school year were compared with the characteristics of 111 students enrolled in vocational agriculture in the same grades during 1960-61 but who transferred to other high school subjects the next school year. The 39 schools from which the sample was selected were located within 2 Michigan farming areas. Data were obtained from administra-

tions of a questionnaire and the Wert-Myster Farming Attitude Scale, and from school records. Fisher's t-test and chi-square were used to treat the data.

*Findings.*—An analysis of the total student loss from the 39 departments revealed that: (1) 209 students, or 15.3 percent of the total enrollment of 1370, left vocational agriculture at the end of the 1960-61 school year; (2) of the total student loss, 43.1 percent, 35.8 percent, and 21.1 percent were freshmen, sophomores, and juniors, respectively; and (3) of the total student loss, 75.6 percent chose other high school subjects, 11.0 percent moved away, 12.9 percent left school, and 0.5 percent died.

Students who continued vocational agriculture differed significantly at the 1-percent level from students who transferred to other courses in that: (1) More re-enrollees lived on farms; (2) re-enrollees had more favorable attitudes toward farming as a vocation and as a way of life, planned to obtain less post-high-school education, and named occupational choices in lower aspiration levels and in different occupational fields; (3) more re-enrollees stated occupational choices related to agriculture, and more named farming as their first or second occupational choice; and (4) the occupational choices of re-enrollees were more consistent within aspiration levels.

Re-enrollees differed significantly at the 5-percent level from transfer students in that re-enrollees displayed less academic ability and expressed reasons for re-enrolling in vocational agriculture which displayed less consideration of long-term educational and/or occupational objectives.

The significant factors which apparently influence the decisions of farm boys to discontinue vocational agriculture were found to be not the relative opportunities they have to enter farming, but a less favorable attitude toward farming and a lesser desire to capitalize upon a farming background as an aid to becoming established in an agricultural occupation.

**3116. BLAKE, DUANE L.** Relationship of High School Training in Vocational Agriculture to Subsequent Establishment in Farming and Participation in Organized Groups. Dissertation, Ph. D., 1963, Iowa State University. 235 p. Library, Iowa State University, Ames.

*Purpose.*—To determine the relationship of high school vocational agriculture to participation in organized groups and establishment in farming.

*Method.*—The study included 320 male graduates from 20 pairs of randomly drawn high schools located in the north-central cash grain and the eastern livestock areas of Iowa. Twenty of the randomly drawn schools had offered vocational agriculture during at least 11 of the 12 years from 1943 through 1954.

They were paired with schools that did not offer vocational agriculture during the same period. All of the 320 high school graduates were farming or employed on the farm in 1955. Personal interviews were used to obtain the original data for this investigation. Data for the 1963 followup portion of the study were obtained by mail questionnaire.

*Findings.*—When compared on the basis of overall participation in all the farm organizations, the high school graduates who had parents that were classified as owners had an advantage over the graduates whose parents were classified as nonowners. The mean participation scores increased as the farmers became established and had been farming for a longer period of time. Vocational agriculture graduates participated more in farm organizations than the non-vocational-agriculture graduates.

The mean participation scores in youth organizations showed a more positive relationship for the vocational agriculture graduates than for the non-vocational-agriculture graduates when related with size of home farm, farming status, farm management practices used in farm records, farm management practices used, and total gross product.

The mean participation scores in farm organizations showed a more positive relationship for the vocational agriculture graduates than for the non-vocational-agriculture graduates when related with farm management practices used and total acres farmed. The same was found to be true when mean participation scores in cooperative organizations and in young and adult farmer classes were related with farm management practices used by the graduate.

The total mean scores in all organizations revealed a more positive relationship for the vocational agriculture graduates than for the non-vocational-agriculture graduates when related with farming status, farm management practices used in farm records, farm management practices used, and type of records used.

**3117. BODY, FREDERICK LOGAN.** Vocational Agriculture Programs in Ohio's Larger High Schools. Thesis, M. Sc., 1962, The Ohio State University. 124 p. Library, The Ohio State University, Columbus.

*Purpose.*—To show selected changes in the characteristics of Ohio high schools enrolling 350 or more students in grades 9 through 12, and changes in selected phases of the vocational agriculture programs within these schools.

*Method.*—A list of items was developed to give a concise picture of important characteristics and changes in the schools and in the programs of vocational agriculture. It was then determined which of the items could be obtained from reports and which would need

to be secured through the use of a questionnaire to local school administrators. The questionnaire was mailed to 99 administrators.

Characteristics and changes within the schools, school districts, and programs of vocational agriculture were determined, using the school years 1950-51, 1955-56, and 1960-61 as a basis upon which to determine the changes.

*Findings.*—Selected characteristics of, and changes in, Ohio's larger high schools that offered vocational agriculture included: Large enrollments; a wide variety of curricular offerings, including those in vocational and practical arts education; and more nonteaching and administrative positions than the usual pattern. These schools offered a substantial number of courses during the summer months, provided a variety of student services, and used more lay committees than were used in smaller schools.

The vocational agriculture programs in the larger high schools had more than one teacher of agriculture, had land laboratories, and had improved facilities. It was noted also that these departments were above the State average in enrollment of high school boys and young adult farmers, in number of on-farm visits, and in the quality of FFA programs conducted.

**3118. BOYKIN, WILLIAM C., Sr.** Competencies Needed by Vocational Agriculture Teachers for Effective Farm Mechanics Instruction. Dissertation, Ed. D., 1961, Indiana University. 181 p. Library, Indiana University, Bloomington.

*Purpose.*—To investigate the skills, abilities, and understandings essential to effective instruction in the farm mechanics phase of vocational education in agriculture in Mississippi. The study sought ultimately to establish an order of priorities in farm mechanics offerings through systematic analysis; to secure a basis for curriculum revision and subject matter selection in the farm mechanics phase of teacher education in agriculture at Alcorn A & M College, Mississippi; and to secure a basis for the implementation of an improved program of inservice teacher education in farm mechanics in Mississippi.

*Method.*—A list containing 351 competencies in farm mechanics was compiled from a review of related literature. The list was later reduced to 250 competencies and a numerical rating scale was devised. This instrument was then tested on a random sample of the proposed study population. The instrument was again revised to include 213 competencies, grouped into 15 subareas, representing the 5 currently recognized major areas of farm mechanics.

The investigator personally interviewed a 55-percent random sample of the Negro teachers of vocational agriculture in the State.

Based on the ratings assigned to the competencies by the teachers, weighted scores, mean ratings, rank orders, and Spearman rank order correlation coefficients were computed.

*Findings.*—(1) There was no significant relationship between the mean ratings assigned by the teachers on the 2 indices in 12 of the 15 subareas. In two of the subareas there was found a nonsignificant negative correlation between mean ratings assigned on the two indices. (2) In 3 of the 15 subareas included in this study the positive correlation between mean ratings and ranks assigned on the 2 indices was highly significant. (3) Of the 213 competencies constituting this study the teachers designated 23 as critical; they designated an additional 53 as those in which they felt a lack of competence to teach effectively. There were four subareas in which no critical competencies were designated. (4) The teachers tended to assign the more complex farm power-driven machinery items low ratings on both criteria; they tended to assign low importance ratings and high preparation ratings to competencies dealing with horse-drawn equipment; they tended to assign high importance ratings and low preparation ratings to competencies in modern welding processes. (5) A number of deficiencies indicated by the teachers suggested weaknesses in backgrounds in physics and mathematics.

X 3119. BRYANT, CHARLES D. Role Priorities of Beginning and Experienced Teachers of Vocational Agriculture in North Carolina. Dissertation, Ph. D., 1963, Michigan State University. 141 p. Library, Michigan State University, East Lansing.

*Purpose.*—To determine the priority beginning teachers gave and perceived should be given to 10 teacher professional roles and to compare their priorities with those of experienced teachers.

*Method.*—Data were obtained by means of a "role priority questionnaire" from 41 experienced and 40 beginning teachers of vocational agriculture in North Carolina. Ten teacher roles consisting of 100 role activities were studied. Four comparisons were made as follows: (1) The priority beginning teachers gave with the priority they perceived should be given; (2) the priority beginning teachers gave with the priority experienced teachers gave; (3) the priority beginning teachers perceived should be given with the priority experienced teachers expected of beginning teachers; and (4) the priority beginning teachers gave with the priority experienced teachers expected them to give the 10 teacher roles. Responses were given on two 5-point scales, one scale for priority given by each teacher group and the second scale for the priority each teacher group believed beginning

teachers should give the selected teacher roles. Chi-square was used to treat the data.

*Findings.*—Comparison of the priorities beginning teachers gave with the priorities they perceived should be given revealed that: (1) No conflict existed in the teacher roles of Utilizer of Educational Data, Contributor to Profession, and Contributor to Society. Significantly higher priority was perceived desirable for the teacher roles of Provider of Organized, Systematic Instruction for High School Students; Provider of Organized, Systematic Instruction for Young and Adult Farmer Groups; Provider of Individualized Instruction; Developer of Student Leadership; and Contributor to Self-development. Significantly lower priority was perceived desirable for the teacher roles of Counselor, and Initiator of Change.

Comparison of the priority beginning teachers gave with the priority experienced teachers expected of beginning teachers revealed that: (1) Each teacher group perceived similarly the role of Utilizer of Educational Data; (2) beginning teachers gave higher priority to Initiator of Change; and (3) the expectation of experienced teachers was higher for the remaining eight teacher roles.

Beginning teachers are faced with the task of shaping a manageable role for themselves within a reported work environment where high priorities are not only practiced but are desired. The expectations of experienced teachers for the role of beginning teachers appear to be unrealistic, far exceeding their own priorities for most of the roles. Apparently, beginning teachers enter teaching granting high priority to teacher roles not closely related with teaching, per se, and desire to increase the priority given these roles.

O 3120. BULLOCK, BURKE. A Survey to Identify and Describe the Characteristics of Twenty-Five Selected Young Farmer Chapters in Texas. Staff Study, 1963, East Texas State College. 33 p. Department of Agricultural Education, East Texas State College, Commerce.

*Purpose.*—To ascertain characteristics of some of the outstanding Young Farmer chapters in Texas.

*Method.*—Questionnaires were mailed to 35 Young Farmer chapters that had received honors at either the 1962 or the 1963 State Young Farmer Convention. These award-winning chapters were selected from a list furnished by the State association. Twenty-five questionnaires were returned. The data were compiled into chart form showing characteristics that were most prevalent in the chapters.

*Findings.*—Results from the survey indicated the following important characteristics of the award-winning chapters: (1) Eighty-eight percent of the members attending were

between 25 and 35 years of age. (2) Eighty-eight percent of the members had at least a high school education and 20 percent also had college education. (3) Forty percent of the members were landowners while 60 percent either rented or leased their land. (4) Approximately one-half of the farmers had \$30,000 to \$75,000 invested in their farming operations. (5) About two-thirds of the chapters were considered small chapters, having 10 to 30 members. (6) Approximately one-half of the chapters had from 10 to 20 members in attendance at each meeting. (7) Most of the chapters met biweekly or monthly. Some special meetings were held for short courses and other special problems. (8) The future plans of most chapters were to increase membership by having better programs. (9) The most popular types of programs seems to be those concerned with seasonal or current agricultural programs. Short courses, talks by resource personnel, and field trips were favored. (10) Family-style recreation was the most popular type.

According to the advisors, the major reasons why these chapters were now in operation were their good leadership and interested members. Most agreed that a good chapter must have a qualified set of officers and a challenging program of work. Some of the major problems listed by the chapters were quality of programs, interest among members, and meeting attendance in competition with television, church work, and other activities.

3121. BURT, HOMER O., JR. An Evaluation of Resource Units As a Teaching Aid in Vocational Agriculture. Thesis, M. Sc., 1961, The Ohio State University. 90 p. Library, The Ohio State University, Columbus.

*Purpose.*—To determine the use being made of resource units and how they could be improved as an aid to teachers of vocational agriculture.

*Method.*—The data were secured through questionnaires from 146 teachers of vocational agriculture in Ohio. Additional data for this study were secured from agricultural education departments of 17 different States.

*Findings.*—The swine, corn, wheat, and combine units were being used the most, while the poultry, strawberry, raspberry, sprayer, and forage harvester units were used the least.

The data indicated that resource units were used extensively as a guide in preparing lessons, as a general reference, and as a source of related information. The units were used to a limited extent as a student reference or complete lesson plan.

The livestock units as a group received a slightly higher rating for quality than either crop or mechanical units. The dairy unit had the highest rating and raspberry produc-

tion the lowest.

There appeared to be a great need for additional units in the management and mechanical areas.

A summary of the teachers' responses indicated that "teaching aids," "approved practices and skills," "related information," and "items to consider" should be included in most revised units. Teachers also recommended having the units color-coded to correspond with AGDEX, revising most units every 5 years, and publishing inserts frequently. They suggested in addition that a table of contents should be a part of each unit, information to be included in students' notebooks should be identified, the units should be punched to fit into a loose-leaf notebook, and they should be cumulative in nature. "Teachers and staff members" in combination were mostly commonly mentioned as the proper persons to develop resource units. Distribution of the units should be made when sufficient time could be given for explanation of them.

3122. BYRAM, HAROLD M. The Michigan Phase of the National Study of Young Farmer Instruction in Vocational Agriculture. Staff Study, 1962, Educational Research Series, 4. 66 p. Bureau of Research and Publications, College of Education, Michigan State University, East Lansing.

*Purpose.*—To evaluate under experimental conditions proposed patterns theoretically associated with successful programs, and to record the findings of the project in terms of recommendations for expanding the Young Farmer Instructional Program on a national scope.

*Method.*—The procedure developed by the American Vocational Association's Committee on Research in Agricultural Education was followed. The following schedules were used: Schedule X, Parts A, B, and C, to be completed by young farmers in the trial centers; Schedule Y, Parts A and B, to be completed by the teachers in the trial center classes; Schedule Z, Parts A and B, to be filled in by the teacher while interviewing the enrollee; and a class record form. Eleven pilot centers were established in Michigan; eight completed the project.

*Findings.*—Teachers ranked "personal contact," "responsibilities assumed by others" (presumably members), and "newspapers" as the more effective methods of recruiting. A majority of the class members gave top rating to "group discussion with teacher as leader," "class discussion," "teacher's instruction in class," and "individual help by instructor." Nearly 70 percent of the young farmers characterized the instruction as highly practical.

There was a marked increase in the proportion of "excellent" and "very satisfactory" ratings of young farmers' use of farming practices

from the beginning evaluation to the final evaluation. Differences in farming efficiency at the start of the trial period and at the end of the trial period showed increases in milk production per cow, eggs per hen, and pigs weaned per sow. Scores on social participation and cooperative activities were higher for the group at the end of the trial period.

A number of suggestions for organizing and conducting young farmer classes were made by the teachers in the meetings which they attended as trial center teachers. Teachers expressed themselves as believing that the number of young farmers was increasing, particularly those who have given promise of success in farming and rural leadership. They believe that a variety of methods should be used, and that good on-farm instruction is essential.

3123. CAIN, GUY E. A Study of the Physical Facilities in Eighty-Five Departments of Vocational Agriculture in West Virginia. Thesis, M.S., 1963, West Virginia University. 124 p. Library, West Virginia University, Morgantown.

*Purpose.*—To: (1) Determine the practices and prevailing conditions with respect to physical facilities housing vocational agriculture departments in West Virginia; (2) compare the recommendations of teachers of vocational agriculture in West Virginia and professional school people in other States with reference to physical facilities for vocational agriculture; and (3) develop an outline of reasonable objectives for the improvement of physical facilities for vocational agriculture departments in West Virginia.

*Method.*—A survey form was mailed to 115 teachers of vocational agriculture in West Virginia to obtain expressions of satisfaction experienced with their facilities, their preferences in a free-choice situation, and a description of their actual situations. Eighty-five teachers completed the form. The State supervisors of Vocational Agriculture in 25 States in the central, southern, and western regions of the United States were asked to furnish bulletins, floor plans, or other literature available pertaining to recommendations for school plant facilities for departments of vocational agriculture. Literature from the other 11 States of the North Atlantic region, of which West Virginia is a part, also was reviewed.

*Findings.*—The size of high schools in West Virginia has increased in recent years. The number of vocational agriculture classes taught per teacher and the number of students has increased slightly, and more teachers are also teaching nonvocational classes. These facts point to a need for larger facilities of permanent construction and properly equipped to meet the needs of rural boys.

Forty-nine percent of the shops and 45 percent of the classrooms in West Virginia were built between 1941 and 1950. The 85 schools in the survey had an average of 680 square feet of classroom floor space and an average farm-mechanics space of 1,630 square feet. Teachers in these schools recommended an average of 900 square feet for the classroom and 2,970 square feet for the shop. Supervisors in six States of the North Atlantic region recommended 1,900 square feet for the shop, while supervisors in 19 other States recommended an average of 2,390 square feet for the farm-mechanics area. Twelve new West Virginia shops constructed between 1952 and 1956 averaged 2,403 square feet.

A majority of the shops in West Virginia have inadequate storage facilities for tools and equipment, supplies, student projects, and farm machinery. A complete absence of designated storage space was reported as follows: Supplies and extra equipment—by 36 teachers; lumber and iron stock—by 28 teachers; and student projects and farm machinery—by 45 teachers.

It was found that a majority of the West Virginia facilities for vocational agriculture were separate units located on the ground floor, had some type of communication with the main school building, and had a separate entrance either from a hallway or from the outside. Forty percent of the classrooms had concrete floors, considered by the teachers to be undesirable. Very few were insulated. Other inadequacies of the classrooms and shops were in arrangement of work areas, lighting, plumbing, and heating.

3124. CAMERON, HAROLD L. A Survey of Off-Farm Agricultural Occupations in Huntingdon County, Pennsylvania, and the Pre-Employment Training Needed for Them. Thesis, M. Ed., 1962, The Pennsylvania State University. 47 p. Library, The Pennsylvania State University, University Park.

*Purpose.*—To determine: (1) Present employment opportunities and the employment trends for the next 5 years in off-farm agricultural occupations in Huntingdon County; (2) pre-employment agricultural education needs of those who enter off-farm agricultural occupations; and (3) needed changes in the vocational agriculture course of study.

*Method.*—The agricultural businesses in Huntingdon County were categorized as follows: Farm machinery and equipment sales and services; farm supplies and small equipment; landscape gardening and forestry; livestock industries; and farming by inmates of a correctional institution.

Personal interviews were conducted by the investigator with representatives of 28 businesses, including the correctional institution. A schedule was used to obtain data about the

agricultural business, employment trends, and specific areas of training.

**Findings.**—There were 337 persons employed in off-farm agricultural occupations in the 28 businesses. The average age of employees was 37 years. During the previous year, 14 new employees had been hired, making an increase of 4.3 percent. During the previous 3 years, 96 of the 337 employees had been replaced, making an annual turnover of 3.5 percent. An increase of only seven more employees, or 2.7 percent, was expected for the next 5 years, mostly in the farm supplies and small equipment businesses.

All employers agreed that a high school education and a farm background are important to all employees. All the businesses, except landscape gardening and forestry, considered most of the items of training in dairying to be of some importance. Training in agronomy was reported important to the correctional institution, to farm machinery and equipment sales and service, to farm supplies and small equipment, and to landscape gardening and forestry; however, it was of no value to the livestock industries. Livestock training was important to the correctional institution and of some importance to farm equipment supplies and small equipment, but of no importance to the other types of businesses. Farm mechanics training was rated of some importance to all the businesses except livestock industries.

All businesses gave a favorable rating to leadership training, competition in speech contests, and knowledge of parliamentary procedure. Having proper grooming and good manners was the highest rated item.

3125. CAMPBELL, J. M. and Staff. A Follow-Up Study of Former Students of Vocational Agriculture in Virginia. Staff Study, 1963, Virginia State Department of Education. 6 p. Agricultural Education Service, State Department of Education.

**Purpose.**—To determine the occupational status of former students who, having completed 1 or more years of vocational agriculture, graduated from or dropped out of the public rural high schools in Virginia during 1954, 1957, 1960, and 1963.

**Method.**—Data were supplied by teachers of vocational agriculture in Virginia on a form mailed to them from the Office of the State Supervisor of Vocational Agriculture.

**Findings.**—Of the 9,792 former students included in the study, 72.5 percent were high school graduates, while the other 27.5 percent had dropped out of school before graduation. In 1963, 25.7 percent of the former students were farming either full time or part time, and another 11.2 percent either were employed in or were receiving training for other agricultural occupations; therefore, 36.8 percent

were engaged in farming and related occupations. In addition, 25.3 percent of the former students were employed in occupations of a mechanical nature. Hence, over 62 percent of all former students, graduates, and dropouts who had completed 1 or more years of vocational agriculture were employed in some phase of agriculture or were employed in other occupations related directly to the mechanical training they received in vocational agriculture.

Only 1.3 percent of the former students were unemployed, and only 0.7 percent of those who studied vocational agriculture for 4 years were unemployed.

Approximately 2,750 boys who had studied vocational agriculture for at least 1 year either were graduated from or dropped out of the public schools in Virginia in 1963. About one-third of this number completed the 4-year course.

The most conservative estimates indicated that there would be an annual replacement need in Virginia of about 2,100 trained farm operators and farm workers by 1970. It was also estimated that an additional 1,500 trained workers would be needed for annual replacements in nonfarm but farm-related occupations, for a combined total of 3,600. The study concluded that the program of vocational agriculture in Virginia in 1963 was not producing enough young men who had completed 2 or more years of vocational agriculture to meet the State's replacement needs in farming and related occupations.

3126. CAPRA, LUIS CAMARA. Factors Affecting Instruction in Vocational Agriculture for Adult Farmers in Puerto Rico. Thesis, M.S., 1962, Virginia Polytechnic Institute. 120 p. Library, Virginia Polytechnic Institute, Blacksburg.

**Purpose.**—To determine: (1) The factors or conditions affecting the participation of teachers of vocational agriculture in the program of instruction for adult farmers in Puerto Rico; and (2) the interest of farmers in adult farmer classes.

**Method.**—Data were secured from 81 teachers and 45 superintendents by questionnaire, and from 119 farmers by personal interview.

**Findings.**—Teachers who participated in adult farmer classes to the greatest extent had lived in their school communities 10 or more years; were over 30 years of age; had been teaching vocational agriculture from 6 to 20 years; were farm reared; used their own cars for transportation; used advisory councils to assist in planning the instructional program; had completed farm surveys on at least 36 farms; used personal visits, letters, and schoolboys as the means of contacting farmers; were enrolled in a general course in agriculture while in college; and were interested in providing instruction for adult farmers.

Farmers who participated in adult farmer classes to the greatest extent were interested in attending such classes; lived within 1 kilometer of school; were not over 40 years of age; had from 11 to 20 years of farming experience; owned their own farms; owned from 11 to 40 acres of land; used their own cars to travel to and from classes; had attended school through the 10th or higher grade; and had children who were enrolled in vocational agriculture classes.

3127. **CARDENAS, MARIO L. and McCOMAS, J. D.** The Cooperative Relationships Between County Agricultural Extension Agents and Teachers of Vocational Agriculture in New Mexico. Staff Study, 1962, New Mexico State University. 67 p. Agricultural Education, College of Teacher Education, New Mexico State University, University Park.

*Purpose.*—To determine the extent of cooperative activities undertaken by teachers of vocational agriculture and county agricultural agents in New Mexico, and to develop suggestions for improved relationships between the two groups.

*Method.*—Questionnaires were mailed to all teachers of vocational agriculture in New Mexico (N-61) and to all county agricultural agents (N-26) in counties with departments of vocational agriculture. Responses were received from all county agents and from 48 of the 61 teachers of vocational agriculture.

*Findings.*—Most of the respondents indicated a commonality in objectives of the work of the teacher of vocational agriculture and the county agent. Teachers reported an average of 3.9 calls to the office of the county agent during the previous year. Seven county agents were not visited during the year by teachers of vocational agriculture in their counties.

Twenty-eight percent of all teachers and agents felt there was much cooperation between the two groups; 52 percent said there was some degree of cooperation; while 20 percent indicated there was little or no cooperation between their groups.

Suggestions for improved relationships included joint county planning meetings, an exchange of schedules of activities, cooperative training sessions for youth, joint tours, sharing of training aids, and inviting agents to visit vocational agriculture classes.

3128. **CHERRY, KENNETH L.** An Evaluation of the Understanding of FFA by Ninth-Grade Vocational Agriculture Students in Selected Pennsylvania Schools. Thesis, M. Ed., 1963, The Pennsylvania State University. 47 p. Library, The Pennsylvania State University, University Park.

*Purpose.*—To (1) evaluate the teaching of FFA in ninth-grade vocational agriculture classes, (2) determine the major items of a unit on FFA instruction, and (3) discover factors associated with FFA learning during the ninth grade.

*Method.*—Teachers in 20 selected schools rated 20 items of an FFA unit of instruction as "essential," "desirable," or "not needed." A 60-item multiple choice test was developed, based on the ratings by the 20 teachers. The test was given to 200 randomly selected ninth-grade students, 10 in each school, as a pretest in September 1962 and again as a test in May 1963. For each school the National Chapter Award rating was obtained. It was also learned whether each school had a Junior Agriculture Club. Differences between group means were analyzed statistically by appropriate t-tests.

*Findings.*—Teachers rated the FFA items of organization as most important, followed by items on leadership and on history. Student scores were high on items readily accessible to and of immediate interest to ninth-grade boys and low, even at the end of the year, on areas of leadership and of national degree information.

It was found that all schools had an increase in FFA understanding during the regular school year. This varied considerably, with one school having a mean gain of 3.2 and another school 28.5. The mean pretest score of the 200 students in the 20 schools was 24.9 and the mean test score was 36.8. The difference was significant.

Nine schools in the study had Junior Agriculture Clubs. The difference in their scores on FFA understanding was not significant.

The National Chapter Award ratings showed no significant difference between "Superior" and "Standard" chapters. The Superior Chapters, which included 15 schools, had a 4.2 higher mean pretest score and a 6.9 higher mean test score than the 5 Standard Chapters but this was not a significant difference.

Junior Agriculture Clubs and participation in the National Chapter Awards Program were further encouraged because of their value in other areas of vocational education in agriculture. It was recommended that more teachers teach a definite unit on FFA, with more emphasis on leadership and history.

3129. **CLARK, RAYMOND M.** Training for Off-Farm Agricultural Occupations. Staff Study, 1963, Michigan State University. 28 p. Office of Research and Publications, College of Education, Michigan State University, East Lansing.

*Purpose.*—To develop a vocational education training program at the high school level for occupations in farm service businesses which may involve instruction in agriculture, and in distributive, office, and trade and industrial

subjects together with an appropriate vocational guidance program.

*Method.*—The program was conducted following the pattern of diversified cooperative programs. The students were placed for work experience in nonfarm agricultural occupations and an additional program of related instruction in agriculture was provided for those whose work assignments indicated a need.

One of the unique characteristics of this program was the fact that the training programs were planned to provide understandings and skills from agriculture, business, trades, and many areas commonly described as "general education" as they were needed by workers in the occupation. This involved many members of the high school staff and required attention to individual needs of students throughout the year.

A followup of these students is planned after 1 year with evaluation by employers, students, and school administrators.

*Findings.*—Training for nonfarm agricultural occupations was not being offered despite the possibility that it might have been.

Further study of plans for vocational education indicated that adequate programs probably could not be offered in this area without: (1) Modification of present state policies and plans; (2) more adequately trained teachers in the fields of agriculture, business, and industry, as well as in such areas as economics, human relations, English, and mathematics; and (3) a staff at the State office level that would be able and willing to recognize the merit of a training program incorporating content from agriculture, business, and industry in a thoroughly integrated way.

3130. COLEY, WILLIAM HAROLD. A Study of High School Guidance Activities Regarding Vocational Agriculture Students in Tennessee. Thesis, M.S., 1962, University of Tennessee. 57 p. Library, University of Tennessee, Knoxville.

*Purpose.*—To evaluate guidance of vocational agriculture students by teachers of vocational agriculture in Tennessee. The factors examined were: (1) Type of materials available for guidance purposes in the schools; (2) kinds of tests administered to students and the use made of test results; (3) guidance activities engaged in by the school other than tests; (4) amount of teaching time devoted to units of guidance by the teacher of vocational agriculture and the content of these units; (5) qualifications of the teacher of vocational agriculture for guidance; (6) interests of teachers of vocational agriculture in additional training in guidance; and (7) teachers' opinions with respect to current programs of guidance in their schools.

*Method.*—Data used in the study were secured from 54 vocational agriculture teach-

ers in Tennessee. Further information was secured from related literature.

*Findings.*—The study indicated that most schools were carrying out programs of guidance. Testing programs were in operation in 48 of the 54 schools. There were guidance counselors who taught other classes in 29 schools. Tests given students varied with the different schools. Test results were reported as being used "some" by 28 of the schools and "much" by 3 schools. Other guidance activities carried out with students were college visitation, visits to agricultural businesses, and movies and filmstrips on guidance shown to students.

The study indicated that 37 agriculture teachers had received guidance training in faculty meetings, and that 10 teachers had had college guidance courses. Teaching units on guidance were included in nine of the departments of vocational agriculture.

The study showed that 47 teachers were interested in obtaining more training in guidance. They desired training to be given in group conferences and at annual conferences for teachers of vocational agriculture. Desire was expressed by 11 teachers to be enrolled in college guidance courses.

The opinions of the teachers regarding the influence of the present programs of guidance in Tennessee schools differed considerably. Twenty of the 54 teachers stated that present programs in guidance were beneficial to students of vocational agriculture while 9 indicated that the guidance program contributed to the directing of some slow learners into vocational agriculture.

3131. COOK, DONALD EUGENE. Occupational Status of West Virginia University Agricultural Education Graduates, 1951-61. Thesis, M.S., 1962, West Virginia University. 64 p. Library, West Virginia University, Morgantown.

*Purpose.*—To: (1) Show the occupational distribution and characteristics of men who qualified to teach vocational agriculture and biological sciences as graduates of the Agricultural Education Department at West Virginia University during 1951 through 1961; (2) determine the relation between university training and present position; (3) determine the degree of satisfaction with present position; and (4) determine the amount of graduate work completed.

*Method.*—Data for this study were collected by means of a questionnaire directed to the 152 graduates in agricultural education at West Virginia University for the 11-year period, 1951-61. There were 132 graduates, or 86.8 percent, who completed the questionnaire.

*Findings.*—Persons who were graduated from the high school curriculum in vocational agriculture were more likely to teach voca-

tional agriculture than those who did not matriculate in vocational agriculture. Vocational agriculture teachers played an important role in the decision of men to enter agricultural education.

It was found that 50 percent of the graduates entered their first or second teaching field and the majority of the graduates made their decision to enter their present occupation during college or after graduation from college.

Eighty-seven percent of the respondents reported being highly satisfied or reasonably well satisfied in their present occupations.

Eighty-two percent of the respondents now teaching vocational agriculture reported one or more hours of graduate credit. Nineteen percent reported having a Master of Science degree with a major in agricultural education.

3132. COUPLAND, JOE. Importance of Units of Instruction in the High School Vocational Agriculture Curriculum. Dissertation, Ph. D., 1962, The Ohio State University. 259 p. Library, The Ohio State University, Columbus.

*Purpose.*—To determine the relative importance of units which might be included in a high school program of instruction for vocational agriculture, to isolate those units which are essential to most programs of instruction for vocational agriculture in high schools, and to propose a guide for the selection of agricultural content to include in a program of instruction for high school vocational agriculture.

*Method.*—A questionnaire was used as the investigative instrument. It consisted of a rating scale designed to give a numerical value to each unit and thereby set up a rank order of importance for units, areas, and divisions of agricultural content which might be included in the high school program of instruction. This was a nationwide study involving superior teachers, as named by State supervisory personnel, and teachers selected at random.

Statistical treatment employed the use of rank order correlation applied to the ranking of areas by each group.

*Findings.*—Certain units of instruction were believed to be essential to most programs of instruction in high school vocational agriculture on a nationwide basis, and others were considered essential to most programs of instruction within regions. Certain units of instruction were of little or no importance to most programs of instruction in high school vocational agriculture nationally, and others were of little or no importance within regions. The superior and randomly selected groups of teachers generally agreed on the relative importance of the divisions and areas.

3133. COURTNEY, E. WAYNE. A Comparison of Knowledge and Experience

Levels Required in Three Agricultural Occupations. Dissertation, Ph. D., 1962, Purdue University. 80 p. Library, Purdue University, Lafayette.

*Purpose.*—This study was designed to determine the common and/or differentiated agriculturally oriented components among three selected agricultural occupations in Indiana, namely, farm real-estate broker, farm grain-elevator manager, and farmer.

*Method.*—A list of 148 agriculturally oriented components, indicative of job activities, representing 6 subject matter areas, was presented to a random sample of 2 individuals in each of 3 occupational groups in each of 10 randomly selected communities in each of 2 type-of-farming areas in Indiana. The total sample included 120 individuals. Each person was requested to assign a judgmental score to each component, on a 5-point scale, to denote the amount of knowledge and experience required for each of the 148 components for his occupation. For each component, three hypotheses of major interest were postulated: (1) There is no occupational group effect; (2) there is no type-of-farming area effect; and (3) there is no interaction of occupational group with type-of-farming area. Nonrejection of the first hypothesis was taken as indication of a common component for the three occupational groups, and nonrejection of the second hypothesis was taken as indication of a common component for the two type-of-farming areas. Where hypotheses were rejected, individual comparisons of the occupational group means were made, using the Newman-Keuls method of analysis.

*Findings.*—The findings may be summarized as follows:

1. There was practically no indication of an effect due to the two type-of-farming areas, and there was practically no indication of interaction of type-of-farming areas with occupational groups.
2. There were indications that in order to examine the existence of common and/or differentiated components in agricultural occupations, the examination should be focused on pairs of occupations. A selected pair may be farming and one nonfarm but farm-related occupation, or two nonfarm but farm-related occupations. When the hypothesis that 3 means were equal was tested, for 116 components the hypothesis was rejected and for only 32 was it not rejected. However, when individual comparisons were made of pairs of means in the analysis of variance, 89 common components were found between farming and grain-elevator operator-managers, 58 common components between farmers and farm real-estate brokers, and 106 common

components between farm grain-elevator managers and farm real-estate brokers. The majority of the components common to the latter group comparison were scored low by both occupations.

3. The pattern of commonality differed with the arbitrarily classified sections of components. Farmers and grain-elevator managers tended to score components in the livestock and grain and forage crops sections higher than did real-estate brokers, whereas farmers and real-estate brokers tended to score components higher in the soils and fertility and farm management sections than did the grain-elevator managers.

3134. DOOLEY, DELMER J. *The Development of Agricultural Education in Iran.* Dissertation, Ed. D., 1963, University of Missouri. 244 p. Library, University of Missouri, Columbia.

*Purpose.*—To investigate and describe the development of agricultural education in Iran.

*Method.*—Data were obtained from: (1) A comprehensive review of related research findings and literature of the Near East; (2) personal work experience, records, and reports; (3) records and documents of the Ministry of Education, Ministry of Agriculture and Plan Organization of Iran; (4) material supplied by personnel of the New York and Tehran offices of the Near East Foundation; (5) United Nations surveys and reports; (6) U.S. Department of State unclassified fact sheets and reports; (7) translations of Iranian Government laws and regulations approved by the High Council of Education.

*Findings.*—Nine major characteristics of Iranian agriculture were investigated under the headings of patterns of land ownership, land use systems, land tenure, water resources and irrigation, agricultural methods, farm mechanization, agricultural credit, transportation and communication, and rural health and sanitation.

The development of vocational-type agricultural schools has been underway for less than 25 years. The recently adopted philosophy of the Ministry of Education is that education should train students to become effective members of their society. The present pattern of agricultural training includes rural primary schools, agricultural teacher training centers, agricultural high schools, and practical farm schools.

Vocations that emphasize training in agricultural education as a preservice requirement were identified for rural primary teachers, agricultural extension agents, community development workers, young farmers, agriculture teachers, and agricultural specialists.

The practical farm school offers a 1-year curriculum of 2,118 instruction periods about

equally divided between class and field work.

The agricultural teacher training centers offer a 2-year curriculum, of 1,360 hours each year, in seven broad areas: Technical agriculture, nature science, physical science, sanitation, social science, language, and education.

The agricultural high school offers a third year of training in which a student may specialize in agronomy, agricultural machinery, animal husbandry, agricultural extension, horticulture, rural arts, or farm management. Graduates of agricultural high schools receive a certificate of vocational efficiency.

3135. DRABICK, LAWRENCE WILLIAM. *The Vocational Agriculture Student and His Peers.* Staff Study, 1963, North Carolina State College. 60 p. Department of Agricultural Education, North Carolina State College, Raleigh.

*Purpose.*—To determine the occupational and educational aspirations of senior vocational agriculture students in North Carolina, to compare them with the occupational and educational aspirations of other high school senior males, and to compare vocational agriculture and other high school senior males on a number of variables which might be associated with occupational and education aspirations.

*Method.*—Interview schedules were administered to the senior classes of 12 white and 11 Negro high schools in the State. The high school most nearly the average size of all those offering vocational agriculture in each non-metropolitan economic area of the State was chosen.

The IQ of each student was obtained from school records. A modified version of the North-Hatt Occupational Prestige Scale was used to determine prestige of occupations to which students aspired as well as the occupations of their fathers. Data were analyzed by chi-square at the .05 level of significance.

*Findings.*—For white students: Senior vocational agriculture students aspired to occupations of lower prestige than did other male senior students, the difference being significant. Vocational agriculture seniors planned to attend college in lesser proportion than did other male seniors. When college plans of vocational agriculture students were analyzed, using "plan to farm" as a sort factor, it was found that college intentions of vocational agriculture seniors who planned to farm were not significantly different from those of other male seniors. Vocational agriculture students who did not plan to farm planned to attend college less frequently than did other male seniors.

On most of the "source" factors analyzed (e.g., mother's attitude, father's attitude, influence of high school education, father's education, etc.) there were no significant differences between the vocational agriculture and

other male seniors with exception of the following factors: Vocational agriculture students perceived their families as having less influence on the college decision; the prestige rating of the occupations of the fathers of vocational agriculture students clustered in the 60-69 range while the prestige rating of the occupations of fathers of the other male seniors was higher; vocational agriculture students more frequently were from farm and rural residences; vocational agriculture students planned to marry sooner after graduation from high school; and vocational agriculture students were found less frequently in the high IQ ranges.

For Negro students: Vocational agriculture students aspired to occupations of low prestige; the difference between them and other male seniors being significant. Vocational agriculture students planned to attend college less frequently than did other male seniors. For those vocational agriculture students who did not plan to farm, educational plans were less than those of other male seniors. The number of vocational agriculture students planning to farm was too small to make a comparison.

Of the "source" factors analyzed, there were significant differences only for place of residence and intelligence; more of the vocational agriculture students were from open country residence, significant at the .01 level, and more vocational agriculture students had low IQ scores, significant at the .05 level.

**3136. DRAKE, WILLIAM EMERSON.** Perceptions of the Vocational Agriculture Teacher's Professional Role in Michigan. Dissertation, Ph. D., 1962, Michigan State University. 240 p. Library, Michigan State University, East Lansing.

*Purpose.*—To (1) determine the expectations held for the professional role areas of the teacher of vocational agriculture as perceived by school superintendents, teachers of vocational agriculture, teacher educators and state supervisors in agricultural education; (2) identify consensus or lack of consensus on specific activities; and (3) identify relationships between perceptions of role expectations and selected background variables of superintendents and teachers of vocational agriculture.

*Method.*—From a review of the literature and the use of a panel technique a list of 102 role definitional activities of the teacher of agriculture was prepared in the form of a perception-expectation questionnaire. The role definitional activities on the questionnaire were classified in eight role areas. The sample position groups responding to the questionnaire were composed of 78 Michigan teachers of vocational agriculture, 78 school superintendents, and the teacher educators and state supervisors of agricultural education in

Michigan. The respondents expressed their perceived expectations along a 5-point scale. Mean responses were used as a measure of expectations held by the respondents and standard deviation was used as a measure of variability in responses. Correlation coefficients were calculated to determine the statistically significant relationships between responses and background variables.

*Findings.*—Responses of superintendent, teacher of vocational agriculture, teacher trainer, and state supervisor position groups revealed that perceived expectations for the professional role areas of the teacher of vocational agriculture differed both within the groups and between the groups. Weighted mean responses on the 102-role definitional activities indicated that 38 of the activities received weighted mean responses of 3 or more and were expected to be performed.

Differences in mean responses between the position groups revealed a lack of consensus on specific role definitional activities. Lack of consensus appeared more often in role areas VII, Directing the Program of Adult Farmer Education, and VIII, Directing the Program of Young Farmer Education. Expectation of the superintendents and State supervisors differed on a greater number of activities than did the expectations of any other two groups.

Superintendents and teachers of agriculture indicated similarity in their perceptions of the relative importance of the eight professional role areas. Role areas VIII, Directing the Program of Young Farmer Education, and III, Improving the Environment of Farm People, were perceived by both teachers and superintendents as having low relative importance. Role areas V, Participating in the Professional Work of the School, II, Guiding and Counseling, and VI, Working as a Member of the Teaching Profession, were perceived by both teachers and superintendents as having high relative importance.

**3137. DRAPER, BENJAMIN BROWN.** A Study of the Use Made of Resource Personnel by Teachers of Vocational Agriculture in Tennessee. Thesis, M.S., 1962, University of Tennessee. 75 p. Library, University of Tennessee, Knoxville.

*Purpose.*—To determine the use made of resource personnel by Tennessee teachers of vocational agriculture in agricultural education programs.

*Method.*—Information for this study was secured from questionnaires mailed to a third of the vocational agriculture teachers in Tennessee.

*Findings.*—Teachers with 10 or more years of teaching experience made greater use of resource agencies than did teachers with less than 10 years of experience. Teachers in urban areas used resource agencies more than did teachers in strictly rural areas. Teachers

working within 100 miles of universities or colleges that teach agriculture used resource agencies more than did teachers working at a greater distance from such institutions.

Agencies and persons used were the Soil Conservation Service; feed and seed companies; insecticides companies; the Cooperative Agricultural Extension Service; cooperatives (other than marketing and credit); local mechanics; tobacco grading specialists; commercial representatives; foresters; and representatives of the Tennessee Valley Authority, U.S. Department of Agriculture, Agricultural Stabilization and Conservation Service, and others.

Resource people were found to be of great help in guiding agricultural education programs, enabling students to keep up-to-date technically, improving school-community relations, and developing a feeling of general participation in the programs as opposed to teacher domination of them. A great number of able people were discovered awaiting an invitation to serve.

3138. DRAWBAUGH, CHARLES C. A Teaching Experiment in the Use of Greenhouse Facilities in Vocational Agriculture. Dissertation, D. Ed., 1963, The Pennsylvania State University. 124 p. Library, The Pennsylvania State University, University Park.

*Purpose.*—To measure the comparative effectiveness of three kinds of plant-growing facilities and three teaching methods for learning plant science principles relative to the environmental factors of light, temperature, moisture, aeration, and nutrients. The kinds of facilities were school greenhouse, community greenhouse, and classroom window sills. The teaching methods were laboratory manual, functional experience, and the teacher's own method.

*Method.*—Nine high schools having each of the kinds of facilities were randomly assigned, three to each teaching method. The schools in the laboratory manual and functional experience method groups were given sufficient chrysanthemum cuttings, daffodil bulbs, and cabbage and tomato seeds to crop 100 square feet of bench space. A portfolio of resource booklets and a list of textual aids were furnished to the teachers in these groups.

A random sample of 10 students was drawn from the class in each school to provide the data. Individual differences among students were partially controlled by the plant science pretest scores and class rank in fifths. The major statistical procedure was multiple classification analysis of covariance. The hypotheses were tested at the .05 level of significance.

*Findings.*—Scores on the criterion test showed that: (1) The total achievement in plant science by students using school green-

houses was greater than it was by students using the other facilities for growing crops; (2) achievement in knowledge of greenhouse management and of plant science principles by students taught by the laboratory manual and functional experience methods was greater than it was by students in schools where the teacher's own method was used; (3) the amount of application of principles to other crops made by students for the environmental factors of light and nutrients was greater than it was for temperature, moisture, and aeration; (4) the amount of application made by students to forest and orchard crops was greater than it was to garden, field corn, and forage crops; and (5) students enrolled in biology during the year of the study did not show a greater difference from pretest to test scores than students not enrolled in biology.

The findings indicated that properly managed greenhouse facilities and a well-organized teaching plan are required if greenhouse management and plant science principles are to be taught effectively. The way in which subject matter is written does not necessarily change the method of presentation by the teacher. Teaching aids which stimulate transfer of learning need to be developed.

3139. DUNHAM, DANIEL B. Subject Matter Principles Basic to Organizing and Teaching Fundamentals of Plant Science. Thesis, M.S., 1963, Oregon State University. 68 p. Library, Oregon State University, Corvallis.

*Purpose.*—To develop a minimum number of subject matter principles basic to organizing and teaching fundamentals of plant science, and to assure that any materials developed would reflect consolidation, delimitation, and scientifically accurate content which would encourage teachers of agriculture to consolidate fragmented and compartmentalized subject matter knowledge in agriculture into sound and usable units of instruction.

*Method.*—A committee of subject matter specialists, professors of agricultural science at the university level, assisted the investigator in developing and authenticating the principles of plant science.

*Findings.*—The body of the study was built around a framework of four principle categories. Each of the four categories was supported by several subprinciples of related agricultural subject matter in plant science. Each subprinciple was, in turn, supported by a series of important facts intended to lend clarification to the meaning of the statement of principle. The four categories were placed in a progressive relationship to each other beginning with fundamentals and progressing through process to product and the ecological effects which influence the product. A functional glossary of definitions of terms was appended.

It was concluded that the procedures used in carrying out the study were valuable for the purposes of consolidating and upgrading content in agricultural subject matter; that a unit in soils and plant nutrition developed as one of 10 procedural steps in the study had been proved usable on the high school level; that consolidating fragmented knowledge into whole units of instruction was an aid to teaching; and that students benefited when subject matter specialists synthesized subject matter into basic, related, principles.

3140. DUNHAM, MILAN G. A Procedure for Utilizing the Small Gasoline Engine As a Teaching Aid. Thesis, M. Sc., 1961, The Ohio State University. 51 p. Library, The Ohio State University, Columbus.

*Purpose.*—To: (1) Develop a simple inexpensive power-measuring device for use in demonstrating operative principles of small gasoline engines; (2) calibrate this device; (3) make construction details available; and (4) offer suggestions for using the device as an aid in teaching the ordinary skills needed to operate, maintain, and service small gasoline engines.

*Method.*—A pony-brake-type device was first developed, using a V-type pulley with oil-soaked hard maple blocks for brakes. This arrangement was unsatisfactory and was rejected because the brake overheated and readings were erratic. The pony-brake-type apparatus was further explored, using a flat-faced hollow flanged drum. Water was used for cooling, but this method was abandoned because the heated water could not be removed satisfactorily from the brake drum.

The hydraulic dynamometer was designed through trial and error and fabricated from salvage materials. The original idea was that it should be used by students as a testing device for tuning up lawnmower engines. The engines were to be tested for horsepower before servicing and to be retested to determine extent of improvement. This proved impractical because too many engines were inoperable for preservice testing. So it was decided that the best use of the hydraulic dynamometer was as a teaching aid, not as a testing device.

*Findings.*—The hydraulic dynamometer used oil as the fluid medium. This permitted continuous operation up to 1 hour for a 9-horsepower engine. The machine could be used to measure malfunctions and maladjustments. It was recommended that there be further development and simplification of the hydraulic dynamometer, and that handbooks be prepared for using the device properly as a teaching aid. Teachers were to be encouraged to use the device, to keep records on its use, and to evaluate the results.

3141. DUNN, BILLY RAY. Comparison of Certain Factors Between West Vir-

ginia University College of Agriculture Enrollees, 1950-60, Having and Not Having Vocational Agriculture in High School. Thesis, M.S., 1962, West Virginia University. 57 p. Library, West Virginia University, Morgantown.

*Purpose.*—(1) To determine achievement of students with varying amounts of vocational agriculture in high school in selected agriculture subjects and constants required in all curriculums in the College of Agriculture; and (2) to test the following hypothesis: The amount of vocational agriculture taken in high school has no effect on performance of students in the College of Agriculture at West Virginia University in selected agriculture courses and constants required in all curriculums.

*Method.*—Students selected for the study included all those enrolled in the College of Agriculture, Forestry, and Home Economics, Division of Agriculture, West Virginia University, during a period beginning September 1, 1950, and ending February 1, 1960. A form was constructed on which was recorded: The number of units, if any, of vocational agriculture with which a student was credited in high school; dates of enrollment, withdrawal, and/or graduation at West Virginia University; academic grade received in each of the 16 selected subjects; institution in which the student first enrolled; and the curriculum selected by the student. The F-test for analyzing variances of test scores of uneven groups was then applied to determine if any significant differences existed between the accomplishments of students with varying levels of high school vocational agriculture.

*Findings.*—On the basis of the F-test for measuring variances of test scores, it was concluded that of the 16 subjects tested, only in Biology 1, Agronomy 2, and Horticulture 1 were there any significant differences in the academic achievement between the means for the 5 groups tested. Using the grade point averages as a basis of comparison, it was found that of the 16 subjects tested, only in Biology 1 was the student with a background in vocational agriculture inferior in academic college achievement to the non-vocational agriculture student. Both groups were found to be deficient in academic achievement in Chemistry 1 on the basis of requirement of a 2 grade point average for college graduation.

It was thus concluded that, assuming the several levels of vocational agriculture were the same in all high schools and all other factors being equal, high school students with a curriculum which consisted of varying amounts of vocational agriculture were as well prepared to do work in the basic subjects of the College of Agriculture, Forestry, and Home Economics, Division of Agriculture, West

Virginia University, as those students with a curriculum excluding vocational agriculture.

3142. DUTENHAEVER, PAUL WILLIAM. *Farm Management Problems of Ohio Young Farmers*. Thesis, M. Sc., 1961, The Ohio State University. 97 p. Library, The Ohio State University, Columbus.

*Purpose.*—To identify the problems of Ohio young farmers in the area of farm management, and to determine the importance of these problems.

*Method.*—A checklist for identifying farm management problems included 185 problem items from 10 management areas. Information regarding amount of investment in farming; age; educational level; and marital, military, and farming status was also secured. Questionnaires were returned by 121 young farmers.

*Findings.*—The Ohio Young Farmer Program was found to comprise young farmers who were approximately 25 years of age, and generally had completed high school and 4 years of vocational agriculture. Approximately one-half were married. Most of the young farmers had more than \$2,000 invested in farming and were renters and operators or partners in the farm business.

The data were interpreted for three groups of farmers according to farming investment. Improving soil fertility was ranked by all young farmers as the most important problem. Controlling livestock disease ranked second, while one-half of the top 12 problems concerned farm machinery.

Problems named by those with farming investments below \$2,000, representing 21 percent of the respondents, centered mainly on farm machinery and financing the farm business. Those with investments of \$2,000 to \$10,000 (38 percent of the young farmers) reported problems of wide diversification, with the top 10 problems from 6 different management areas. Four of the top six problems were of financial nature in the group with over \$10,000 invested in farming. This group represented 41 percent of the young farmers reporting.

Ninety-eight percent of the young farmers indicated that they enjoyed using a checklist as a way of identifying problems in farm management and believed it gave them a well-rounded picture of their problems.

3143. EVERETT, VERN DUANE. *A History of Teacher Training in Nebraska for Vocational Education in Agriculture, 1917-1962*. Thesis, M.S., 1962, University of Nebraska. 119 p. Library, University of Nebraska, Lincoln.

*Purpose.*—To trace changes in the curricular offerings and staff activities which have

taken place in the Department of Vocational Education in Agriculture at the University of Nebraska.

*Method.*—Materials were collected from a variety of sources, including official minutes of the Nebraska State Board for Vocational Education, and the Board of Regents of the University of Nebraska, the Annual Report of the Teacher Training Department, descriptive reports from the Vocational Division of the Department of Education, and interviews.

Materials were categorized in four major sections: The staff; the facilities; preservice training; and inservice training. The preservice training section included requirements for teacher certification and graduation, courses offered, recruitment of trainees, enrollment of the department, and the placement of trainees. The inservice training section comprised graduate program, advanced degrees, courses offered, itinerant teacher training, teaching aids, and research.

*Findings.*—A resumé of the events beginning in 1900 and leading to the establishment of the Agricultural Education Department in the University of Nebraska, the passage of the Smith-Hughes Act and its subsequent adoption by the State of Nebraska, and the present program was given. Each aspect of the teacher education program was reviewed from its beginning to the present.

3144. FECK, VINCENT J. *Measures of Economic Aspects of Farming Programs of Students of Vocational Agriculture*. Thesis, M. Sc., 1961, The Ohio State University. 127 p. Library, The Ohio State University, Columbus.

*Purpose.*—To consider certain measures which could enable the qualitative and quantitative evaluation of the economic aspects of farming programs for students of vocational agriculture in the United States.

*Method.*—Annual farming program report forms, State Farmer application forms, and farming program record books of 39, 40, and 33 States, respectively, were used as sources from which measures of the economic aspects of farming programs were identified. These were classified as measures of economic input, output, efficiency, and growth of farming programs.

*Findings.*—Two measures—the number of acres by crop and the number of livestock—were the most frequently found measures of economic input, or scope of farming programs. Production man-work units, though found infrequently in the documents studied, were considered useful in scope comparison analysis of different farming programs and in the estimation of labor input.

The most frequently used measures of economic output were total production (as total yield, pounds produced, etc.) and total returns or income. Such measures as net profit and

management returns, though useful in evaluating output of farming programs, were found infrequently in the documents studied.

Measures of efficiency, such as yield per acre and production per animal, were lacking in most State Farmer application forms and annual farming program report forms. This was taken to indicate that an analysis of the production efficiency of farming programs has not been a significant factor in the evaluation of individual farming program development.

Measures of managerial ability and management achievement or efficiency were not included in most of the documents studied.

Economic growth of farming programs appeared to be most frequently depicted by means of a net worth statement (assets minus liabilities).

3145. FLOYD, JOHN C. A Study of the Participation in Contests and Shows by Students of Vocational Agriculture in Texas, 1960-61. Thesis, M.A., 1962, Southwest Texas State College. 56 p. Library, Southwest Texas State College, San Marcos.

*Purpose.*—To determine: (1) The extent of school participation in agricultural contests and shows in the State of Texas sponsored by the Future Farmers of America; (2) the number of school days spent preparing for shows; (3) the number of school days lost while exhibiting at shows; (4) the number of contests entered by schools; (5) the method of selection of team members for contests; (6) the class time spent training teams for contests; (7) the class time used to participate in contests; (8) the teacher evaluation of student interest in contests; and (9) the vocational agriculture teachers' college preparation and/or inservice training in the various contest areas.

*Method.*—A review of related literature was made to ascertain what studies others had conducted in the field of agricultural contests and shows. A survey was made by means of a questionnaire sent to 150 vocational agriculture teachers (15 vocational agriculture departments from each of the 10 supervisory areas in the State were selected and sent questionnaires).

*Findings.*—Agricultural contests were entered by 98.6 percent of the schools. Livestock shows were entered by 86 percent of the schools. Four school days were spent preparing for the average show. The average student missed 0.48 school day while exhibiting animals at shows. An average of 2.3 shows were entered by each participating student.

The more popular show entries revealed by the percentage of students exhibiting were: Lambs, 20 percent; barrows, 18.4 percent; and steers, 17.3 percent. County or local shows

accounted for 65 percent of the participating exhibitors.

Vocational agriculture teachers were training an average of 6.6 contest teams each year, with each team entering an average of 1.75 contests. First-year vocational agriculture students provided 40 percent of the team members. The teachers were spending an average of 10.6 class hours training each contest team. Seventy percent of the teachers were not using school time for contest participation. The remaining 30 percent used an average of 4.12 hours of school time for contest participation.

The more popular contests revealed by the percentage of schools entering were: Livestock judging, 88.1 percent; dairy judging, 82.9 percent; Greenhand chapter conducting and FFA quiz, 61.8 percent each; and poultry judging, 52.6 percent. The contests with the largest number of entries were in those subject areas where the teachers had 6 semester hours or more of college training.

3146. FOUT, LAWRENCE O. Materials Available in the Occupational Information File for High School Students Pertaining to Careers in Agriculture, Agricultural Education and Vocational Agriculture. Thesis, M.S., 1963, West Virginia University. 148 p. Library, West Virginia University, Morgantown.

*Purpose.*—(1) To determine if schools having vocational agriculture and educational and vocational guidance departments have occupational information files; (2) to learn whether occupational information files are available to all students; and (3) to learn what career information is available in the files dealing with agriculture, agricultural education, and vocational agriculture.

*Method.*—The study included 292 schools having vocational agriculture departments in the 12 States of the North Atlantic region. Guidance personnel were contacted by use of a questionnaire devised to secure information regarding the availability of occupational information files and, if available, the content of the files in three agricultural classifications. For each item the publisher, date of publication, and cost were requested.

*Findings.*—Satisfactory returns were received from 188 schools. Percentage returns for the 12 States included in the study ranged from 45 to 81 percent. The average return from all States was 64 percent. Of the 188 schools returning a questionnaire, 90.9 percent had an occupational information file. Only one school reported having a file that was not available to students.

The content of the occupational information files as revealed by listings of available publications on careers showed as few as 3 to as many as 42 publications available to students

in the 3 fields. Of the 3 fields studied, agriculture is best represented with a total of 116 different publications listed. There were nine different agricultural education and six different vocational agriculture publications available to students in the occupational information files.

The value of the occupational information file could be improved if guidance personnel were able to devote full time to guidance duties, and if they had satisfactory ways of making known to students and teachers the list of publications available on careers in agriculture, agricultural education, and vocational agriculture.

3147. FOWLER, FREDERICK A. A Suggested Farm Forestry Curriculum for Vocational Agriculture. Thesis, M.S., 1963, Oregon State University. 107 p. Library, Oregon State University, Corvallis.

*Purpose.*—To determine how farm forestry might be included in vocational agriculture programs in communities where forestry plays a significant role in the local economy.

*Method.*—Questionnaires were sent to 60 departments of vocational agriculture in Oregon and Washington located in important forestry counties.

*Findings.*—(1) Twenty-three of the 30 schools reporting forestry instruction indicated that forest land was being used for practical field instruction; (2) the schools averaged 3 students with forestry supervised farming programs reported; (3) the total number of hours devoted to instruction in forestry ranged from an average of 8 during the freshman year to 16 during the senior year with 14 hours each for both sophomore and junior years; (4) the most important teaching methods used in this area were lectures, field trips, and group discussion; (5) the most important field trips that were taken in connection with forestry instruction were tree planting, a trip through a forest nursery, and a timber cruising field trip; (6) there was an increase in the complexity of subject material from the freshman to the senior year; and (7) there were many public and private forestry organizations that supplied vocational agriculture teachers with teaching materials. The two most important of these were the local county agents and the U.S. Forest Service.

3148. FREEH, LAVERN ADAM. Characteristics and Influence Patterns of Students Enrolling in Agricultural Curricula at Michigan State University. Dissertation, Ph. D., 1962, Michigan State University. 118 p. Library, Michigan State University, East Lansing.

*Purpose.*—To identify and compare some characteristics of farm youth who attend college, and of nonfarm youth who attend college and enroll in agricultural curriculums. Emphasis is given to the students' attitudes toward agriculture, their exposure to information about college curriculums and/or careers, and cognitive factors associated with their college curriculum choices.

*Method.*—Three hundred and thirty-nine first-term, male, freshman students enrolled at Michigan State University in the fall of 1962 were included in the study. They were divided into three groups: Farm youth enrolled in agricultural curriculums; nonfarm youth enrolled in agricultural curriculums; and farm youth enrolled in other than agricultural curriculums. The students were classified as "farm" or "nonfarm" youth through the use of criteria which were developed specifically for the study. Data for the study were gathered in group meetings through the use of a questionnaire. The three groups were compared by use of the chi-square and t-test techniques.

*Findings.*—Significant differences were found among the three groups. Farm youth enrolled in agricultural curriculums, when compared with the other two groups of students, more often reported that the adults they admired most were in agricultural occupations, their closest friends were aspiring to agricultural careers, and their first career choice was farming. They had studied vocational agriculture in high school, had participated in FFA and 4-H, had a good understanding of career opportunities in agriculture, had read agricultural careers publications extensively, had done some reading in publications dealing with agricultural curriculums, had heard a speech about careers and college curriculums by a college faculty member, and rated vocational agriculture teachers as having exerted the greatest influence on their college curricular choice after parents. Farm youth enrolled in agriculture rated the vocational agriculture course, speeches and publications about agricultural curriculums and agricultural careers, visits to the college campus, and experiences in the FFA high as sources of influence on their choice of college curriculums.

Significant differences between the two groups of farm youth were: Farm youth enrolled in agriculture more often reported that their parents were full-time farmers, that they felt agriculture was a growing industry, and that career opportunities in agriculture were expanding than did farm youth who were not enrolled in agriculture. Farm youth enrolled in agriculture reported more exposure to information about agriculture. Farm youth in other than agricultural curriculums rated teachers (other than vocational agriculture), high school counselors, high school courses (other than vocational agriculture), rank in high school class, publications dealing with

nonagricultural careers and curriculums and goals and objectives not directly related to agriculture, higher as sources of influence relative to their choice of curriculums.

Significant differences between farm and nonfarm youth enrolled in agricultural curriculums were as follows: Farm youth chose their curriculums later in high school than nonfarm youth. Nonfarm youth more often reported that employers, adults other than parents or teachers, and college faculty members had influenced their curricular choice, reported that their fathers had encouraged them to continue their education, that their parents didn't care what occupation they entered as long as they liked it, and classified the career they were preparing for as related to agriculture rather than agriculture itself.

Farm and nonfarm youth enrolled in agriculture did not differ significantly with respect to their attitude toward agriculture. Likewise both groups indicated that a liking for plants and/or animals and an interest in working out-of-doors exerted a high influence on their choice of curriculums.

3149. FULLER, GERALD ROSS. The Relationship of Characteristics of Prospective Teachers and Student Teaching Effectiveness in Agricultural Education. Dissertation, Ed. D., 1963, Cornell University. 388 p. Library, Cornell University, Ithaca.

*Purpose.*—To determine if predictors, selected from those found previously to be significantly related either to student teaching or to teaching effectiveness, could be assembled into a single instrument which, when applied to a group of students just prior to their student teaching experience, would increase the ability of teacher educators to foretell how effectively students would perform during actual student teaching in agriculture.

*Method.*—A mailed survey was used to ascertain the student teacher behaviors considered by teacher educators as most important in student teaching effectiveness. Eighty-two percent of all head teacher educators responded. Second, a student questionnaire was used to obtain, just prior to student teaching, the responses of 154 students in a 25-percent sample of all institutions. The responses were factor analyzed to identify student characteristics. Third, teacher educators and cooperating teachers provided evaluations of actual student teaching effectiveness and assessments of behaviors exhibited by the 154 students. Two teaching situations were observed, classroom teaching with in-school pupils and individual on-farm instruction with an adult. Fourth, a multiple regression analysis was used to ascertain the relationships of the student characteristics with student teaching effectiveness and student teacher behaviors.

*Findings.*—Teacher educators considered 17 behavior patterns to be critical in determining student teaching effectiveness in the classroom situation. Teacher educators considered six behavior patterns to be critical in determining student teaching effectiveness in the adult situation. The student questionnaire could be used to ascertain 12 factors or student characteristics, 3 each in the areas of background, interest, personality, and attitude.

Extremely effective student teachers were observed most frequently to exhibit behaviors characterized as fair, kindly, alert, attractive, responsible, steady, and poised. Below-average student teachers were observed most frequently to exhibit behaviors characterized as evasive, dull, stereotyped, uncertain, disorganized, inflexible, and narrow.

A positive relationship existed between extremely effective student teaching and factor scores for interest in self and society, attitude toward pupils, and personality factor PI. Negative correlations existed for factor scores PII, PIII, and attitude toward pupils. A positive relationship was found to exist between below-average effectiveness and factor scores for participation in organizations, interest in self and society, attitude toward pupils, and factor PII. Negative correlations existed for factor scores PI, PIII, age, and farm experience.

The correlation of actual and predicted student teaching effectiveness was four times greater when based upon student characteristics than when based upon teacher educator predictions.

3150. FULLER, ROBERT DEAN. Delegation of Responsibilities in a Multiple-Teacher Department of Vocational Agriculture. Thesis, M. Sc., 1963, The Ohio State University. 101 p. Library, The Ohio State University, Columbus.

*Purpose.*—To identify some important procedures that have been used successfully in multiple-teacher departments in the delegation and division of the responsibilities for classroom and shop teaching, the Future Farmers of America, farming program supervision, adult work, and administrative areas of the program.

*Method.*—One hundred and eight questionnaires were received from teachers in multiple-teacher departments in 13 States in the North Atlantic and north-central regions reporting their opinions about how to determine and divide responsibility in multiple-teacher departments. Teachers responded similarly regardless of amount of experience or State in which they were located.

*Findings.*—According to the opinions expressed, all teachers in the department should have some part in advising the FFA, help determine the teacher responsibilities, take part in school and community activities, and work with other agricultural agencies.

Each teacher should have some high school, young or adult farmer responsibility; help develop the yearly and long-range plan for the department; and file material, handle publicity, select references, help prepare the departmental budget, and work with the advisory committee.

One teacher should be designated as the head teacher or program coordinator and be assigned each report.

Other findings were that team teaching is a desirable method of handling the instructional program of the high school, of the young farmer, and of the adult farmer responsibilities; teachers should visit the students they have in class; and students within a department should be graded according to similar standards.

3151. GADDA, HILDING W. An Evaluation of the Pre-Service Program of Teacher Education in Agriculture at South Dakota State College. Dissertation, Ed. D., 1963, Michigan State University. 230 p. Library, Michigan State University, East Lansing.

*Purpose.*—To (1) determine the extent to which the preservice program is achieving the outcomes anticipated by its objectives; (2) measure the extent to which the program outcomes are consonant with the needs of beginning teachers of vocational agriculture; and (3) develop a proposal for the improvement of the program.

*Method.*—A list of 160 beginning teacher competencies was prepared in the form of a rating scale, classified in 3 main areas and further subdivisions called competency categories. Rating Scale A measured actual competency development, and Rating Scale B measured the recommended extent of development. The groups responding to the rating scales were composed of 66 beginning teachers of vocational agriculture who were graduated at South Dakota State College from 1956-57 to 1960-61, their school administrators, and the supervising teachers who directed their student teaching. Perceived competency and importance responses were checked on each of the two 3-point scales. Competency indexes and importance indexes were computed by using weighted frequencies. Chi-square was used to determine significant differences, at the .05 level, among the responses of the three groups on Scale B. Four measures of developmental adequacy were determined by computing the difference between the mean competency index and the mean importance index of each listed competency, and computing the standard deviation of the differences. Attitudes of 631 students of the beginning teachers were surveyed, using a Likert-type form.

*Findings.*—Responses revealed considerable variation in levels of competency development.

Competencies most adequately developed had mean indexes 46 percent higher than those least adequately developed. The four best developed categories were associated with establishing and maintaining relationships and advising the FFA. Competencies least adequately developed were those pertaining to performing guidance services, teaching young and adult farmers, conducting a public relations program, and teaching in-school classes and supervising farming programs.

Significant differences among the recommended development responses of the three groups were found for 10.6 percent of the competencies listed. Students of the beginning teachers generally were satisfied with the program their teachers developed and with their relationships with their teachers.

No drastic revision of the program objectives was indicated. However, the need for improvement in the means utilized in realizing the objectives was apparent. Professional laboratory experiences, curriculums, and faculty for professional education were identified as needing improvement of greatest urgency. The proposal for improvement also included organization and administration, student personnel programs and service, and facilities and instructional materials.

3152. GALLOWAY, R. EDWARD. A Comparison of the Readability of Vocational Agriculture Reference Books With the Reading Ability of the Students Using Them. Dissertation, Ph. D., 1960, Purdue University. 122 p. Library, Purdue University, Lafayette.

*Purpose.*—To compare the readability of widely used agricultural reference books with the reading ability of vocational agriculture students.

*Method.*—One high school with an enrollment of over 100 students and 1 high school with an enrollment of under 100 students were chosen in each of the 12 vocational agriculture districts in Indiana. The Dale-Chall Readability Formula was used to measure the reading difficulty of 10 agricultural reference books in the libraries of these schools. Two tests were used to measure the reading ability of the vocational agriculture students: Reading Comprehension (the Cooperative English Tests, Test C1), and Ability to Interpret Reading Materials in the Natural Sciences (Iowa Tests of Educational Development, Test 6).

The book readability means and standard deviations were converted to grade-level units, as were the reading test scores. This made it possible to compare book readability with student reading ability as measured by the two reading tests.

*Findings.*—In interpreting the following conclusions, the limitations imposed by the

design and measurements used in this study should be kept in mind.

1. In general, reading ability did not differ with respect to school size and location.
2. In general, verbal mental ability did not differ with respect to school size and location.
3. Nonverbal mental ability varied widely among individual schools.
4. Reading ability varied widely both among classes and within classes at a given grade level.
5. Students of vocational agriculture scored from one to two grade levels higher on the Iowa test of reading in the natural sciences than they did on the Cooperative reading test.
6. Vocational agriculture students in all four high school grades had mean reading abilities which ranged from normal to three grade levels below their peers on the basis of publishers' norm groups.
7. Although there was wide variation from school to school in the mental ability of vocational agriculture students, in general, their mental ability was similar to that of their peers as reported by publishers' norm groups.
8. In general, the agricultural reference books used by the students in all four high school grades of vocational agriculture tended to be too difficult for their reading ability.

X 3153. GIBSON, ROBERT HARMON. Effects of Nonvocational Loads on Programs of Instruction in Vocational Agriculture in Tennessee. Dissertation, Ed. D., 1963, University of Missouri. 137 p. Library, University of Missouri, Columbia.

*Purpose.*—To measure the effects of an administrative arrangement called a pilot program on local school programs of instruction in vocational agriculture.

*Method.*—Twelve departments in which the instructors were scheduled to teach vocational agriculture only part-time in 1961-62 were selected. The pilot program consisted of having an additional teacher employed in each school to take the nonvocational assignments otherwise handled by the teacher of vocational agriculture. Thus, in the pilot departments the teacher had full-time to devote to vocational agriculture.

All 136 remaining part-time departments were screened in order to select those most similar to the pilot departments. Twenty-four control departments were selected after the calculation of .05 confidence limits for 22 criteria showed them to be not unlike the pilot departments. A discriminant analysis of eight criteria common to the pilot departments and the control departments confirmed the likeness of the two groups. The major

difference between the two sets of departments was that the teachers in the control departments continued with nonvocational loads, whereas in the pilot departments nonvocational loads were removed.

Twenty-one evaluative criteria were selected from among those available through State reports. Data on these criteria were analyzed for 1960-61, the year before the pilot program, and at the end of the study for the year 1961-62.

Additional measures of the effectiveness of the program were obtained by means of questionnaires and by interviews with teachers and principals.

*Findings.*—Pilot departments exceeded the control departments in the following areas: Number of out-of-school classes taught, rating of FFA chapter, and investment in farming.

Teachers in the pilot departments indicated that they devoted more time to farm mechanics, guidance, adult farmers, young farmers, FFA, instruction in soils and livestock, records, supervised work experience, program planning, class preparation, and professional improvement. They spent less time with extracurricular assignments.

Both teachers and principals said that the advantages of the pilot program far outweighed the disadvantages, from the standpoint of the school and the community. They also cited personal advantages from the program.

3154. GONZALEZ, CRESCENCIANO. A Comparison of Methods of Instruction Utilized in Adult Farmer Classes for Teaching the Proper Use of Insecticides, Fungicides and Herbicides in Coffee Production in Puerto Rico. Thesis, M. Ed., 1962, The Pennsylvania State University. 75 p. Library, The Pennsylvania State University, University Park.

*Purpose.*—To test the null hypothesis that there is no significant difference among methods of teaching coffee production in Puerto Rico as measured by the adoption of approved practices and the acquisition of certain knowledge about the use of insecticides, fungicides, and herbicides.

*Method.*—Full-time adult farmer instructors and specialists in coffee production were used. In 4 schools the instructors taught 6 lessons on the same subject matter to an adult farmer class of approximately 18 farmers, using different methods of instruction. Method A was lecture and demonstration, including on-farm instruction. This method did not include provision for teaching aids to be given by the investigator. Method B included lecture, demonstration, and on-farm instruction. All teaching aids used were provided by the investigator. Method C consisted of small group demonstration and on-farm instruction.

No formal classroom instruction was given, but a period of general discussion was conducted. All teaching aids used were supplied by the investigator. Method D included the use of specialists and on-farm instruction. The first and last classes were taught by the adult farmer instructor and the other four classes by the specialists. Teaching aids were provided by the investigator to the teacher. No teaching aids were given to the specialists.

A 30-item true-false test and a 14-item multiple-choice test were constructed and administered to the four groups of farmers as a pretest and as a posttest to determine their knowledge of the subject matter. A list of 14 approved practices was prepared and used as an initial survey a week before the study began and as a final survey 5 months after completion of the specified instruction period.

*Findings.*—Tests of the null hypothesis relative to knowledge of subject matter are summarized as follows:

1. There was no significant difference in the level of knowledge of farmers in the four schools, as measured by the pretest.
2. The mean scores of the four groups of farmers on the post-test were found to differ significantly. The null hypothesis was rejected. The low score was in Group A. Methods B, C, and D did not differ. Teaching of the proper use of insecticides, fungicides, and herbicides in coffee production in Puerto Rico is less effective when teaching aids are not provided to the teacher.

Tests of the null hypothesis relative to adoption of approved practices are summarized as follows:

1. The mean scores of the four groups of farmers on the initial approved practices survey were not significantly different.
2. The mean scores of the four groups of farmers on the final survey of approved practices were found to differ significantly. The null hypothesis was rejected. The low score was in Group A, the class not furnished the teaching aids.

3155. HALL, DONALD E. Needs of In-service Teachers of Vocational Agriculture in Technical Agriculture. Thesis, M. Ed., 1962, Colorado State University. 147 p. Library, Colorado State University, Fort Collins.

*Purpose.*—To identify the needs of Kansas vocational agriculture teachers in keeping up-to-date in technical agriculture information and skills and to discover effective procedures for meeting these needs.

*Method.*—Data for this study were secured by means of a questionnaire sent to the 201 in-service teachers of vocational agriculture

in Kansas during the 1960-61 school year. The 143 usable questionnaires returned were the source of information used in this study.

*Findings.*—Ninety-six percent of the 143 Kansas teachers of vocational agriculture used Cooperative Extension Service, experiment station, and U.S. Department of Agriculture publications during 1960-61. Teachers were spending 3.75 hours per week reading agricultural publications but indicated that almost 7 hours would be necessary to keep up-to-date. Ninety-six percent of the teachers who participated in special crop and livestock meetings, tours, and field days conducted by extension specialists and county agents rated them "good" to "excellent" as a means of keeping up-to-date.

Subjects in which the need for technical information was the greatest were: Weed control, cultural practices, moisture conservation, farmstead layout, landscaping, livestock rations, livestock disease and parasite control, livestock selection, record keeping and analysis, income tax, economics of farm equipment, hydraulics, electricity, and welding.

In an evaluation of means for keeping up-to-date, teachers rated off-campus courses conducted by technical personnel from Kansas State University as being the most effective. Other high ratings included a screening-reviewing service, summer conferences, agricultural publications, evening meetings, 1- or 2-week summer session courses, and Cooperative Extension Service tours and field days.

3156. HALTERMAN, J. J. Technicians in Agriculture. Staff Study, 1962, California State Department of Education. 50 p. Bureau of Agricultural Education, Sacramento.

*Purpose.*—(1) To establish a definition of the term "technician" in agriculture; (2) to identify types of technical workers in California agriculture; (3) to determine their educational needs; and (4) to set up guidelines for curriculum development if such a need were found.

*Method.*—Data were gathered by questionnaires from 127 of the 305 business firms engaged in businesses related to agriculture in 5 central California counties. In addition, 62 operators of agriculture businesses were interviewed by the project director personally.

*Findings.*—It was found that there were many workers in agriculture who, according to the definition developed, could be classified as technicians and that these individuals had special educational needs. A total of 155 job titles and positions were identified. There were 312 agricultural technicians employed by the companies involved in the study. These men were employed as technicians in the following major areas: Veterinary services, agricultural public service, sales, field production, research, laboratory services, engineering,

communications, business, landscape, and nursery service.

The majority (85 percent) of the technicians were in the business and service phases of agriculture with only 15 percent employed in production agriculture. The largest single group (42 percent) were in the general field of agricultural services.

The training needed by technicians in agriculture could well be given at the post-high-school junior college level and, in addition to preparation in appropriate fields in agriculture, should include preparation in applied mathematics, basic sciences, and social sciences. The author concluded that there were job opportunities for agricultural technicians and that special preparation was needed for this work.

3157. HAYLES, JASPER ASBERRY, JR. Occupational Experiences of High School Graduates Who Completed Four Years of Vocational Agriculture in Louisiana. Dissertation, Ph. D., 1963, Louisiana State University. 165 p. Library, Louisiana State University, Baton Rouge.

*Purpose.*—To determine some of the occupational experiences of high school graduates who had completed 4 years of vocational agriculture, and to identify some factors that influenced the choice of occupations entered by former students of vocational agriculture.

*Method.*—Graduates of selected high schools in Louisiana who had completed 4 years of vocational agriculture were included. The bases for selecting the high schools were: (1) The teacher of vocational agriculture must have taught continuously at the same school since the 1949-50 school year; (2) students from the high schools selected must have completed 4 years of vocational agriculture instruction; (3) students from these schools must have graduated from high school during the years 1950-1959 inclusive. Data were secured by means of a questionnaire from 1015 graduates.

*Findings.*—Thirty percent of the graduates were in farming or occupations related to agriculture and 70 percent were in occupations not related to agriculture. Many graduates returned to the farm immediately after graduation from high school, but as they became older they tended to move away from the farm. A great number of the graduates were not taking advantage of their farm experiences and training in vocational agriculture. Fourteen percent of the graduates had entered occupations related to agriculture.

The graduates who entered farming and occupations related to agriculture placed high value on all phases of the vocational agriculture training program. The training received through the program had been very useful to them in their current employment and was very influential in their decisions to enter the

occupation reported, according to their responses.

Forty-seven percent of the graduates entered institutions of higher learning. Their farm experiences and vocational agriculture training influenced 23.1 percent of the college students to major in agriculture.

The financial status of the three groups (farming, occupations related to agriculture, and occupations not related to agriculture) was fairly comparable. The farming group's estimated net worth was higher than that reported by the other two groups and this was probably due to high investment the farmers had in land, equipment, and buildings.

3158. HENDERSON, BILLIE L. An Evaluation of the Student Teaching Program in Vocational Agriculture in Oklahoma As Made By School Administrators, Supervising Teachers, Parents and High School Teachers. Thesis, M.S., 1962, Oklahoma State University. 107 p. Library, Oklahoma State University, Stillwater.

*Purpose.*—To determine the attitudes of the school administrators, supervising teachers, parents, and students in the 27 teaching centers in Oklahoma toward the vocational agricultural teacher training program conducted by the Agricultural Education Department of Oklahoma State University.

*Method.*—Students were selected at random from each of the 27 training centers. Questionnaires concerning the teacher education program in these centers were mailed to the teachers, students, parents, and administrators.

*Findings.*—The following were the most important findings of the study: (1) There was little difference in attitude among teachers, students, parents, and administrators, which indicates that the student teaching program fit well into the local community; (2) the student teaching program was beneficial to the local program of vocational agriculture; (3) each of the four groups felt that student teachers should be sent to the school each year; (4) the student teaching program had some stimulating effect upon all four of the groups surveyed, with the most stimulating effect being upon the supervising teachers; (5) a difference was found concerning the value of the student teaching program to the future of agriculture, with 62 percent of the parents, 100 percent of the supervising teachers, and 44 percent of the school administrators indicating the program was of "much value."

3159. HENSEL, JAMES WILLIAM. Relation of High School Course Work to Achievement at the Iowa State University of Science and Technology. Dissert-

tation, Ph. D., 1962, Iowa State University of Science and Technology. 110 p. Library, Iowa State University of Science and Technology, Ames.

*Purpose.*—To determine what relationships existed between certain precollege variables and achievement in the various colleges at the Iowa State University of Science and Technology. This study was one of a series and was financed in part by the Iowa Agricultural Experiment Station.

*Method.*—Two sample groups were analyzed, consisting of students who entered one of four colleges at Iowa State University of Science and Technology in the fall quarter of 1955. A 16-variable intercorrelation matrix was designed for each sample, including such items as semesters of high school course work; high school grade point average; college entrance test scores; and three measures of university achievement—the student's first- and third-quarter college grade point averages, and likelihood of graduation. An analysis of multiple regression was employed in an effort to predict achievement in the various colleges at Iowa State University of Science and Technology.

*Findings.*—In both sample groups tested, the most recent cumulative grade point average, the English placement test score, and the mathematics placement test score were the variables which were most closely correlated with the criteria of university achievement. Semesters of certain high school courses such as mathematics and science appeared to have a positive but variable correlation with achievement in the various colleges. Through an analysis of multiple regression it was determined that the high school grade point average, the English placement test score and the mathematics placement test score were relatively useful predictors of college achievement, especially in terms of first- and third-quarter college grade point averages. The values, though significant, were quite low as they applied to the third measure of college achievement, graduation tendency.

Findings in this study indicated that significant relationships existed between certain precollege variables and achievement in the different colleges at Iowa State University of Science and Technology. Once the student completed one quarter at the university, the best single predictor of future grades in college or ultimate graduation tended to be his most recent grade point average. The longer the student remained in college, the more useful the cumulative college grade point average became as a predictor of academic achievement at Iowa State University of Science and Technology.

3160. HESS, CHARLES FREDERICK. An Evaluation of Selected Factors Involved in Placing Students for Farm Work Ex-

perience. Thesis, M. Ed., 1962, The Pennsylvania State University. 48 p. Library, The Pennsylvania State University, University Park.

*Purpose.*—To determine the relative importance of selected factors involved in placing high school students enrolled in vocational agriculture on farms for work experience.

*Method.*—Twenty-nine Pennsylvania students of vocational agriculture who had spent 6 months or more working on farms in a program of supervised work experience were interviewed. Also interviewed were the farmer for whom each student worked, the student's parents, and the teacher of agriculture involved in the work experience. These persons were polled on the relative importance which they attached to 27 factors associated with placement for work experience.

*Findings.*—All factors included in the interview schedules were of sufficient importance to warrant their being considered when selecting farms and placing students for farm work experience. Of the 27 factors, 12 were common to all 4 interview schedules. Five of these factors which were ranked highest in importance were: Training and experience received by student; liability insurance on student; importance of having student and farmer discuss farm management decisions; agreement between student and farmer regarding wages, hours, holidays, etc.; and amount of wages student should receive. Transportation of the student to and from home or school to his place of work, and religion, were the 2 items that ranked lowest among the 12 common items.

All items, it was concluded, should be considered carefully by the four persons involved in the placement of a student for farm work experience before the student starts to work. The investigator suggested a written agreement, which should be practical and include many of the 27 items considered in the study.

3161. HOERNER, THOMAS ALLEN. Relation of High School Vocational Agriculture to Achievement in Agricultural Engineering Courses at the Iowa State University of Science and Technology. Thesis, M.S., 1963, Iowa State University of Science and Technology. 80 p. Library, Iowa State University of Science and Technology, Ames.

*Purpose.*—(1) To determine the relationship between semesters of high school vocational agriculture and achievement in agricultural engineering courses at the Iowa State University; (2) to determine what factors influence achievement in agricultural engineering courses; and (3) to show what relationship existed among factors commonly used in pre-

dicting success in college and achievement in courses in agricultural engineering.

*Method.*—The sample for this investigation was selected from the 2,228 students who had matriculated in the freshman class in the fall quarter of 1955. The final sample consisted of 251 male students who had completed 1 or more of 4 selected agricultural engineering courses. High school and university records were used to collect the necessary data. Seven intercorrelation matrixes were produced by adding one at a time each of seven grade and quality point average combinations from agricultural engineering courses to the following high school and college records: High school—(1) semesters of vocational agriculture, mathematics, physics and chemistry, (2) rank in graduating class, and (3) high school quality point average; college—(1) final and third-quarter college quality point averages, and (2) mathematics placement score.

*Findings.*—No significant relationship was found to exist between semesters of high school vocational agriculture and semesters of high school mathematics, semesters of high school chemistry, rank in high school vocational agriculture, and semesters of high school physics, indicating the substitution of vocational agriculture for physics in the high school curriculum.

Positive correlations, significant at the 5-percent level, existed between high school vocational agriculture and high school quality point average, final college quality point average, third-quarter college quality point average, and grade in Agricultural Engineering 254 (Metal Fabrication). Non-significant relationships were found to exist between semesters of high school vocational agriculture and grade in Agricultural Engineering 255 (Wood and Concrete Construction), grade in Agricultural Engineering 334 (Farm Power and Machinery) and grade in Agricultural Engineering 306 (Soil and Water Conservation).

Highly significant correlation existed between quality point average in Agricultural Engineering 254, 255, 334, and 306 and rank in high school graduating class, high school quality point average, final college quality point average, mathematics placement test score, and third-quarter quality point average.

In comparing semesters of high school courses with the tendency to graduate from college, it was found that the students who were graduated had completed .45 more semesters of high school vocational agriculture and .38 more semesters of mathematics than the students who were not graduated from college. The differences in mean semesters of physics and chemistry were .16 and .04, respectively, in favor of students who were graduated. Semesters of high school vocational agriculture and mathematics both yielded positive correlations significant at the 5-percent level, whereas semesters of chemistry and physics yielded non-

significant coefficients of correlation when compared to final college quality point average.

3162. HOLLINGER, DANIEL M. A Study of the Safety Programs of Ohio Future Farmer Chapters. Thesis, M. Sc., 1962, The Ohio State University. 58 p. Library, The Ohio State University, Columbus.

*Purpose.*—To learn the extent and manner of chapter participation in each safety program, and suggested improvements to aid the local chapter.

*Method.*—Questionnaires were sent to the 317 Future Farmer chapters in Ohio. The data sought were in the areas of corn harvest safety, farm power safety, community improvement, highway safety, and hunter safety. The questions in each safety area pertained to teaching aids received, areas taught, amount of publicity utilized, and the accomplishments. The teachers were asked to evaluate each area as to desirable features and criticisms, and to make suggested improvement. One hundred questionnaires were returned and analyzed. A statistical comparison between chapters was made.

*Findings.*—Of the 100 teachers reporting, 96 taught corn harvest safety, 44 taught farm power safety, 28 conducted the community improvement project, 28 conducted the highway safety program, and 43 taught the hunter safety course.

Some teachers suggested that the corn harvest safety unit be extended to include all farm machinery. The findings indicated that the farm power and community improvement areas were too broad for efficient teacher supervision and it was therefore suggested that these programs be limited to the student's home farm. Highway safety received the highest number of criticisms from the teachers and was felt to be outside of the concern of the vocational agriculture program. The limiting factor of the hunter safety course was that a National Rifle Association instructor was required.

3163. HOLMBERG, DONALD R. Factors Affecting Job Satisfaction of Vocational Agriculture Teachers. Thesis, M. Ed., 1962, Colorado State University. 85 p. Library, Colorado State University, Fort Collins.

*Purpose.*—To determine the factors affecting job satisfaction, and the degree of satisfaction with certain factors found in the jobs of vocational agriculture teachers in Nebraska.

*Method.*—A questionnaire containing 99 selected factors affecting job satisfaction of vocational agriculture teachers was developed. Copies were sent to 140 vocational agriculture teachers in Nebraska during the 1960-61 school

year, and 112 usable returns were received. The teachers rated each factor as to the degree of job satisfaction they felt existed in their particular job situation in relation to these factors.

*Findings.*—A large majority of the teachers expressed feeling ranging from "satisfaction" to "high satisfaction" with the following factors: Size of classroom and its physical facilities; relationship with other teachers in the school system; 12-month employment and vacation period; cooperation from other agriculture teachers; importance of, and personal interest in, the profession; opportunity for working with rural people; and the aspects of social and community acceptance experienced by vocational agriculture teachers in relation to the program.

A majority of the teachers expressed moderately high satisfaction with these factors: Equipment and physical shop facilities; extracurricular duties performed; cooperation and support from boards of education and administrators; freedom to demonstrate initiative and creativeness; size of the community; agriculture of the community; and living conditions.

Dissatisfaction was expressed by a majority relative to the following factors: Shop storage space; salary schedules and annual increments; tenure and retirement policies; advisory councils; and security and opportunity for advancement offered by the vocational agriculture teaching profession.

3164. HOLT, ORIS M. A Study of the Vocational Agriculture Adult Education Program as Conducted by the Texas Education Agency Adult Specialists. Dissertation, Ed. D., 1962, University of Houston. 220 p. Library, University of Houston, Houston.

*Purpose.*—To determine: (1) Changes made in the adult education program by teachers of vocational agriculture who were conducting some type of adult program before sponsoring short courses, and the extent to which the short courses influenced the decision to make such changes; (2) the influence the short courses had on teachers of vocational agriculture who did not conduct adult programs before sponsoring short courses, in terms of providing some type of organized instructional programs for adults after sponsoring short courses; (3) the effectiveness of the instruction by the specialists in terms of how and to what degree the instruction met the needs of the adults enrolled, and the kind of instructional program desired by farmers and ranchers if available to them; and (4) the influence the sponsorship of the short courses had had on the school and community in terms of attitudes and increased support for the vocational agriculture program.

*Method.*—Questionnaires were mailed to all teachers of vocational agriculture in Texas who had sponsored one or more short courses, and to a stratified random sample of farmers and ranchers who had completed one or more of the eight different types of short courses conducted. The data were processed by the Data Processing Center, Texas A. & M. College, and presented in tables.

*Findings.*—Seventy-eight percent of the teacher respondents who were conducting some type of organized instructional programs for adults replied that changes had been made in types of programs offered. Most of the changes were reflected in the addition of a concentration of training for common-interest groups in addition to the general meetings previously held. These respondents replied that the short courses had influenced their decisions to make from 75 to 100 percent of the changes. All the teacher respondents who had not conducted organized adult programs prior to sponsoring short courses indicated they had organized such programs after sponsoring the short courses to provide a concentration of training for adults. They also replied that the short courses were a major factor in their decisions to provide such training.

A high percentage of the farmer and rancher respondents replied that the short courses were successful in meeting the needs as outlined by the objectives of the courses, and they preferred additional training provided by the teacher of vocational agriculture on a short-course basis to any other type of training that might be available to them.

The sponsorship of the short courses had contributed materially to the understanding of both the farm and nonfarm groups in the community as to the role of the teacher of vocational agriculture in the community, as well as the faculty and administration of the local school district.

3165. HOPKINS, H. PALMER. Professional Relations of State Leaders in Vocational Agricultural Education. Dissertation, Ed. D., 1963, The George Washington University. 194 p. Library, The George Washington University, Washington, D.C.

*Purpose.*—To: (1) Identify the activities engaged in by State leaders of vocational agriculture teachers to promote better professional relations with school administrators and State leaders of other agencies and organizations dealing with farm people; (2) determine differences in the activities of State leaders of agriculture teachers in the various regions of the United States; and (3) make recommendations for the improvement of these activities.

*Method.*—One hundred and sixteen activities were analyzed, showing the extent of use and effectiveness with four specific groups,

namely, State school administrators, local school administrators, State leaders of non-governmental organizations in agriculture, and State leaders of governmental farm agencies.

Data utilized in this study were secured by means of a questionnaire mailed to head teacher educators in colleges and universities where agriculture teachers are prepared and to head State supervisors of vocational agriculture.

*Findings.*—The study revealed 84 practices and procedures that were being used extensively by more than 50 percent of the respondents. However, some of the practices most effective for individuals were little used by the majority. Professional relations activities used with school administrators were more extensive and more standardized than those used with State leaders of agricultural organizations and agencies. The practices used in the various regions of the United States were surprisingly alike. Significant differences were found in only 15 instances out of 736 comparisons. Reasons for the differences were not found.

While State supervisors and teacher educators were combined for the purpose of this study, sufficient differences in their approaches to professional relations warrant future separate studies. Twenty-five activities were noted in which major differences existed between the two groups.

3166. HUDSON, C. JORDAN, Jr. *Procedures for Providing On-Farm Instruction for In-School Students of Vocational Agriculture in Virginia.* Thesis, M.S., 1962, Virginia Polytechnic Institute. 89 p. Library, Virginia Polytechnic Institute, Blacksburg.

*Purpose.*—(1) To determine (a) the extent to which teachers of vocational agriculture in Virginia were providing on-farm instruction for in-school students of vocational agriculture, (b) the effectiveness of the procedures being used, and (c) the major difficulties encountered; and (2) to develop suggested procedures for teachers to use in providing on-farm instruction as a part of the total instructional program for in-school students of vocational agriculture in Virginia.

*Method.*—Data were secured by questionnaires from 157 teachers of vocational agriculture in Virginia who had taught vocational agriculture for 1 year or more.

*Findings.*—The average teacher had been teaching 14.5 years; had taught 40.9 students, with a range of 7 to 102 students per teacher; and had traveled 10.4 miles one way for each farm visit.

The vocational agriculture teachers made an average of 138.8 farm visits annually per teacher, with a range of 31 to 366, and made an average of 3.7 farm visits to each in-school

student per year, with a range of 0.6 to 10.3. The average length of farm visit per student in all four classes of vocational agriculture was 72.5 minutes, with a range of 15 to 180.

Of the 56 procedures investigated, 1 procedure which was rated "very effective" and 32 which were rated "above average" in effectiveness were used by more than 75 percent of the teachers. Seven of the procedures which were rated "above average" were used by 50 to 75 percent of the teachers. Nine of the procedures which were rated "above average" and seven which were rated "average" in effectiveness were used by less than 50 percent of the teachers.

Six difficulties in providing on-farm instruction were encountered by more than 75 percent of the teachers.

The procedures which were rated "above average" or higher in effectiveness and were used by 50 percent or more of the teachers should be used as guides by all teachers of vocational agriculture in Virginia in providing on-farm instruction.

3167. JABRO, SALIM H. *Curricula in Agricultural Education at the Land-Grant Colleges and State Universities in the United States.* Dissertation, Ph. D., 1962, Iowa State University of Science and Technology. 270 p. Library, Iowa State University of Science and Technology, Ames.

*Purpose.*—(1) To analyze the curriculums in agricultural education of 43 land-grant institutions in the United States to determine similarities, differences, innovations, and trends in general education, technical agriculture, and professional education courses, and credits required for graduation; (2) to determine the professional participation experience provided the agricultural education trainees; and (3) to obtain recommendations for the improvement of future programs.

*Method.*—Questionnaires returned by the heads of agricultural education departments in 43 institutions were the major source of information.

*Findings.*—The credits recommended for graduation varied among the regions from a median of 132 to 141.5 semester credits. This was in comparison to 133 to 143 credits in present curriculums. The number of credits recommended in general education varied among the regions from medians of 50 to 61 credits. This was in comparison to medians of 56.5 to 59 credits in present curriculums. In technical agriculture regional medians of 53 to 56 credits were recommended. Medians of 55 to 58 credits were required in present curriculums. Regional medians of 20.5 to 26 credits in professional education were recommended. Medians of 21 to 26 credits were presently required.

In the main the curriculums were thought to be adequate in 35 or more of the 43 institutions in the areas of animal nutrition, basic soils, botany, basic communications, chemistry, directed student teaching, and methods of teaching vocational agriculture in high school. The weaknesses found appear to justify the following recommendations: (1) Improve the quality of teaching and the content of courses; (2) provide more specialization and flexibility in the selection of courses by students in fields of technical agriculture; (3) lengthen the student teaching period; (4) improve methods used in selecting prospective teacher candidates; (5) establish follow-up programs for beginning teachers; (6) provide more adequate instruction in the areas of farm management, farm accounting, methods of teaching farm mechanics, farm machinery, buildings and equipment, crop production, forage crops, soil management, poultry, dairy, swine, beef and sheep production and marketing, college mathematics, physics, adult and young farmer education, summer experience, and counseling and guidance techniques.

X 3168. JARMIN, MARTIN V. Prediction of Success in the Student Teaching Program for Prospective Teachers of Vocational Agriculture at the New York State College of Agriculture at Cornell University. Dissertation, Ph. D., 1963, Cornell University. 99 p. Library, Cornell University, Ithaca.

*Purpose.*—(1) To determine the relationship between success in the student teaching program in vocational agriculture and selected measures of previous achievement and experience in high school and in college; and (2) to compute equations for predicting success in student teaching in vocational agriculture on the basis of these measures.

*Method.*—The selected measures of previous achievement and experience were correlated with the criterion of success which was the weighted average grade in three Rural Education courses taken by prospective teachers of vocational agriculture during their student teaching program. To compute prediction equations, the sample was divided into two groups, the "earlier" or "A" group and the "later" or "B" group. Three pairs of multiple-regression equations corresponding to three levels or stages of prediction were computed from each group. Equations derived from Group A were used to predict success of individual members in Group B and vice versa. The predictors or independent variables selected were: Elementary Algebra ( $X_1$ ); General Science ( $X_2$ ); H.S. English ( $X_3$ ); Ohio Psychological Test ( $X_4$ ); Cornell Mathematics Test ( $X_5$ ); Cooperative Science Test ( $X_6$ ); Farm Practice credits

( $X_7$ ); First Year College Average ( $X_8$ ); and Second Year College Average ( $X_9$ ).

*Findings.*—The coefficients of correlation, which were significant at the 5-percent level, between the criterion of success and measures of previous achievement and experience were: 0.29 for second-year cumulative college average grade; 0.27 for the number of farm practice credits; 0.23 for average grade in vocational agriculture; 0.21 for first-year college average grade; and 0.21 for Regent's grade in high school physics. Other measures of high school achievement and experience were not significant. The college standard entrance tests correlated as follows: 0.00 for the Ohio Psychological Test; -0.01 for the Cooperative Reading Test; -0.02 for the Cooperative Science Test; and -0.13 for the Cornell Mathematics Test.

3169. JONES, CLAIR STERLING. A Follow-Up Study of Graduates in Vocational Agriculture in Mercer County. Thesis, M. Sc., 1962, The Ohio State University. 73 p. Library, The Ohio State University, Columbus.

*Purpose.*—To identify the following: (1) The occupations in which high school graduates of vocational agriculture have been engaged; (2) some factors that influenced the choice of occupations entered by those high school graduates and to find out their future plans concerning their occupations; (3) some benefits that former students had gained from vocational agriculture which contributed to their effectiveness in their present occupations.

*Method.*—A questionnaire was used to obtain information from the graduates of vocational agriculture in Mercer County, Ohio, from 1951 to 1960, with the exception of 22 graduates whose mailing addresses could not be located. One hundred and forty-four returned the completed questionnaire and 31 graduates did not respond. Background information was secured and analyzed according to the 1961 occupational status of the graduate.

*Findings.*—The occupational status showed 35 percent of the 144 graduates were employed in nonfarm occupations; slightly over 26 percent were full-time farmers; 17 percent were part-time farmers; 13 percent were engaged in farm-related occupations; 6 percent were attending college; and 2 percent were serving in the armed forces. Most of the graduates engaged in full-time farming became established in farming through partnership agreements with their parents, within a year after graduation. The two highest rated factors in choosing to farm were the graduates' interest in farming and their desire for rural living. The highest factors in choosing part-time farming were need for capital and not enough land. Factors such as "lack of capital," "no opportunity at home to farm," and "other good job opportunity" were rated high

by those choosing not to farm. The areas of vocational agriculture most helpful to graduates in terms of their present work were FFA activities, project record keeping, and farm mechanics.

X 3170. KERWOOD, ROBERT VAUGHN. *The Effect of Urbanization on Vocational Agriculture in Jackson County, West Virginia.* Thesis, M.S., 1963, West Virginia University. 87 p. Library, West Virginia University, Morgantown.

*Purpose.*—To determine the role of vocational agriculture when industry moves into a rural area, using Jackson County, West Virginia, as a basis for study.

*Method.*—Twenty-five citizens of Jackson County were interviewed to determine agricultural changes since 1955, areas of agriculture needing most attention, and methods of instruction considered most effective. Census data were studied for social changes. Information was obtained by mailed questionnaires for the home farms of 65 vocational agriculture students. Three Jackson County Vocational agriculture teachers were interviewed.

*Findings.*—It was found that major changes in agriculture were: fewer farms, more part-time farms, fewer dairy farms, decreased agricultural production, and greater maturity of farmers. Areas needing most attention were: Marketing, pasture improvement, meadow improvement, part-time farming, and small fruit production. Methods of instruction most effective were: On-the-farm supervision, demonstrations, newspapers, classes, and bulletins.

Social changes noted were: Population increased; births increased; assessed property increased; welfare payments decreased; personal income went up; and enrollment in schools went up, but the increase in money spent on schools did not keep up with increased personal income. Examination of the status of home farms of students in vocational agriculture revealed: A large percentage of part-time farms; few dairy farms with meadows not adapted to hot, dry summers; and few truck farms.

Teachers of vocational agriculture in the county observed that the trend toward urbanization has been accompanied by an increase in general shop courses offered and in high school science credits required. They expressed belief that increased emphasis should be given to agricultural science and mechanics as farm-related occupations become more important.

X 3171. KIRRY, ALGEE G. *Audio-visual Instructional Needs of a Selected Group of Teachers of Vocational Agriculture in Arkansas.* Dissertation, Ed. D., 1963, University of Missouri. 146 p. Library, University of Missouri, Columbia.

*Purpose.*—To determine the audiovisual instructional needs of 60 Negro teachers of vocational agriculture in Arkansas.

*Method.*—The literature pertaining to inservice audiovisual training was reviewed. An analysis was made of books, bulletins, and periodicals pertaining to inservice audiovisual training of teachers. Transcripts of Negro teachers of vocational agriculture in Arkansas were reviewed to determine audiovisual courses taken. The college bulletin was checked to determine content of preservice courses for agriculture majors. Fifty-five of the 60 Negro teachers of vocational agriculture were interviewed.

*Findings.*—Training in the preparation and use of audiovisual materials was reported by 55 percent of the teachers. Forty percent reported they used projection equipment and prepared instructional materials while enrolled for student teaching as undergraduates.

The chalkboard ranked above all other frequently used media. The bulletin board ranked second. Flannel graphs, handmade transparencies, mock-ups, models, flannel boards, and flat pictures were used less frequently than other audiovisual materials.

Next to chalkboards, which were found in all departments, charts, filmstrips, and slides were reported as being in 67, 51, and 40 percent, respectively, of the departments of vocational agriculture. The 16-mm. projector was reported to be in only 20 percent of the departments. Television was not available in the departments; however, 4 percent of the teachers said it was available in the school.

Seventy-five percent of the teachers secured audiovisual material from the State Department of Education while 55 percent reported commercial producers as the source where such materials were obtained.

Only 18 percent of the teachers indicated that audiovisual workshops had been conducted in their school area within the last 3 years. Ninety-eight percent of the teachers indicated they would be interested in participating in audiovisual training programs.

X 3172. KOENE, WAYNE G. *The Relationship of Summer Programs upon the Effectiveness of the Total Vocational Agricultural Program in Wisconsin.* Thesis, M.S., 1963, University of Wisconsin. 75 p. Department of Agricultural and Extension Education, University of Wisconsin, Madison.

*Purpose.*—To determine the relationship between the strength of the summer program and the relative strength of the total vocational agriculture program and to determine correlations between the agriculture teacher's rating by supervisory personnel and factors which influence success of a summer program.

*Method.*—Data were obtained primarily from a summer program-of-work form that

each vocational agriculture instructor in the State of Wisconsin was required to submit to the State Board of Vocational and Adult Education. One hundred thirty instructors of vocational agriculture were involved. The instructors were chosen randomly from 260 instructors who filed reports in 1962. Each instructor was rated by three supervisors from the State Board of Vocational and Adult Education.

*Findings.*—The average number of days spent by the vocational agriculture instructor in Wisconsin on the summer program activities in 1962 was 57.4 days. Actual on-the-farm instruction accounted for 28.2 days. Instructors rated highest by supervisory personnel spent more time making on-the-farm visits than instructors who were rated lower.

Professional improvement activities had a positive relationship to the rating of the instructors and the extensiveness of summer program conducted. There were several weeks when the instructor was unable to pursue an active summer program because of summer school. This study indicated that vocational agriculture instructors who attended summer school conducted a more vigorous overall program than was carried out by instructors not participating in professional improvement endeavors.

The findings revealed that experience of the instructor had a connection with the rating he received. Instructors with 10 to 14 years of experience had the highest rating. The study also found that instructors with higher enrollments had higher ratings.

**3173. KOMASA, NOEL JOSEPH.** Ratings of High School Course Areas by Male Farm Graduates in Nonfarm Occupations. Thesis, M.S., 1961, Iowa State University of Science and Technology. 91 p. Library, Iowa State University of Science and Technology, Ames.

*Purpose.*—This study was made to determine the interrelationship of satisfaction, salary, and prestige of occupations of male farm graduates in nonfarm occupations, and the ratings given course areas taken in high school.

*Method.*—Twenty pairs of high schools in Iowa were selected on the basis of location, population of town, high school enrollment, soil type, nationality and religion of people, and type of farming. The investigators visited the 40 high schools to obtain information concerning the male farm graduates and to secure the names and addresses of the graduates so that a questionnaire could be mailed to each of them. A total of 1,244 questionnaires was mailed and 925 were returned.

*Findings.*—There were indications that the ratings of mathematics courses by high school graduates as being beneficial were related to

the amount of salary received. The graduates who rated the mathematics course "high" also indicated a "high" degree of satisfaction in their occupations.

The relationships between the ratings of the biological science courses and salary, the prestige rating, and the degree of satisfaction in occupations, when tested by analysis of variance, were found to be nonsignificant. Only 6 percent of the graduates rated the biological science courses as being of "very much value," whereas 48 percent rated them as being of "no value" to them.

Sixty-four percent of the total group gave a rating to the physical science courses as being "of value" to them, whereas 36 percent stated this course area was of "no value" in relation to the amount of salaries received in their occupations. There was a nonsignificant relationship between the prestige ratings of their occupations and the physical science courses.

Graduates in the high income group rated social science courses as being of more value to them than did the graduates in the low income group. A significant relationship was found between the ratings of the social science courses completed in high school and the degree of satisfaction in their occupations.

The relationships between the ratings given to the industrial arts courses by the male farm graduates and salary received, degree of satisfaction in their occupations, and prestige ratings of their occupations were all found to be nonsignificant.

Forty-two percent of the graduates in the \$5,000 or more annual salary group gave a rating of "very much value" or "much value" to vocational agriculture courses completed in high school, whereas only 29 percent of the graduates who were receiving salaries of \$4,999 or less rated them similarly. More graduates who were "satisfied" or "very satisfied" in their occupations indicated that vocational agriculture courses completed in high school were of value to them in their occupations than did those who were "dissatisfied" or "very dissatisfied." There was a nonsignificant relationship between the prestige ratings of their occupations and vocational agriculture courses.

**3174. KREBS, ALFRED H.** College Success of Students Enrolled in the College of Agriculture, University of Illinois. Staff Study, 1961, University of Illinois. 21 p. Division of Agricultural Education, University of Illinois, Urbana.

*Purpose.*—This study was made to add to the body of knowledge regarding the relationship between college success (in terms of college grades) in the University of Illinois College of Agriculture and enrollment in high school vocational agriculture.

*Method.*—All male students who enrolled as freshmen in the University of Illinois College

of Agriculture during the years 1954 through 1957 were included. There were 836 students who enrolled as freshmen during these years. Some of the students were freshmen, some were sophomores, some were juniors, and some were seniors at the time the study was made. The data used were taken from the permanent record cards maintained by the College of Agriculture. College grades, scholastic aptitude, and rank in high school class were among the factors used.

*Findings.*—Continued enrollment in vocational agriculture in high school had little effect on the amount of English, mathematics, and science taken. A majority of the students ranking high in their high school classes had taken two or more units of vocational agriculture. Students with the most credit in vocational agriculture tended to earn slightly higher average grades in college than did students with the least credit in vocational agriculture, despite no significant correlation between scholastic aptitude and units of credit in vocational agriculture. The loss of students from the College of Agriculture was least for the group of students having taken the most vocational agriculture in high school.

3175. LADDERUD, NILS ALF. Class Time Devoted to Extracurricular Activities in Four Northwest Washington High Schools. Thesis, M.S., 1962, Washington State University. 29 p. Library, Washington State University, Pullman.

*Purpose.*—The basic aim of this study was to determine the amount of class time used in extracurricular activities sponsored by four Washington State high schools. The study endeavored to point out the areas of activities which caused the greatest loss of class time and possibly the greatest interference with specific periods of the school day. The study was designed to answer the following questions: (1) How many student hours are spent out of class during the school year for extracurricular activities? (2) How is the amount of time spent divided among the various types of extracurricular activities? (3) How do the methods of operating the program of extracurricular activities differ between schools? (4) How many hours must be spent out of class by teachers in supervision of these activities? (5) How is the teacher's class handled when he has to supervise extracurricular activities?

*Method.*—Vocational agriculture teachers at the four high schools used in this study saved the daily bulletins and made notations regarding the number of students dismissed and the length of dismissal for all activities during class time for the school year 1961-62.

The amount of time spent in activities was listed in categories such as assemblies, classes and organizations, athletics, music and drama, and others. The amount of time spent in

each activity was multiplied by the number of students participating, which resulted in the number of student hours of participation. The number of dismissals for each activity and the number of student hours used were tabulated.

*Findings.*—Assembly programs used the largest total amount of time at the four schools studied. Classes and organizations used the second highest amount of activity time. The student council, senior class, and honor society were the groups using the most class time for activities. The athletic program did not use a large block of time due to the smaller number participating, but it was found that students participating in athletics would often miss the same class several times during one sport season. If a student participated in several sports he could miss the same class many times over the period of a year.

Calculation of the time used for extracurricular activities was based on the size of the entire student body in each school and it was found to range from a low of 6.49 to a high of 9.95 school days used for extracurricular activities by each student. The least interruptions and use of class time were in the largest school studied, but many of the meetings there were held during a 20-minute homeroom period.

3176. LANDON, GEORGE ALBERT. Non-farm Students Enrolled in High School Vocational Agriculture and Their Occupations Following Graduation. Thesis, M. Sc., 1962, The Ohio State University. 109 p. Library, The Ohio State University, Columbus.

*Purpose.*—To determine the number of non-farm students enrolled in high school vocational agriculture classes, some comparisons of these students' experiences in vocational agriculture with those of other students, and their occupations following graduation.

*Method.*—A survey form was provided each student enrolled in 16 selected vocational agriculture departments in northwest Ohio to determine the 1962-63 enrollment. These forms were collected and a study was made of the complete farming program reports for the years 1958-59 to 1961-62 through interviews with the vocational agriculture teachers.

*Findings.*—Twenty-two percent of the vocational agriculture enrollment in this study was from nonfarm situations. The percentage of nonfarm enrollment had increased one-third from 1958 to 1962. Of 230 students discontinuing vocational agriculture 1958-62, 20 percent were nonfarm and 44 percent from full-time farm situations.

The farming programs of nonfarm students were 74 percent production projects and 20 percent work experience compared to 98 percent production projects for full-time farm

boys. The projects of nonfarm students were reported as half as large in scope but equal in projects per boy with full-time farm students.

Nearly as many nonfarm students reported FFA activities as did full-time farm boys; however, nonfarm students reported more individual activities per boy. An equal number of elected officers was reported for both groups.

The nonfarm student occupations showed one-third in farm or related work among the 1962 graduates whereas none were reported in farm or related work among the 1959 graduates.

Three-fourths of the teachers reported changes in curriculum for teaching nonfarm students which included the addition of more shop and mechanical skills, fundamentals of learning, and other features designed to stimulate applied activity by the student.

This study recommended considering nonfarm students for enrollment providing they were willing to develop adequate experiences in farming or related occupations. Such experiences could be obtained through farming programs on farms of relatives or cooperative farmers and through use of small acreages for specialized intensive crop projects. The study also urged that special efforts be made to involve all nonfarm students in FFA activities to supplement their experiences in vocational agriculture, and that teachers be enabled more readily to exchange ideas on how the instruction of nonfarm students might become more effective.

3177. LARSHUS, LEONARD M. North Dakota Summer FFA Program. Thesis, M. Ed., 1963, Colorado State University. 139 p. Library, Colorado State University, Fort Collins.

*Purpose.*—To determine what summer FFA activities should be included in the FFA program and the amount of time North Dakota chapter advisers were spending on the various FFA summer activities.

*Method.*—Questionnaires were returned by 40 advisers of North Dakota FFA chapters and by 80 randomly selected FFA members and their fathers. Time sheets were used to determine the amount of time devoted to the summer FFA activities. Limits for the low, medium, and high groups were established on the basis of total weighted scores of 79 to 105, 106 to 130, and 131 to 156, respectively.

*Findings.*—Activities in the high group, as based on the total weighted scores of 28 activities as rated by the FFA advisers, FFA members, and their fathers were: Attending State FFA convention, holding FFA meetings, preparing for State FFA convention, training officers in leadership, promoting FFA public relations, and participating in district FFA activities.

A partial list of activities rated in the medium group were: Making home visits for FFA

activities, conducting FFA educational trips, and supervising FFA chapter farm. Those activities receiving the lowest total weighted score were: Conducting FFA cooperative livestock sales, supervising FFA custom work, and conducting varmint hunts. Approximately 64 percent of the North Dakota FFA chapters were participating in those activities rated in the high and medium bracket.

The FFA activities on which the greatest amount of the advisers' time was spent during the summer months were: Supervising FFA chapter farm or other productive projects, attending State FFA convention, professional improvement related to FFA, and making home visits for FFA activities.

3178. LARSON, WALTER E. Agriculture in Junior College. Thesis, M.A., 1961, University of Minnesota. 150 p. Library, University of Minnesota, Minneapolis.

*Purpose.*—(1) To become familiar with the junior college movement—nationally, state-wide, and locally; (2) to become acquainted with agricultural programs as a part of the total junior college program; and (3) to develop a program of agriculture for Worthington Junior College.

*Method.*—Become familiar, through extensive reading and research, with the history, growth, administration, financing, and functions of junior colleges in the United States and in the State of Minnesota, and of Worthington Junior College in particular. Review doctoral dissertations and other literature on research done in the field of agricultural curriculums in junior colleges. Collect data by means of a catalog survey on agricultural programs offered in 89 junior colleges throughout the United States. In cooperation with the University of Minnesota and the dean and agriculture instructors of the Worthington Junior College, develop an agricultural program that would meet the needs of the community and the young men served.

*Findings.*—In the 89 junior colleges surveyed, 1,293 courses in agriculture were taught. Animal husbandry offerings led the field with 264 courses, or 20.4 percent of the total offerings. Agronomy, horticulture, and agricultural engineering (which for the most part was farm mechanics) shared about the same degree of popularity with 12 percent, 12 percent and 13.9 percent, respectively. About 45 percent of the colleges were found to grant some type of award at the completion of a program in agriculture.

California was the leading State in the development of complete programs of junior college agriculture, with Modesto Junior College operating one of the broadest programs. New York and southern States such as Mississippi and Texas had extensive programs. The north-central States, where farming and other related fields of agriculture are im-

portant in the economy, had done the least in this field of education in agriculture. Inquiry into the reasons for this lack of agriculture in junior colleges in this area could be a study in itself.

People interested in agriculture were found to be concerned about the shortage of college-trained men in the field of agriculture. Probably that situation could be alleviated by having more young people use the intermediary step of the junior college agricultural programs. This might help to keep farm-reared boys interested in agriculture as a vocation and to supply the college-trained men who will be needed.

3179. LEGG, OTTO P. Programed-Instruction and Lecture-Discussion Methods Compared for Effectiveness in Teaching Agricultural Finance to Vocational Agriculture Students. Dissertation, D. Ed., 1962, The Pennsylvania State University. 90 p. Library, The Pennsylvania State University, University Park.

*Purpose.*—The experiment compared the effectiveness of programed-instruction and lecture-discussion methods of teaching agricultural finance and credit to three grade levels of vocational agriculture students, using erasure-feedback and conventional multiple-choice answer sheets.

*Method.*—The major variables were teaching method, grade level, and answer sheet. The multivariate design involved 480 students in 20 schools in Pennsylvania, Delaware, Maryland, Virginia, and West Virginia. Eight students were randomly selected in the 9th and 10th grades, the 11th and 12th grades, and the young adult farmer class level. Four in each group used the erasure-feedback answer sheet.

Teaching plans and a 53-page student information booklet were written for the lecture-discussion classes. A 106-page programed-instruction text was prepared by rewriting and arranging the subject matter into a sequence of short steps, or frames, requiring an overt response from the student. Individual differences were controlled by a reading test, Reading Comprehension, Form 2A, of the Cooperative English Tests, and by a pretest of knowledge of agricultural finance. The criterion test was administered at the close of the instruction and 2 months later as a retest.

*Findings.*—The difference in mean test scores of students taught by lecture-discussion over the programed-instruction method was significant at the .01 level by multiple classification analysis of covariance. There was no change from test to retest. Among grade levels, on both the test and retest, the 9th- and 10th-grade student scores were lowest and the young adult farmers had the highest scores. On all grade levels knowledge in-

creased from pretest to test. The retest scores of students who previously had used the erasure-feedback answer sheet were significantly higher, with young adult farmers making most of the increase.

The experiment was conducted in an environment in which the older individuals particularly were involved in experience-centered activities on the students' home farms and at the schools. The programed-instruction method may be of greatest aid to students desiring knowledge in areas of special interest in which learning experiences are not provided by other teaching procedures.

3180. LESTER, H. T., JR. and O'KELLEY, GEORGE L., JR. A Study of the Effect of Enrollment in Vocational Agriculture Classes on High School Programs of Study of Students in Georgia Schools. Staff Study, 1963, University of Georgia. 37 p. Research Series, Bulletin No. 2, Department of Agricultural Education, University of Georgia, Athens.

*Purpose.*—To compare the kinds and number of high school units of credit submitted for admission to the University of Georgia freshman class of 1960-61 by students who reported vocational agriculture units of credit and those who did not report such units, and to determine differences in college grades earned.

*Method.*—The study population consisted of all male members of the University of Georgia freshman class of 1960-61 who completed three quarters of study during the school year and who were graduates of Georgia high schools. They were classified according to whether or not high school vocational agriculture units of credit were presented for University admission and further classified according to various groupings based on combinations of high school units of credit. Earned grades were determined for specific courses and a mean grade for all freshman courses was calculated for each student. Differences between groups were computed and significance of difference by use of t-values. Where units of credit were compared, chi-square values were calculated. College Entrance Examination Board scores were obtained for each student and used in measuring variability within groups due to factors other than the grouping factor being studied.

*Findings.*—Students in the vocational agriculture groups reported significantly fewer high school units of mathematics, social studies, and foreign language than did students in the nonvocational agriculture groups. Students in the nonvocational agriculture groups reported more high school science units but the difference was not statistically significant. Students who reported as many as 4 units of mathematics or as many as 4 units of science earned higher mean freshman grades and also

had higher CEEB scores, verbal and mathematics, than did students reporting fewer units.

3181. LEWIS, LUTHER L. A Follow-Up Study of the Future Farmers of America Members Who Earned the State Farmer Degree in South Carolina from 1951 Through 1960. Thesis, M.S., 1962, Clemson College. 49 p. Library, Clemson College, Clemson.

*Purpose.*—(1) To determine the occupations of former students of vocational agriculture who earned the State Farmer Degree in South Carolina from 1951 to 1960; (2) to determine the FFA activities most valuable to them; and (3) to secure their recommendations for improving the program of vocational agriculture.

*Method.*—A list of the 952 recipients of the degree was compiled and questionnaires were mailed to the odd-numbered names. Of the 476 State Farmers surveyed, 292, or 62 percent, returned completed questionnaires. Data were taken from the questionnaires and compiled on a summary form developed for that purpose.

*Findings.*—Approximately 47 percent of the respondents were engaged in farming, while nearly 53 percent chose nonfarm occupations. Of the nonfarm respondents nearly 80 percent indicated a desire to farm in the future. Over one-half listed "lack of capital" as the reason for not farming.

Among the FFA activities of most value to State farmers were: (1) Serving as a national delegate; (2) holding office on the local or State level; (3) participating in public speaking contests; and (4) learning parliamentary procedure.

Two-thirds of the respondents made recommendations for changing the vocational agriculture program including FFA activities. Among the suggested changes were: (1) Increased emphasis on farm mechanics and shop work; (2) requirement that farm records be kept properly by all FFA members; (3) concisely written teaching calendars for vocational agriculture departments; (4) increased emphasis on farm management to develop ability to organize a business; and (5) less teacher time devoted to members of winning teams.

3182. LOVE, EDWIN L. Characteristics of Young Men Who Enter and Continue in Farming. Thesis, M. Ed., 1963, The Pennsylvania State University. 44 p. Library, The Pennsylvania State University, University Park.

*Purpose.*—To determine the characteristics of young men who continue in farming, and to compare them with young men who migrate from farming to other occupations, in order

to locate indicators of individual occupational preference to counsel both groups of rural young men more effectively.

*Method.*—Data collected in 1959 by interviews from 422 young farmers and in 1961 from 351 who were still farming in 28 Pennsylvania schools on schedules designed for the National Young Farmer Study were analyzed. Group I included the 351 young men who were still farming in 1961 and Group II included the 71 young men who left farming between 1959 and 1961. Comparisons between the 1959 data for the two groups were made on the following factors: (1) Age; (2) education: (a) highest grade completed in school, (b) years completed in high school vocational agriculture, (c) years enrolled in adult classes; (3) tenure status; (4) annual labor income; (5) farm and nonfarm work; (6) levels of living and home conveniences; (7) insurance programs; (8) sources of technical information; (9) rural attitudes; (10) production efficiency: (a) hay, corn, oats, and wheat, (b) milk and eggs; and (11) farming practices.

*Findings.*—This study indicated that: (1) Older men tended to remain on the farm, while younger men more often migrated to off-farm occupations; (2) there was no difference between groups in total grades of school completed, very few in either group had attended college, the men who had had the largest number of years of vocational agriculture (both high school and young and adult farmer classes) tended to stay in the business of farming; (3) being an owner-operator was a factor in remaining in the business of farming; (4) higher incomes appeared to encourage young men to remain in farming; (5) a smaller percentage of those who continued to farm were employed part time in off-farm occupations; (6) there was no difference in the levels of living and home conveniences of the two groups; (7) the group that continued to farm had a higher percent of participation in insurance programs; (8) teachers of agriculture were used by both groups as sources of technical information more often than any other source; (9) the group that continued to farm made a slightly higher total score on the Strausz Rural Attitude Profile, but the difference was not significant at the .05 level; (10) production efficiency was not different on hay, corn, oats, and wheat, but was higher on milk and eggs for the group that continued to farm; (11) the men who continued to farm scored a higher average score on 10 essential farming practices.

3183. McBRIDE, CHARLES HAROLD. The History of the Future Farmers of America in Tennessee. Thesis, M.S., 1962, University of Tennessee. 195 p. Library, Department of Agricultural Education, University of Tennessee, Knoxville.

*Purpose.*—The objectives were: (1) To summarize and present some experiences, conditions, and traditions which influenced the formation and growth of the FFA in Tennessee; (2) to show the influence of the early leaders on the FFA in Tennessee; (3) to reveal some of the consequences of World War II on the Future Farmer organization; (4) to show the relationship of the FFA to the total program of vocational agriculture; (5) to analyze the importance of local, State, and industrial support; and (6) to examine recent trends of the FFA.

*Method.*—Materials pertaining to the Tennessee Association of FFA were collected from published articles, mimeographed materials, and personal interviews. The information was assembled and analyzed.

*Findings.*—The FFA—the national organization of, by, and for boys studying vocational agriculture in public high schools—was organized in November 1928 to serve, motivate, and vitalize the systematic instruction of vocational agriculture, and to provide training in agricultural citizenship.

The Future Farmers of Tennessee was organized in September 1927, before the national FFA organization was founded. The first State convention was held in Nashville on April 20, 1928. At that time there were 41 local chapters with over 1,000 members. Later the Future Farmers of Tennessee joined the national organization and became the Tennessee Association of Future Farmers of America. The foundation upon which the FFA was built includes leadership, character development, sportsmanship, cooperation, service, thrift, scholarship, improved agriculture, organized recreation, citizenship, and patriotism.

During the years 1928–61 the Tennessee FFA enjoyed a steady growth, except for the war period. There were 261 local FFA chapters with over 15,000 members in 1961. The Tennessee Association is among the stronger State FFA organizations. Since 1928, 274 FFA members in Tennessee have received the American Farmer Award, highest degree offered by the national organization. Since 1946, 41 FFA chapters in the State have been honored in the National FFA Chapter Contest. Tennessee chapters have received 21 Gold Emblems, highest rating given to a local chapter; 12 Silver Emblems, second place award; and 8 Bronze Emblems, third place award.

Six FFA members from Tennessee have been elected to a national office—four vice presidents and two student secretaries. Three Tennessee FFA members reached the finals in the National Public Speaking Contest and all three placed second in the national event. Tennessee has had two Star Farmers of the South and two Star Farmers of America.

Tennessee FFA chapters have received their proportionate share of national honors. Through the interest and cooperation of the members, advisers, and others associated with

the organization, the FFA is known to almost every person in Tennessee.

3184. McCOMAS, JAMES DOUGLAS. *The Relationship of Construction Projects to the Farm Mechanics Program of Vocational Agriculture in Ohio.* Thesis, M. Sc., 1960, The Ohio State University. 64 p. Library, The Ohio State University, Columbus.

*Purpose.*—To determine: (1) Factors that influence the use of project plans; (2) the amount of time teachers devoted to various areas of instruction in farm mechanics; and (3) factors affecting the construction and use of the shop project in instruction in farm mechanics.

*Method.*—Two questionnaires were utilized in collecting the data for this study. The initial questionnaire was submitted to all Ohio vocational agriculture teachers in 1959. Responses were received from 228 of the 348 teachers. The responses were concerned primarily with the use of shop project plans and most commonly constructed projects. The second questionnaire was mailed to a one-third sample of Ohio vocational agriculture teachers. Responses received from 114 teachers provided data on the number of days used in teaching the various areas of farm mechanics, teacher judgments as to the value of shop projects, and an inventory of needed project plans.

*Findings.*—Time devoted to teaching farm mechanics ranged from 25 to 64 percent of total time available for instruction in all areas. The average number of days spent in teaching farm mechanics was: Farm power and machinery, 71.6; farm buildings and conveniences, 26.5; soil and water management, 25.8; rural electrification, 21.1; carpentry, 24.7; metal work, 45.6; and other areas, 2.3.

Farming program and other farm needs ranked first and second as factors affecting selection of shop projects. Educational needs afforded by the project were rated third. Five construction projects reported by teachers as most common were self-feeders, nail and tool boxes, sawhorses, gates, and farrowing crates, in that order. Projects receiving the highest ratings in providing educational experiences were trailers, portable hog houses, and sawhorses. Bookcases, wood floats, and bale hooks were felt to be least valuable. Teachers indicated that nearly all shop projects could best be taught during the freshman and sophomore years. Teachers reported an average annual expenditure of \$2 for shop project plans, but indicated that \$11 to \$30 should be expended annually for this purpose.

3185. McCOMAS, JAMES DOUGLAS. *The Role of the Teacher of Vocational Agriculture as Perceived by Selected Ohio Teachers and Their Administrators.*

Dissertation, Ph. D., 1962, The Ohio State University. 235 p. Library, The Ohio State University, Columbus.

*Purpose.*—To define the role of the teacher of vocational agriculture expected by selected Ohio teachers and their administrators and to determine the extent to which the expected role of the teacher was being fulfilled.

*Method.*—The study use a sociopsychological approach in analyzing and describing teachers' and administrators' perception of the role of the teacher of vocational agriculture. Seventy role-defining items concerning the teacher were included in the interview schedule. Seven additional items were used to describe the administrator's role in working with the teacher of vocational agriculture. Perceptions of expectations and performances were obtained. A measure of consensus on role definition was computed by taking the square of the difference between the individual's response to an item and the mean response for all teachers. The sum of the squared differences was the measure of consensus for each teacher. Teacher effectiveness and job satisfaction were additional dimensions of the study.

The descriptions and analysis included the perceptions of 30 selected teachers and 30 of their administrators from 11 central Ohio counties. The sample included 15 teachers rated by State supervisors as most effective, 15 of their administrators, 15 teachers rated as least effective, and 15 of their respective administrators. A middle group of "effective" teachers was eliminated from the final analysis. Personal interviews were conducted with all administrators and all teachers within the sample.

*Findings.*—Teachers rated as most effective and their administrators had greater agreement on both role expectations and performance than least effective teachers and their administrators. Teacher effectiveness was found to be positively related to job satisfaction. Job satisfaction was related to consensus on role definition among the teacher groupings. Background data revealed that teachers rated as most effective when compared with those rated as least effective were more active in community affairs, conducted more classes for young and adult farmers, earned more hours beyond their highest degree, and taught in larger schools having slightly larger enrollments in vocational agriculture. Administrators for both teacher groupings showed about the same amount of experience with programs of vocational agriculture and had comparable graduate preparation. Administrators of teachers rated as least effective had served as administrators twice the number of years as those administrators whose teachers were rated as most effective. Most effective teachers and their administrators indicated higher appraisals for 11 program areas than

did less effective teachers and their administrators.

3186. McCOMAS, JAMES DOUGLAS and others. Land and Livestock Laboratories in New Mexico and West Texas. Staff Study, 1962, New Mexico State University. 65 p. Agricultural Education, College of Teacher Education, New Mexico State University, University Park.

*Purpose.*—The purpose of this study was to determine the scope, kind of facilities available, management practices, uses, educational values, and critical problems encountered in utilizing land and livestock laboratory facilities in New Mexico and west Texas. An additional purpose was that of formulating suggested general practices and policies recommended for programs utilizing such facilities.

*Method.*—Teachers in New Mexico and west Texas known to have land and livestock laboratories were mailed questionnaires. The final sample for the study included 11 New Mexico and 23 west Texas teachers of vocational agriculture.

*Findings.*—Thirty percent of the teachers in New Mexico and nearly 50 percent of those in west Texas were utilizing land and livestock laboratories. Schools included in the sample reported laboratories averaging 11.4 acres in New Mexico and 15.6 acres in west Texas. The average distance of all laboratories from high school campuses was 1.8 miles. Responses from the 34 schools indicated that the laboratories had been in operation for an average of 7 years.

The average of hours per week that teachers spent in managing laboratory facilities during school hours was 1.8 per teacher, while the teacher's after-school time averaged 3.65 hours per week. Slightly more than one-half day per week of the teacher's time was spent in such activity during the summer.

In the 34 schools reporting land and livestock laboratories, almost 60 percent of the total student enrollment in vocational agriculture was composed of nonfarm boys.

The advantages of laboratories, in the order of rank listed by teachers, were that they provide desirable agricultural experiences, develop cooperation, offer facilities for demonstrations and individual projects, and encourage favorable publicity for the vocational agriculture program. The disadvantages, indicated in order of rank, were that they require too much of a teacher's time, work cannot always be completed at the ideal time, and the financial risk is excessive.

3187. McCracken, JOHN DAVID. Relation of High School Vocational Agriculture to Achievement in College Courses in Agronomy. Thesis, M.S., 1962, Iowa State University of Science and Tech-

nology. 77 p. Library, Iowa State University of Science and Technology, Ames.

*Purpose.*—To determine relationships between semester credits of high school vocational agriculture and achievement in college courses in agronomy.

*Method.*—Data were obtained in the Office of the Registrar and the Iowa State University Testing Bureau and processed through an electronic computer to obtain intercorrelations among the variables. Complete information was obtained for 309 male students and was then analyzed in the study.

*Findings.*—The coefficients of correlation obtained were compared with  $r$  at the 5 (.112)-percent and 1 (.146)-percent levels of significance for 309 degrees of freedom.

No significant relationship was found between semesters of high school vocational agriculture and ACE total score (-.004), mathematics placement test score (-.016), English placement test score (.059), first-quarter college quality point average (.106), final college quality point average (.062), achievement in introductory agronomy courses (.067), or the tendency to graduate from college (.050). A significant coefficient of correlation (.135) was obtained when semesters of high school vocational agriculture were compared to high school quality point average.

Highly significant coefficients of correlation were found between achievement in agronomy courses in college and all other variables except semesters of high school vocational agriculture, ACE total score, and mathematics placement test score. High school quality point average (.427) appeared to be more highly correlated with achievement in agronomy courses in college than any other variable available at the beginning of a student's college year.

In the final analysis, it appeared that the academic ability of a student, as measured by quality point averages obtained in high school and college, was more highly related to achievement in agronomy courses and to academic achievement in college than the number of semesters of vocational agriculture the student may have had in high school. It was also noted, however, that in no instance was the number of semesters of high school vocational agriculture negatively correlated with achievement in agronomy courses or with academic achievement in college.

3188. McELVEEN, JAMES DONALD. An Occupational Study of the Agricultural Graduates of Louisiana State University and Agricultural and Mechanical College, 1946-60. Dissertation. Ph. D., 1963, Louisiana State University. 250 p. Library, Louisiana State University, Baton Rouge.

*Purpose.*—To determine: (1) The occupational status of the graduates and the rela-

tionship between this status and their major field of undergraduate study; (2) the number of graduates actually engaged in the business of farming; and (3) the acceptance of agricultural graduates into the many occupational and professional jobs in agriculture as determined by the earning of economic rewards commensurate with their training.

*Method.*—A printed questionnaire was mailed to 2,239 agricultural graduates who had received Bachelor of Science degrees from Louisiana State University during the period of 1946 through 1960. Of these, 786 graduates replied and constitute the basis upon which this study was written.

*Findings.*—Approximately 52 percent of the graduates studied were farm reared, 21.4 percent were rural nonfarm reared, and 25.9 percent were city reared. One to 4 years of vocational agriculture had been completed by 44 percent of the male graduates.

Of the total number responding, 66.7 percent lived in Louisiana, 33.2 percent resided in other states of the nation and 0.1 percent resided in a foreign country.

Thirty-four percent of the graduates responding reported having earned advanced degrees. There were 44 full-time farmers and 222 operators of farm land. Over 50 percent of the graduates were public employees, 31.7 percent were privately employed, and 13.1 percent were self-employed. Only 18.4 percent were employed in occupations not related to their major field of undergraduate study.

Male graduates earned a median annual salary of \$7,822 as compared to a median salary of \$4,538 for female graduates. Highest income was received by graduates of agricultural economics, agronomy, general agriculture, and horticulture curriculums; graduates in home economics, poultry, and forestry earned the least income.

Median earnings of graduates who were self-employed were \$1,322 more than those in private employment and \$1,853 more than those in public employment. Graduates residing in Louisiana reported higher median salaries than graduates residing in other States or in foreign countries. Farm reared alumni earned larger median salaries than graduates who were rural nonfarm or city reared. Alumni who had earned advanced degrees in medicine, dentistry, or veterinary medicine reported the highest median salaries; graduates with Master of Education or theological degrees earned the smallest annual incomes.

3189. McEWEN, GARY NEALE. Relationship Between Training in Vocational Agriculture and Occupational Selection. Thesis, M.S., 1962, The University of Idaho. 39 p. Library, The University of Idaho, Moscow.

*Purpose.*—To determine what percentage of the former senior students, in 23 selected vo-

ational agriculture departments in Idaho, were engaged in farming or in a related field.

**Method.**—A questionnaire was devised by the author and mailed to the instructors of the 23 selected vocational agriculture departments. Each questionnaire consisted of an introductory letter, questions concerning the student's present occupation, high school activities, supervised farming program, attendance at college, military service, and the influence of the high school vocational agriculture program on the student's present occupation. A total of 95.6 percent of the questionnaires was returned.

**Findings.**—The present occupations of the former students surveyed were: Farming, 63, or 33.2 percent; agriculture-related, 20, or 9.7 percent; nonagricultural, 81, or 39.5 percent; college students, 36, or 17.6 percent.

The largest percentage, 54.4 percent, of the students who were farming had formed a partnership with a relative. Only one former student had formed a partnership with a non-relative. It was found that 10 students were owner-operators of their farms and 16 were part-time farmers.

The former students' high school supervised program was rated by the instructors. It was found that 45.6 percent of the students engaged in farming were rated excellent on their supervised farming program. Only 23.9 percent of the students in a nonagricultural occupation received a rating of excellent on their supervised farming program.

One hundred students had attended college or were attending at the time the questionnaires were completed. Of these, 45 percent were studying some phase of agriculture.

Seventy-two percent of the students who were farming were influenced by the high school vocational agriculture program. Fifty-five percent of the students in an agriculture-related field were influenced by the high school vocational agriculture program, and 23.4 percent of the students in a nonagricultural field were influenced by the high school vocational agriculture program.

From the results of the survey it appeared that the Idaho vocational agriculture program was adequate. Vocational agriculture instructors encouraged the students in their departments to maintain a good quality of supervised farming program.

**3190. MCKILL, ARLEN DWIGHT.** The Mental Ability and Scholastic Achievement of Freshman Vocational Agriculture Students in Shelby County, Ohio. Thesis, M.A., 1961, The Ohio State University. 63 p. Library, The Ohio State University, Columbus.

**Purpose.**—To determine the mental ability and scholastic achievement of freshman vocational agriculture students, and to compare

these measurements with the norm for all students.

**Method.**—IQ scores from the California Test of Mental Maturity and grade point averages were obtained from the permanent records of 186 vocational agriculture freshmen in 6 Shelby County, Ohio, schools. This represented all freshman agriculture students from 1957 through 1960. Additional IQ scores were secured for 268 Shelby County freshmen from composite score sheets in the County Superintendent's office. These were all freshmen enrolled in Shelby County in 1960. The data were then tabulated with the assistance of the Division of Guidance and Testing, Ohio State Department of Education.

**Findings.**—The IQ distribution of the vocational agriculture students was found to be similar to the normal distribution of this age group. No significant difference in IQ by year was found in the years included in the study.

Academic grade point average was found to be very similar to the normal distribution; however, agriculture grade point averages were statistically higher than academic averages. There was apparent correlation of academic grade point average with IQ, but no correlation of agriculture grade point average with IQ.

**3191. MADISON, ELDON H.** The Effectiveness of Visual Aids in Presenting an Analysis of Selected Farm Management Factors. Dissertation, Ph. D., 1962, University of Minnesota. 82 p. Library, University of Minnesota, Minneapolis.

**Purpose.**—To determine which of two ways is better for visual teaching of certain farm management information to high school agriculture students.

**Method.**—Identical experimental trials were conducted in three schools, using students who had studied the recordkeeping and analysis phases of farm management. Students in each school were randomly divided into two equal-size groups. One section was presented a summary of farm management information, using tables of numbers. The other section was given the same summary information, using bar graphs. Both tables and graphs were prepared as overhead projector slides. A written test constructed by the writer was used as a pretest and again as a posttest. A reliability coefficient of 0.88 for the test instrument was obtained, using Hoyt's analysis of variance technique.

The mean scores of Sections I and II for each school were compared, using a t-test. Next the mean gain in score from pretest to posttest was tested with a t-test. Following this step an analysis of variance was run, using unweighted means to test the hypothesis that there was no difference in means between schools, between treatments, or due to inter-

action. The final statistical test was an analysis of covariance to partial out the effects of the pretest.

*Findings.*—A comparison of the differences in scores of the pretest and posttest showed that learning had taken place in all six groups. The analysis of variance showed that there was a significant difference in means between schools on both the pretest and the posttest. There was no difference between treatments or due to interaction. When an analysis of covariance was applied holding the effects of pretest constant, the difference between schools was removed. It was concluded statistically (1) that the tables of numbers did not contribute more to the achievement of students, nor did they contribute less to the learning; and (2) achievements in all three schools were comparable when effects of the pretest were held constant.

3192. MAGISOS, JOEL HANS. Identification of Some Factors Influencing First Enrollment of Students in Vocational Agriculture in Northeast Washington. Thesis, M.S., 1962, Washington State University. 41 p. Library, Washington State University, Pullman.

*Purpose.*—The slowing enrollment trends in vocational agriculture in the State of Washington prompted a study of the factors influencing first enrollment by students. The purpose of the study was to determine: (1) When does a student first become aware of the program and when does he first decide to enroll? (2) Who influences the student's decision to enroll? (3) What is included in vocational agriculture that attracts a student prior to his enrollment? (4) To what extent does the school counseling service influence a student's choice of vocational agriculture?

*Method.*—A questionnaire was used to survey 215 first-year students of vocational agriculture in 15 schools in northeast Washington State, representing 90 percent of all first-year students enrolled in the area. A separate questionnaire completed by the 15 agriculture instructors provided certain basic information about the schools and communities.

*Findings.*—The study concluded that there were differences between the students required to take the course and those having an elective choice. Generally, the students became aware of the program early, but made the decision to enroll shortly before the decision was necessary. The vocational agriculture facilities attracted the students most, while the study of livestock and shop practices ranked as the most interesting features. The family, the agriculture instructor, and older boys enrolled in vocational agriculture exerted the most personal influence on the decision to enroll, while fairs and shows ranked first in events influencing that decision. School counseling services exerted a minor influence.

3193. MALONE, KENNETH M. Pre-Service Training Needs in Agricultural Mechanics for Prospective Vocational Agriculture Teachers. Thesis, M.S., 1961, West Virginia University. 85 p. Library, West Virginia University, Morgantown.

*Purpose.*—To determine preservice training needs in the several areas of agricultural mechanics for prospective vocational agriculture teachers, and the relative importance of understandings and abilities in the instructional program in vocational agriculture.

*Method.*—The study was based on survey returns from 69 vocational agriculture teachers in West Virginia. The survey forms embraced instructional areas of agricultural mechanics developed by a State committee of vocational agriculture teachers. The forms were sent to teachers in West Virginia to get their opinions as to the emphasis that should be placed on the various areas of instruction and how valuable the training would be in present and future teaching.

*Findings.*—In the area of instruction pertaining to drawing and sketching, the prospective teacher should be provided with training which will develop his own mastery of the skills involved. Carpentry and woodwork were found to include areas of instruction for which training would be indispensable, or very valuable, namely: Measuring, marketing, and laying out lumber; fastening wood with nails, screws, and glues; and identifying and using stationary tools properly. Eighty percent of those surveyed were of this opinion. More than 60 percent of the teachers surveyed believe that the prospective teacher should develop the ability to cut common rafters; mix, pour, and finish concrete; and estimate the amount of lumber needed.

In areas of electric welding, 69 percent believed the prospective teacher should develop the ability to weld. In both electric welding and oxyacetylene welding, training in safety measures was named indispensable. In areas of cold metalwork, instruction in how to cut, file, drill, bend, rivet, grind, and thread would be very valuable in the instructional program. Less training was believed needed for cutting gaskets, and more for measuring and preparing pipe.

According to a large percentage of those surveyed, the areas of soil and water management, wind systems and air movements, precipitation (forms and types of rainfall), and transportation of water would be of little value in the instructional program. Training pertaining to farm power and machinery that would be indispensable for present and future teaching would include an understanding of the lubrication, electrical, and fuel systems, and of the functions of the wearing surfaces of machinery.

Farm electrification was found to include areas of instruction which would be indispensable, or very valuable, such as care and maintenance of electric motors and selection of types and sizes of electric motors.

3194. MARTIN, JAMES L. The Realization of Plans by Male Youth in Five Representative Counties as Measured by a Comparison of Residential, Occupational, and Educational Classification. Thesis, M.S., 1963, University of Wisconsin. 86 p. Department of Agricultural and Extension Education, University of Wisconsin, Madison.

*Purpose.*—The objectives of the study were: (1) To determine the migration of youth from the home community according to residential and occupational classification; (2) to determine the degree to which plans can be achieved realistically by comparing aspirations of youth in each occupational status with the opportunities in that type of occupation; (3) to determine the degree to which each occupational group is presently pursuing an educational program in accordance with their occupational plans; and (4) to determine the stability of youth's occupational plans based on 1958 sophomore aspirations, 1962 present occupations, and desires 10 years hence in 1972.

*Method.*—This study was a part of Wisconsin Agricultural Experiment Station Project 985, and as such was a part of a longitudinal study which was started in 1957. The original population was selected from the high school freshman students in the 1957-58 school year. It was composed of the entire freshman population of five representative, nonmetropolitan, Wisconsin counties. In January of 1957, a questionnaire was administered to each participant to obtain background information. The original sample consisted of 1,107 freshmen in the high schools within the areas selected.

In the succeeding years, followup questionnaires were sent to these individuals to obtain additional educational and occupational information. In 1962, 1,047 of the original 1,107 individuals constituted the sample which was used for this study.

*Findings.*—It was found that 7.3 percent of the youth listed the same occupational choice as sophomores in 1962 as they had in 1958. Migration did not appear to be as dependent on residential classification in this study as it was on economic areas of the State. It was found that 45 percent of the rural farm youth, 51.5 percent of the rural nonfarm youth, and 49.6 percent of the urban youth in this study actually had migrated from the home community during the 1957-1962 period. It was found on the followup questionnaire that 288 youth aspired to be professional

workers by 1972 as compared to 183 who had indicated that they would like to be professional workers at the time the original questionnaire was administered to them as sophomores. Approximately two-thirds of the 1962 group were pursuing further education and could be expected to achieve their occupational goals.

3195. MARVIN, R. PAUL. The Development and Experimental Trial of a Unit Operation Method of Instruction in Mechanized Agriculture. Dissertation, Ph. D., 1961, University of Minnesota. 101 p. Library, University of Minnesota, Minneapolis.

*Purpose.*—To develop course content and methods of procedure for teaching farm machinery by the unit operation concept, and to evaluate the practical application of the method in an experimental trial.

*Method.*—A study of farm machinery in use today proved that nearly every operation found in farm machines could be classified as one of the following unit operations: Conveying, shearing, sorting, size reduction, positioning, preparing, packing, mixing, and metering.

Modern farm machines combine a large number of individual processes, but these may be broken down into a series of steps called operations, each of which appears in machine after machine. The operations have common characteristics and are based on the same scientific principles.

Another phase of the investigation was to evaluate the two methods of teaching in terms of presently accepted objectives. Questions were taken from existing examinations. The reliability of the test was 0.74 as determined by the Spearman-Brown formula.

The test was administered as a pretest to an entire class of 37 students in the School of Agriculture at the University of Minnesota. The class was then divided randomly for 11 weeks of instruction. The pretest was used as a posttest and the resulting scores of two groups were analyzed.

*Findings.*—The outcome of one comparison trial of teaching farm machinery by unit operations, as opposed to the conventional method, indicated that presently accepted objectives could be achieved as well by teaching operational units as by teaching according to the individual machine method.

The experimental group did not show an advantage in respect to mean of the gains on the scores of the test. Variance of the difference from pretest to posttest scores proved to be significant in the experimental group but not for the control group, which implies that the unit operations method more adequately provided for individual differences within the group.

The unit operations method focused attention on individual considerations by eliminating the distracting influences of external appearances. Simple models, drawings, and filmstrips were employed to a greater extent in the experimental group than was possible with the control group. It also provided a method of considering principles which applied to operation and maintenance of component machines without regard to differences of makes and models.

**3196. MASSEY, CLAYTON ALBERT.** A Study Concerned with the Teaching of Range Management in High School Vocational Agriculture Departments on the Edwards Plateau of Texas with Recommended Teaching Plans. Thesis, M.A., 1962, Southwest Texas State College. 64 p. Library, Southwest Texas State College, San Marcos.

*Purpose.*—To determine the problems confronting vocational agriculture teachers in teaching range management in the public schools on the Edwards Plateau of Texas.

*Method.*—A questionnaire was sent to 94 instructors employed in accredited departments of vocational agriculture in Texas during the summer of 1962. Seventy-five questionnaires were returned, representing 79.8 percent of the inquiries mailed. The information thus secured was tabulated and analyzed to provide the data interpreted in the study.

*Findings.*—A summary of the data revealed that a portion of each range management problem was taught in each of the high school classes. In Agriculture I classes, 61 percent of the vocational agriculture teachers reported they were teaching identification and evaluation of range plants, preferring to teach this subject in the fall of the year. Fifty-one percent of the teachers indicated that recognizing the economic importance of range management should also be taught during the first year.

Sixty-seven percent of the teachers reported they were teaching supplemental feeding on the range in Agriculture II classes. This subject was taught in the winter by the majority of the teachers. Controlling undesirable range plants was taught by 45 percent of the teachers in the second year. Fifty-two percent of the teachers indicated that erosion control on range lands should be taught in Agriculture III classes. The season preferred for teaching this subject was either fall or spring. Grazing systems and stocking rates were also of importance during the third year.

It was the opinion of 70 percent of the vocational agriculture teachers that a teacher should have completed 6 or more college hours in range management to teach this subject satisfactorily in the public schools of the Edwards Plateau. The majority of the teachers were of the opinion that more range man-

agement should be taught in their departments. Eighty-three percent of the vocational agriculture teachers indicated they were using the Soil Conservation Service for resource information.

Ninety percent of the vocational agriculture instructors requested teaching plans to aid them in the teaching of range management problems. Teaching plans, based on the analysis of this survey, were prepared for the instructors.

**3197. MILLER, FRANCIS LAMBERT.** Farming Programs for High School Vocational Agriculture Students with Limited Farming Opportunities. Thesis, M. Sc., 1961, The Ohio State University. 139 p. Library, The Ohio State University, Columbus.

*Purpose.*—To determine desirable procedures used by experienced vocational agriculture teachers for guiding students with limited home farm opportunities to develop farming programs with cooperating farmers.

*Method.*—Questionnaires and personal interviews were employed. Seventy teachers were asked to supply information concerning farm placement and farming programs of students. The teachers also conducted interviews with cooperating farmers. Replies were received from 53 teachers.

*Findings.*—Thirty-three of 50 students surveyed were from urban or rural residences; the remainder were from part-time farms. The majority of cooperating farmers indicated students would have "good" opportunities for supervised farming programs and for certain types of farming arrangements after graduation. They indicated satisfaction with the students in terms of cooperative attitude, willingness to learn, and personality. The majority indicated they were happy to help students meet project requirements, gain experience, and develop partnerships.

Teachers rated students on farm placement above average in initiative, cooperative attitude, and personality. Cooperating farmers were rated "above average" in leadership, integrity, and interest in students.

Problems mentioned by teachers included working agreements, recordkeeping, lack of parent cooperation, and inability to expand farming programs. Procedures helpful to teachers included discussions and visits with students, parents, and cooperating farmers; careful selection of students and cooperating farmers; classroom discussions; and adequate guidance and counseling of students.

**3198. MOORE, JOSEPH H.** The Development and Educational Application of Relationships for Use in Estimating the Nutritive Content of Forages. Thesis, M. Ed., 1963, The Pennsylvania State Uni-

versity. 62 p. Library, The Pennsylvania State University, University Park.

*Purpose.*—(1) To evaluate the method used by the Penn State Forage Testing Service for estimating the total digestible nutrients of forage crops; (2) to determine relationships of crude protein, crude fiber, and lignin by forage groups to digestion trial TDN; (3) to develop improved equations for estimation of nutrient content of forages; and (4) to appraise the educational values of the forage testing program.

*Method.*—Data from 648 forage digestion trials reported in journals were classified. Forages used in the trials were grouped as follows: All species and all cuttings; grasses, all cuttings; legumes, all cuttings; mixed, mainly legumes; mixed, mainly grasses; annuals; first cuttings, all species excluding annuals; aftermath cuttings, all species excluding annuals; all species, all cuttings in three protein levels—above 17 percent, 10 to 16 percent, and below 10 percent. Crude protein and fiber were reported for the 648 samples. Lignin content was known for 221 samples.

The Axelsson-Reid-Swift formula currently used at Penn State for computing TDN from crude protein and crude fiber was used on the samples, by forage groups, and the result correlated with the reported digestion trial data. New regression equations were developed on the data in the 648 samples, and the 221 samples. Correlations with digestion trial TDN were computed. Educational considerations guided recommendations made concerning formulas and forage groupings.

*Findings.*—The single formula for all forages in use in the Penn State Forage Testing Service produced TDN predictions that correlated significantly at the .01 level with digestion trial TDN values. The correlation was .752 for legumes, all cuttings. It was .427 for grasses, all cuttings, and .518 for all species, all cuttings. New formulas computed by forage groups from the data correlated, respectively, .753, .604 and .530. The present Penn State formula somewhat overestimates the TDN of legumes. Also, it correlates best on high protein samples. The new separate TDN equations are:

For legumes  $Y = 74.43 + 0.35$  crude protein  $- 0.73$  crude fiber

For grasses  $Y = 50.41 + 1.04$  crude protein  $- 0.07$  crude fiber

Predictions from an equation using crude protein and lignin content of 221 samples of all species and cuttings combined correlated .762 with digestion TDN. This is so much higher that consideration should be given to the feasibility of substituting the lignin test for the crude fiber test.

As an educational aid, forage testing stimulates interest in forage quality, both in how to produce better forage and in how to plan feeding programs to take maximum advantage of available supplies.

3199. MUGLER, DAVID J. A Pilot Study of Dane County, Wisconsin, Vocational Agriculture Graduates Engaged in Agribusiness. Thesis, M.S., 1962, University of Wisconsin. 51 p. Department of Agricultural and Extension Education, University of Wisconsin, Madison.

*Purpose.*—To learn how former vocational agriculture students, who were employed in agribusiness, felt the training they received in the high school agriculture program prepared them for the businesses in which they were engaged.

*Method.*—Data were secured by questionnaires from 50 selected graduates of 10 vocational agriculture departments within Dane County, Wisconsin, who were presently engaged in an agribusiness.

*Findings.*—Forty-nine of the 50 persons indicated that they had a farm background. The graduates felt that the greatest contribution that the high school agriculture program made was in helping them perform mechanical jobs. Fifty-six percent indicated that their vocational agriculture training had helped them greatly in this area of their work. Fifty-six percent recommended that vocational agriculture instructors give greater emphasis to the farm mechanics program.

When asked if a college education would help them in their present vocation, 18 of the graduates answered "yes," 18 answered "no," and the others were "undecided."

Thirty-eight percent of the graduates indicated that the most important reason for not going into active farming was that they had no available opportunity to become actively engaged in farming.

The phase of the vocational agriculture program receiving the greatest overall credit in contributing to success in the work of the graduates contacted was agriculture classroom activities, followed in order by Future Farmer activities, public speaking and parliamentary procedure, supervised farming programs, farm operation skills, farm mechanics skills, and judging contests.

Ninety-six percent recommended that a high school student enroll in vocational agriculture if he were planning to go into active farming, 82 percent recommended it if one were to go into a farm-related business or industry, and 24 percent felt it would be worthwhile for a student to take vocational agriculture while in high school if he were to become engaged in an occupation unrelated to agriculture.

3200. NOEL, WRIGHT R. Placement of Vocational Agriculture Students. Thesis, M.S., 1962, Oregon State University. 67 p. Library, Oregon State University, Corvallis.

*Purpose.*—To investigate, isolate, and report fundamental principles for the establish-

ment and operation of a placement program.

*Method.*—A survey was made of the vocational agriculture departments in the State of Oregon to determine how many had placement programs. Five departments in the Willamette Valley were visited and the instructors interviewed with the use of an interview checklist. Correspondence was conducted with men working in this area. A search of related literature was made. The information gathered from these sources was then compiled to formulate the basic principles.

*Findings.*—The principles reported were divided into two areas: Principles of policy, and principles of operation.

The principles of policy were: (1) The placement program should serve as an articulator between instruction and industry; (2) a thorough knowledge of the community is basic to a good placement program; (3) a well conducted program will greatly benefit the boy placed, the agriculture department, and the community; (4) simplicity should be a key-word in organizing a placement program; (5) occupational information must be an integral part of a placement program; and (6) the agriculture instructor should coordinate his efforts with the high school counselor.

The principles of organization were: (1) Concrete objectives should be set before starting a program; (2) a good placement program is dependent upon adequate employers; (3) the program should be started on a limited scale and then developed as the demand increases; (4) the boy should be placed on a job that fits his personal interests, abilities, and needs; (5) careful selection should be used in choosing placement positions for boys; (6) an understanding of their respective roles in the placement picture by the boy, his parents, and the employer is essential for a smoothly functioning program; (7) followup is an integral part of placement; and (8) continuous evaluation involving the student, the employer, and the instructor is essential.

3201. O'KELLEY, GEORGE L., Jr. and LESTER, H. T., Jr. A Comparison of the College Performance of Students Who Did and Those Who Did Not Study Vocational Agriculture in Georgia High Schools in Terms of Grades Earned During the Freshman Year of Study at the University of Georgia During the 1960-61 School Year. Staff Study, 1963, University of Georgia. 36 p. Research Series, Bulletin No. 1, Department of Agricultural Education, University of Georgia, Athens.

*Purpose.*—To compare the college freshman year performance of students who did and those who did not study vocational agriculture in Georgia high schools, and to determine

whether college performance differed by units of high school agriculture.

*Method.*—The study population consisted of all male members of the University of Georgia freshman class of 1960-61 who completed three quarters of study during the school year and who were graduates of Georgia high schools. Study groups were classified as to number of vocational agriculture units of credit submitted for University admission. Earned grades were determined for specific courses and mean grades calculated. Differences between study groups were determined. Distribution of letter grades on specific courses were determined and chi-square values calculated to test significance of difference between study groups. To compare years of high school vocational agriculture, t-values were calculated. College Entrance Examination Board scores were determined and group means calculated with significance of difference tested by t-values.

*Findings.*—(1) There was no statistically significant difference between mean freshman grades earned by the two study groups. (2) The nonvocational agriculture group had significantly higher (.01 level of confidence) mean CEEB verbal and mathematics scores than did the vocational agriculture group. (3) No statistically significant differences were found between the two study groups in terms of grades earned in any of the specific University courses investigated, including botany, chemistry, economics, English, mathematics, political science, physics, and zoology. (4) There was no statistically significant difference between the two groups for students registered in the College of Agriculture in terms of mean college grades earned.

3202. OMAR, AHMED M. Working Relationships of County Extension Agents and Teachers of Vocational Agriculture in Michigan. Dissertation, Ph. D., 1963, Michigan State University. 264 p. Library, Michigan State University, East Lansing.

*Purpose.*—To investigate activities and factors in working relationships of county extension agents and teachers of vocational agriculture and to determine differences in opinions regarding these working relationships.

*Method.*—A mail survey checklist was used to collect data from county extension agents and teachers of vocational agriculture in the 61 counties in Michigan where both teachers and agents were employed. Returns were received from 122 of the 129 agents and 180 of the 204 teachers contacted. Responses were recorded on IBM cards and chi-square values completed to determine association of background characteristics with responses of the two professional groups.

*Findings.*—The study indicated that opinions of the teachers and the agents did not

differ significantly with regard to the desirability of carrying out 28 activities, but did differ with respect to working out a program of cooperation between 4-H and FFA, and arranging for educational meetings for farmers.

Opinions differed significantly with regard to the following working relationship factors: The other's personality; degrees of academic education; similarity of educational specialization; similarity and difference of inservice training in technical subject matter; similarity of inservice training in teaching methods; the other's experience in working with rural people; the other's experience in the field of agriculture; one's experience in the field of agriculture; and relationships between school administrators and county extension staff. Responses of the agents and the teachers tended to indicate positive or neutral effects.

No relationship was found between three background characteristics of the teachers and their opinions with regard to the effect of the intraorganizational factors. Among the agents there was a significant positive relationship between age and opinions regarding the effect of clarity of functions as specified by the Smith-Lever and the Smith-Hughes Acts. Agents with higher college degrees viewed the difficulty of scheduling factor as having a negative effect on educational programs in agriculture.

Twenty implications were drawn from the findings, all of which encourage and support close working relationships between the two professional groups.

3203. OMWEG, JAMES ERNEST. A Study of Facilities and Time Used in Teaching Mechanics by Teachers of Vocational Agriculture in Ohio. Thesis, M.A., 1963, The Ohio State University. 100 p. Library, The Ohio State University, Columbus.

*Purpose.*—To determine the farm mechanics skills being taught by teachers of vocational agriculture in Ohio and the practices that would be followed in teaching these skills if shop facilities were not available.

*Method.*—A questionnaire was designed to determine farm mechanics skills being taught and the usual facility used in teaching farm mechanics skills. The teachers also designated an alternate teaching procedure that would be followed if shop facilities were not available.

The areas of farm mechanics covered were welding, mowers, tractors, corn planters, corn pickers, combines, soldering, painting, plumbing, balers, weed and insect sprayers, soil and water management, general, metalwork, tool fitting, forage harvesters, grain drills, electricity, woodworking, tractor plows, and concrete.

*Findings.*—No specific farm mechanics skills were taught exclusively in the classroom. Farm mechanics areas such as woodworking,

tool fitting, welding, painting, soldering, metalwork and plumbing were usually taught in the school farm shop. Most farm machinery skills can be taught in the classroom and/or on field trips. Consequently, shop space does not appear to be absolutely necessary to teach all areas of farm mechanics. Vocational agriculture teachers used an average of 38 percent of total instructional time to teach farm mechanics.

3204. OREN, JOHN WILLIAM, JR. The Development of a Horticultural Program in Vocational Agriculture. Thesis, M.Sc., 1963, The Ohio State University. 99 p. Library, The Ohio State University, Columbus.

*Purpose.*—To secure information and techniques which would be helpful to any teacher of vocational agriculture who is interested in the development of horticultural work-experience programs.

Other objectives were: (1) To develop a course of study in horticulture for vocational agriculture; (2) to identify possibilities for providing effective horticultural work experience; and (3) to discover and develop information and techniques essential for the effective supervision and evaluation of a horticultural work-experience program.

*Method.*—This was an "action" research study. The information was collected through personal conferences and interviews with people representing the various phases of the horticultural work-experience program. These people included the State supervisor and district supervisor of vocational agriculture, 25 students and their parents, 5 county and local school administrators in Ashtabula County, 5 local school board members, 15 teachers of vocational agriculture, and 12 of northeastern Ohio's prominent men in the field of horticulture.

*Findings.*—This study brought about the development of a course of study for horticultural training. Also evolving from the study was the development of a horticultural work-experience program. In this phase of the study the following areas were emphasized: The selection of cooperating employers; the selection of students for horticultural work-experience programs; the planning of experiences for a horticultural work-experience program; a plan of experiences and a record book for students in a horticultural work-experience program; and techniques for the supervision and evaluation of a horticultural education program.

3205. OSSWALD, RICHARD EUGENE. The Agricultural Environment of Students in Vocational Agriculture in Ohio. Thesis, M.A., 1962, The Ohio State University. 125 p. Library, The Ohio State University, Columbus.

*Purpose.*—To secure helpful information concerning students of vocational agriculture in Ohio, and their home background.

*Method.*—A survey, in the form of a questionnaire, was made of all vocational agriculture students in 32 schools from each of the 15 supervisory districts in the State. A total of 966 students participated.

*Findings.*—One-third of the students came from farms where the fathers were employed full time in farming and 35 percent were from farm homes where the fathers received less than one-half of their income from farming. The fathers of the remaining one-third of the students were urban residents with little or no income from farming.

There were fewer fathers of students who were full-time farmers in 1962 than in 1950. The number had decreased at a rate of 1 percent each year. The urban resident (no farm income) group was another category in which much change was noted. The increase from 1950 to 1962 was nearly 6 percentage points.

More than one-third of the students were from farms where the parents owned less than 100 acres. Parents who were strictly farm renters usually farmed more than 100 acres. One-seventh of the parents either owned or rented farms of 1 to 9 acres. Nine percent of the total number of students' parents had no farming acreage.

Fifty-one percent of the students presently enrolled in vocational agriculture plan to pursue farming as a vocation. Seventy-two percent of the students had a vocational objective in the field of agriculture, though not necessarily farming. Farming as a future occupation was selected less frequently as students progressed through school.

Eight out of 10 students in vocational agriculture planned to take 4 years of instruction. Farm experience was found to be the greatest single factor influencing students to enroll in vocational agriculture.

3206. PARROTT, ELLWOOD SAGER. An Analysis of a Forced-Choice Performance Appraisal System for Agricultural Education Trainees in Ohio. Thesis, M. Sc., 1962, The Ohio State University. 54 p. Library, The Ohio State University, Columbus.

*Purpose.*—To validate the forced-choice performance appraisal system as an objective method of evaluating performance of apprentice trainees. Two specific objectives were identified. The first of these was to validate the forced-choice performance appraisal system as a procedure for measuring the performance of apprentice trainees. The second was to identify the reaction of cooperating teachers and agents regarding the procedures involved in the forced-choice system as well as those presently used in evaluating trainees.

*Method.*—Certain portions of the instrument currently used by the Ohio Extension Service were selected for use in this study. This selection was made by a panel of Extension Service supervisors, apprentice trainee supervisors, and cooperating teachers and agents. Twenty-one trainees were involved in the study. These included all the students enrolled in the apprentice program during the autumn quarter of 1961 and the spring quarter of 1962. The major validating criteria were paired comparison ratings on all the students as determined by a panel of three apprentice trainee supervisors. In order to learn the reaction of cooperating instructors to both present methods of evaluation and the forced-choice instrument, a questionnaire was mailed to all instructors.

*Findings.*—Of central importance was the high positive correlation (.53) that was found between the composite forced-choice results and the composite paired comparison. The study also revealed an insignificant difference of opinion between the thinking of cooperating teachers and agents. Another finding of major importance was the indication of only mediocre satisfaction among the cooperating teachers and agents with both the present method of trainee performance evaluation and the forced-choice system. On a 10-point intensity rating scale, the present system received only an average rating of 6.5, while the forced-choice system averaged 6.9.

3207. RICHARDSON, BURL BURTON. Determining the Training Needed for Selected Farm Related Occupations in Four Counties in Oklahoma. Thesis, M.S., 1962, Oklahoma State University. 48 p. Library, Oklahoma State University, Stillwater.

*Purpose.*—To determine the types of training that would be beneficial for selected agriculture-related occupations, and the prospects for increased employment in these occupations in the future.

*Method.*—Personal interviews were conducted with persons in five farm-related occupations—farm machinery, dairy processing, buildings and structures, nursery production, and feed, seed, and fertilizer. The average rating by owner-managers of the 63 farm-related businesses concerning different areas of training was used as an indicator of the relative importance of a particular area of training.

*Findings.*—All farm-related businesses showed an expected increase in employment, with nursery production indicating the largest increase of 60 percent. Vocational agriculture was found to be important training and a farm background was of some value. Training in agronomy, farm mechanics, and farm business seemed to be important to farm machinery, nursery production, and to the feed,

seed, and fertilizer business, but of only "some" value to workers in buildings and structures. The feed, seed, and fertilizer, and farm machinery businessmen said that some training in livestock and poultry was needed. Most of the businessmen felt that FFA activities were of some benefit. English and basic arithmetic were highly important to all related occupations concerned. Salesmanship was rated highly important by those in most of the related occupations. Training in science was of some importance. Industrial arts was said to be highly beneficial in building occupations. Nurserymen felt additional training in horticulture was needed for working in that occupation.

It appeared that teachers of vocational agriculture need to become more aware of the importance of present training in vocational agriculture for related occupations, and of how they could better utilize training opportunities and possibilities for these occupations as well as for proficiency in farming.

3208. RUFF, ELDON EUGENE. *An Analysis of the Occupational Adjustment Problems of Young Adults in St. Joseph County, Indiana*. Dissertation, Ph. D., 1962, Purdue University. 134 p. Library, Purdue University, Lafayette.

*Purpose.*—The study was designed to: (1) identify and analyze the problems of occupational adjustment which members of the young adult population were experiencing at the time of the study; (2) develop a technique of inventory construction which would incorporate into the occupational adjustment score for each young adult both a seriousness and an intensity dimension; and (3) identify factors significantly related to occupational adjustment.

*Method.*—An Occupational Adjustment Inventory for Young Adults, consisting of 108 problem items and a list of selected factors to be tested, was administered to 49 young men and 49 young women living in St. Joseph County, Indiana. From each young adult a measure of intensity was obtained for each problem. A measure of seriousness was obtained for each problem by administering the Specialist's Seriousness Rating Form to a national random sample of 40 industrial psychologists and 40 vocational guidance specialists. Subsequently, seriousness and intensity scores were combined to give a quantitative description of each young adult for occupational adjustment.

Reliability and validity checks made on the inventory indicated an instrument with high internal consistency reliability coefficients (.85 to .98) and with adequate indications of content, intrinsic, and concurrent validity.

The primary factors of age and location of high school were analyzed by 7 by 2 factorial experiment to test the main effects of age

(7 levels, 18 to 24), and the interaction of age by location of high school. Data for the 17 secondary factors of interest were analyzed, using a completely randomized design.

*Findings.*—The administration of the Occupational Adjustment Inventory for Young Adults and the Specialist's Seriousness Rating Form revealed that a single adjustment problems inventory for both men and women was not satisfactory; that young adults were independent in their ratings of intensity and seriousness; and that young adults and specialists viewed differently the seriousness of certain occupational adjustment problems.

Analysis of the primary factors, age and location of high school, revealed no significant effects on the occupational adjustment scores of young adults.

Seventeen secondary factors were analyzed in the exploratory phase of the study. Three factors—high school course of study, church attendance, and socioeconomic status—had significant effects on the occupational adjustment scores of young men; three factors—marital status, children, and number of previous jobs—had significant effects for women; one factor—level of schooling—had significant effects on the occupational adjustment scores of both men and women.

3209. RUTH, DENVER JAMES. *Future Farmers of America Incentives*. Thesis, M.S., 1962, University of Tennessee. 89 p. Library, Department of Agricultural Education, University of Tennessee, Knoxville.

*Purpose.*—This study sought to determine the ways in which contests and awards influenced Future Farmers of America members, teachers, and others; and the extent to which Future Farmers of America members, advisers, and others were influenced by contests and awards.

*Method.*—Data were secured from 57 teachers of vocational agriculture in the east Tennessee Future Farmers of America district. The 21 contests and awards included in this study were: Public Speaking Contest; Parliamentary Procedure Contest; Creed Contest; Star Farmer Award; State Farmer Degree Award; Star Greenhand Award; Dairy Farming Award; Livestock Farming Award; Poultry Production Award; Farm Mechanics Award; Farm Electrification Award; Soils and Water Management Award; Farm Safety Award; Dairy Judging Contest; Livestock Judging Contest; Soil Judging Contest; Fat Calf Show and Sale; Livestock Fairs; Crop Fairs; Farm Mechanics Skills Contest; and Sweetheart Contest.

*Findings.*—The study indicated that there were differences of opinion among teachers of vocational agriculture regarding the educational value of Future Farmers of America contests and awards.

The contests which had the greatest educational value for students as observed by vocational agriculture teachers were the Soil Judging Contest, Livestock Judging Contest, State Farmer Degree Award, Parliamentary Procedure Contest, Public Speaking Contest, and Crop Fairs.

Lowest ratings were given to the Poultry Production Award, Fat Calf Show and Sale, Star Farmer Award, Star Greenhand Award, and the Sweetheart Contest.

More than 50 percent of the teachers stated that the contests having the most educational value for students made teaching more stimulating, helped teachers do a better job in these areas, and helped the Future Farmers of America get favorable publicity. From 25 to 32 percent of the teachers felt those contests and awards contributed to their spending too much class time in these areas.

Indications were that most of the worthwhile learning connected with contest and award programs took place at the local level, and that the primary concern should be with high-quality teaching of all students and not with the development of excellence in a few students.

Teachers stated that contests and awards programs were one of many teaching devices available to them. They believed that winning contests should not become an educational goal for themselves, for their students, or for the public, and that teachers and members should not try to justify a contest solely on the basis of entertainment or public relations value.

3210. SAHLSTROM, STANLEY DAVID. Factors Influencing College Attendance Plans of Capable Rural High School Seniors. Dissertation, Ph. D., 1961, University of Minnesota. 153 p. Library, University of Minnesota, Minneapolis.

*Purpose.*—To identify factors affecting capable rural high school seniors in their decision to attend college, and to establish the relative importance of these factors in seniors' plans for attending or not attending college.

*Method.*—The writer visited 26 high schools of Central Minnesota and submitted survey forms to individuals in the upper half of each senior class. Personal interviews were conducted with the same individuals. The questionnaire listed factors that supposedly affect students' choices as to higher education. Principals furnished the high school rank of each individual. In the personal interview other factors were discussed with the seniors. Factors measured were: Distance from college; home background; high school rank; income level of the family; advice of high school counselors; advice of high school instructors; education of parents; effect of working mothers; and individual expression by students as to reasons why they were or were not planning on college.

*Findings.*—From the questionnaire and individual interviews with the 718 capable seniors of central Minnesota, it was found that: Distance from college was not a significant factor; home background was an important factor; high school rank was an important factor; income level of a family did affect college attendance but was not a significant factor in itself; advice of high school counselors and instructors was a most significant factor; education of parents was an important factor; working mothers seemed to have no effect on whether the children planned to attend or not attend college.

Students named preparation for a career as the most important factor. For students who were not planning on college, lack of financial means was given as the most important factor in their decision.

As a result of the study a number of recommendations were made. These included: Enlargement of social, extracurricular, and guidance activities in the high school, stronger programs of instruction in the high schools, a statewide program of visitation to high schools for information purposes, a strong program of adult education in each school, adequate training of every teacher in counseling, finding methods of financing education, earlier identification of capable students, and conduct of further research in the area.

3211. SCHROEDER, WAYNE E. Role Expectations of State Supervision in Vocational Agriculture. Dissertation, Ph. D., 1962, The Ohio State University. 162 p. Library, The Ohio State University, Columbus.

*Purpose.*—To investigate perception of the role of State supervision in vocational agriculture as related to the operational aspects of the program at the local level.

*Method.*—A survey instrument was developed, consisting of 34 items descriptive of activities in the operation of a local program of vocational agriculture. Response categories were set up to describe and measure supervisory directiveness in relation to the activities.

The questionnaires were mailed to State supervisors, teachers of vocational agriculture, and local administrators in eight States, with 75 percent responding.

Measurements of role perception were obtained from the 34 item scores. The item scores were grouped to obtain composite scores for the four functions of administration, improvement of instruction, research and evaluation, and public relations. Differences in role expectations among groups and among States were tested by analysis of variance. Coefficients of correlation were computed to investigate the relationship between the measures of function and selected characteristics of the professional employees.

*Findings.*—Teachers, administrators, and supervisors perceived the overall role of the State supervisor of vocational agriculture at the level of directiveness indicated by the term "stimulator."

The States in which the respondents were located were related more closely to role perception of State supervision than were the respondents' positions as teachers, administrators, or supervisors.

Personal factors associated with respondents, such as years of experience or training beyond certification, and situational factors, like scope of program and experience in current position, were not found to be significantly correlated with responses regarding ideal supervisory involvement in the development of local programs of vocational agriculture.

3212. SHIH, SAMUEL H. K. A Basis for Course Content in Rural Electrification for the Preparation of Vocational Agricultural Teachers in Michigan. Dissertation, Ed. D., 1962, Michigan State University. 207 p. Library, Michigan State University, East Lansing.

*Purpose.*—To find a basis for course content in rural electrification for the preservice and inservice training of Michigan teachers of agriculture.

*Method.*—Agricultural engineers, leaders in teacher education, prospective teachers, and young farmers collaborated in preparing a checklist of 49 abilities divided into 6 subareas. The checklist was rated by seven groups—leaders in teacher education, teachers of agriculture, prospective teachers, agricultural engineers, rural servicemen, farmer members of advisory councils, and young farmers. The course content recommended for preservice training of teachers was based on a composite rating of the seven groups.

Forty-seven teachers of agriculture rated the adequacy of their own training and the frequency of teaching of the 49 abilities in their high schools. The course content recommended for inservice training was based on comparisons of the teacher rating with the composite rating.

*Findings.*—(1) According to the composite rating of the seven groups, the rank order of the six subareas was safety, wiring, motors, lighting, basic abilities, and heating and cooling. (2) The four groups related to the profession of teaching (leaders in teacher education, teachers of agriculture, prospective teachers, and agricultural engineers) rated the 49 abilities as more important than did the rural servicemen, farmer members of advisory councils, and young farmers. (3) All of the abilities in the subareas of wiring, motors, lighting, and safety were rated important enough to warrant inclusion in the course content for inservice training. (4)

The training scores were significantly lower than the importance scores, suggesting that previous training has not been adequate, and that inservice training is needed. (5) Except for a few abilities related to safety, the teachers reported that the training needed in most of the abilities is in proportion to importance. Similarly, the frequency of teaching each of the 49 abilities was directly related to the ratings of importance and the adequacy of training.

Recommendations were made for course content for both preservice and inservice training of Michigan teachers of agriculture. The findings in the present study may be used by other groups, such as instructors of short courses in rural electrification, teachers of agriculture who teach electrical abilities to high school students and farmers, rural servicemen, and rural electrification extension workers, to select teaching materials.

3213. SHONTZ, DAVID F. An Experiment in Teaching Agricultural Occupations Information to High School Students. Dissertation, D. Ed., 1963, The Pennsylvania State University. 101 p. Library, The Pennsylvania State University, University Park.

*Purpose.*—To compare the educational effectiveness of three methods of teaching agricultural occupations information associated with land use and conservation to 9th- and 10th-grade students of vocational agriculture.

*Method.*—The experiment was conducted in 24 Pennsylvania schools and involved 424 students. Eight schools were randomly assigned to each of three teaching methods. Teachers using the integrated method were furnished a teaching plan combining information on agricultural occupations and on land use and conservation to be taught in an integrated procedure, an information booklet on exploring agricultural careers, and other resource materials. Teachers who used the separate units method were furnished a teaching plan for agricultural occupations and one for land use and conservation to be taught separately, the information booklet, and resource materials. Instructors using their own customary teaching procedures were furnished a list of the titles of the problem areas in the land use and conservation unit but no resource materials.

Eighteen hours of class instruction time were utilized by each teacher in each method. Criterion measures included a test on agricultural occupations; a test on land use and conservation; a checklist of expressed interest in 20 occupations associated with land use and conservation; and the Kuder Preference Record—Occupational, Form D (for 5 occupations—forester, farmer, veterinarian, vocational agriculture teacher, and county agent). Individual differences were controlled by a

test, Reading Comprehension, Form 2A, of the Cooperative English Tests, and by pretests on each of the criterion measures. The regression of each test score on the corresponding pretest score was significant. The principle of parsimony was applied to eliminate the variables in the reverse order of their importance. Analysis of covariance and the correlated t-test were employed to test the hypotheses. The .05 level of significance was chosen. The Tukey test was used to determine the significance of differences between pairs of adjusted mean test scores for teaching methods.

*Findings.*—The integrated and separate units teaching methods did not differ significantly in student achievement on the agricultural occupations test and on the land use and conservation test; both were superior to the instructor's own method. Expressed student interests and inventoried student interests did not differ significantly among the three teaching methods. There was an increase of test scores over pretest scores for agricultural occupations and for land use and conservation for the integrated and separate units methods; for the instructor's own method there was no gain on the occupations test but there was an increase on the land use and conservation test. All methods resulted in increases in scores on expressed interests but had no generally consistent influence upon students' inventoried interests in five agricultural occupations. The organized instructional units were essential for effective teaching of agricultural occupations information related to land use and conservation.

3214. SMITH, CHARLES LEONARD. *Safety Practices of Teachers of Vocational Agriculture in Farm Mechanics Shops in Georgia.* Thesis, M.S., 1962. University of Tennessee. 52 p. Library, Department of Agricultural Education, University of Tennessee, Knoxville.

*Purpose.*—The objectives of the study were to: (1) identify the types of accidents that happened most frequently in farm mechanics shops in Georgia; (2) determine the nature and causes of accidents occurring in farm mechanics shops; and (3) determine methods, practices and devices used by teachers of vocational agriculture for conducting a farm mechanics safety program in the high school.

*Method.*—Data used in this study were secured by questionnaire from 126 teachers of vocational agriculture in Georgia.

*Findings.*—The teachers reported 153 injuries that had resulted from cuts, burns, eye damage, bruises, lacerations, abrasions, and broken bones. Most of the injuries were minor. One death was reported from the improper use of gasoline.

Carelessness, lack of concentration, disobedience, and unsafe practices in the shop

were the most frequently listed personnel factors as probable causes of accidents. Physical factors listed were inadequate guards and defective or improper equipment.

The jointer, arc welder, tilting arbor saw, and power grinder were involved in most of the accidents involving power tools. Hammers and handsaws were the most frequently involved hand tools. By comparison, power tools were involved in 117, or 76.5 percent, of the accidents, while hand tools were involved in 24, or 15.7 percent, of the accidents. Lumber was involved in three accidents and falls were responsible for three injuries. Materials and conditions were involved in 12, or 7.8 percent, of all accidents.

Instruction and demonstration of safety practices prior to operation of machines were found to be the most effective methods of promoting safety in the farm mechanics shop.

Teachers with written shop safety policies had an average of 1 injury per student compared to 1.3 injuries per student for those without stated shop policies. The combined effort of the teacher and the students was found to be the most effective method of formulating shop safety policies.

3215. SMITH, CLODUS R. *Attrition of Able Students in the College of Agriculture.* Staff Study, 1962, University of Maryland. 30 p. Department of Agricultural and Extension Education and Maryland Agricultural Experiment Station, University of Maryland, College Park.

*Purpose.*—The specific objective of the study was to ascertain the reasons given by former students who were not in academic difficulty at the time of withdrawal for discontinuing their education. A secondary objective was to determine former students' educational plans.

*Method.*—Withdrawees were identified each semester by the Director of Resident Instruction, College of Agriculture, by their failure to register for courses at the time of enrollment. Data were collected with an instrument specifically prepared for that purpose by mail survey from 102 former students who were not in academic difficulty at the time they withdrew.

*Findings.*—The number of capable undergraduate students who withdrew from the College of Agriculture during the 2-year period of this study was approximately equal to that of either of the two freshman classes entering during the same time period. The most frequently reported reason given by able students who withdrew from the College of Agriculture was a lack of sufficient funds to pay for college expenses. Going to work, lack of a sense of belonging, and lack of interest in their studies were reasons given by 10 percent or more of the former students as reasons for failing to complete a college education.

More than half of the withdrawees indicated they planned to continue the study of agriculture at the University of Maryland at a later date. Fewer than 5 percent reported that they intended to enroll in one of the other colleges at the University.

**3216. SMITH, CLODUS R.** Student Success in the College of Agriculture. Staff Study, 1961, University of Maryland. 42 p. Department of Agricultural and Extension Education and Maryland Agricultural Experiment Station, University of Maryland, College Park.

*Purpose.*—(1) To determine certain characteristics and experiences of students enrolled in the College of Agriculture; and (2) to identify subject matter areas in which students experienced difficulty.

*Method.*—Data were collected from University of Maryland records on all new students beginning their studies as first-semester freshmen in the College of Agriculture in the 1959-60 and 1960-61 academic years. Whenever possible and advisable, information regarding private, parochial, and public high school graduates was tabulated separately. In addition to tabular comparisons, treatment of data included the use of Kolmogorov-Smirnov One-Sample Test to determine statistical differences of college achievement between College of Agriculture students and the respective University freshman classes.

*Findings.*—A majority of resident students studying agriculture came from suburban and metropolitan areas. Approximately one student in four had lived on a farm 7 or more years. Twenty percent of the students had acquired no farm experience. More than 50 percent reported that their families had had no direct tie with a farm. About 65 percent reported that they had not participated in either FFA or 4-H Club activity. Having had a farm background influenced more students to enroll than did any other experience factor.

In terms of statistical differences, College of Agriculture students were found to compare favorably with the total University freshman class on the basis of scores earned on most entrance examinations. However, the College of Agriculture students' scores tended to be distributed disproportionately with a greater number falling in the lower half of the array.

**3217. SNIDER, BERNARD ALAN.** A Follow-up Study of Graduates in Vocational Agriculture in Williams County, Ohio. Thesis, M.A., 1963, The Ohio State University. 102 p. Library, The Ohio State University, Columbus.

*Purpose.*—(1) To determine the occupations selected by the graduates of vocational

agriculture and to identify reasons for their choice, especially as they pertain to farming; (2) to determine the phases of the vocational agriculture program that were most helpful; and (3) to determine changes that should be made to improve the program.

*Method.*—The graduates of vocational agriculture in Williams County during the years 1948 through 1962 who had 3 or more years of vocational agriculture were sent questionnaires. One hundred and ninety-one usable questionnaires were returned.

*Findings.*—The occupational classifications of the 176 graduates whose vocations could be determined were: 37 percent in nonfarm occupations; 29 percent in full-time farming; 18.7 percent part-time farming; and 15.3 percent in agriculture-related occupations. There were 11 graduates in college and 4 in military service.

The three major factors affecting occupational choice by graduates were: (1) The parents' opportunity and willingness to help the graduates to farm; (2) the amount of capital available to graduates; and (3) the graduates' farming opportunity which included size of farming program. A dislike for farming was found not to be a cause for graduates' not farming.

Livestock production and soils and crop production were rated the most helpful phases of instruction by graduates who were farming and the area of leadership was rated the most helpful by graduates not farming. The graduates indicated they had received help from their vocational agricultural training.

The graduates suggested that vocational agriculture should continue to provide actual farm experience and to include in the curriculum more emphasis on marketing, record keeping, farm management, and farm mechanics.

**3218. SNODDERLY, CHARLES HUGH.** Opinions of School Administrators Concerning Selected Aspects of the Program of Vocational Agriculture in East Tennessee. Thesis, M.S., 1962, University of Tennessee. 107 p. Library, Department of Agriculture Education, University of Tennessee, Knoxville.

*Purpose.*—The study was to determine the recommendations for vocational agriculture departments by east Tennessee secondary school principals, and county and municipal superintendents. The study was designed to appraise existing programs and to make recommendations for improvement. Appraisals were made of need, objectives, number of enrollees, course content, facilities, Future Farmers of America activities, supervised farming programs, and the effect of increased industry on vocational agriculture.

*Method.*—Data used in this study were obtained from 110 principals and superintendents throughout east Tennessee.

*Findings.*—Data indicated there were mixed opinions of east Tennessee administrators regarding vocational agriculture. Administrators thought rather highly of their programs and indicated that vocational agriculture is a necessary part of their curriculums.

This study shows that high school vocational agriculture training was needed by 84 percent of the respondents in order to do an efficient job of farming. Seventy-five percent of the administrators who had had vocational agriculture in their schools indicated there was a definite need for the program, and 64 percent specified that a full 4-year course should be offered.

Most of the administrators stated that the controlling purpose of the course was to provide basic training in agriculture which would be applicable to agricultural occupations and give a general, broad knowledge of agriculture and related fields.

Less emphasis was placed on the value of the young farmer and adult programs by administrators than by vocational agriculture teachers.

Most of the administrators agreed that supervised farming programs were a necessary part of the vocational agriculture program but emphasized them less than did vocational agriculture teachers.

Some concern was expressed by administrators as to the academic teaching load recommended for vocational agriculture teachers. Many administrators feel that the vocational agriculture teachers should have more students in their classes or teach classes in other areas. Only 40 percent indicated that the duties of a teacher should be confined entirely to the vocational agriculture program.

3219. SOLSTAD, ARNOLD KALMER. A Study of the Relationship Between Income of Farmers in the Minnesota Vocational Agriculture Farm Management Service and Their Activities in the Farm Power and Machinery Area with Implications for a Course of Study. Dissertation, Ph. D., 1963, University of Minnesota. 128 p. Library, University of Minnesota, Minneapolis.

*Purpose.*—To determine a basis for a course of study in farm power and machinery and to learn other facts about farmer activities in this area.

*Method.*—Information was gathered from 100 Minnesota vocational agriculture farm management service records and from a survey of the 100 farmers, who had consecutive records for 1959, 1960, and 1961. Dollars spent in total repairs and upkeep of tractors and machinery, dollars earned in custom work off the farm, the number of special tools owned out of 20 selected tools, the percent of maintenance jobs done by the operator, the total

inventory of tractors and machinery, total expenses of power and machinery, and dollars spent in new purchases were correlated with labor earnings. All data were from the means of the 3 years, which tended to stabilize trends. Multiple correlation, analysis of variance, and chi-square procedures were used to analyze the data.

*Findings.*—Total expenses of farm power and machinery and dollars spent on repairs and upkeep in this area correlated at the 1-percent level with labor earnings. Dollars earned in custom work off the farm, total inventory of power and machinery, and money spent in new purchases correlated significantly with labor earnings at the 5-percent level.

Over 75 percent of the farmers did the listed maintenance jobs on tractors and almost 100 percent of them did their own maintenance work on plows and mowers. Over 75 percent of the farmers did minor repair work on their tractors and almost 100 percent did such jobs on plows and mowers. Jobs that required special tools such as sharpening shares and welding were done by few farmers. Farmers do not give their machinery maintenance service as often as recommended by manufacturers. Farmers obtain more of their information in this area from dealers than from vocational agriculture teachers. Many farmers were attempting to do complex jobs with inadequate tools. It was concluded that all maintenance jobs should be taught, and most repair jobs on the mower and plow. Minor repair jobs on the tractor would also have to be included. More time should be spent on selection of machinery.

3220. SORENSEN, FRED ARNOLD. Procedures for the Comparative Analysis of Crop and Livestock Enterprises. Thesis, M.A., 1962, University of Minnesota. 40 p. Department of Agricultural Education, University of Minnesota, St. Paul.

*Purpose.*—To develop procedures for the comparative analysis of crop and livestock enterprises and to show by example how this information can be gathered, processed, presented, and used in the teaching of farm management to farmers.

*Method.*—First, the present farm business analysis system used in the Thief River Falls Area Vocational Technical School Analysis Center was examined to determine what additional analysis information was needed and obtainable to compare crop and livestock enterprises. Second, work sheets were designed to be used in assembling and processing the needed information and to establish an enterprise report form that would be understandable to the farmer. The third step was to show how the crop and livestock records from an exemplary farm could be so analyzed. The final step was to point out how the above assembled information might be used in teaching farm management.

*Findings.*—The proposed system of analysis stressed three factors frequently overlooked in evaluating a farming operation. These were: (1) The significance of the net returns from crops raised to produce feed for a livestock enterprise; (2) the importance of a comparative analysis of different types of livestock on the same farm; and (3) the consideration of costs other than feed in evaluating a livestock enterprise.

It was recommended that the system be extended to other areas and that the resulting information be evaluated with regard to its validity, reliability, usefulness in the teaching of farm management to farmers, usefulness in farm planning and acceptance by farmers, agriculture teachers, and professional farm management personnel. It was further recommended that the entire format of the analysis report now being used be reviewed and that an effort be continued to include more information of value to the farmer and in such form as will be understandable to him.

3221. STENHOLM, CHARLES W. Evaluation of High School Curriculum and Occupational Status of Jones County Male High School Graduates—1952, 1953, and 1954. Thesis, M.S., 1962, Texas Technological College. 68 p. Library, Texas Technological College, Lubbock.

*Purpose.*—To evaluate the importance of vocational agriculture in the high school curriculum in comparison with the importance of other courses which were offered in the Jones County high schools. This importance was to be correlated to the present occupational status of the high school graduates.

*Method.*—The permanent records of five Jones County, Tex., high schools were used in securing names and high school courses of study of the various graduates. A questionnaire was developed and mailed to 207 graduates whose addresses were located. Returns were secured from 148 graduates, 72 percent of those contacted. The 148 graduates replying represented 54 percent of the total male high school graduates of the period of the study.

*Findings.*—Twenty-eight percent of the graduates were still living in Jones County; 19 percent were living outside of Jones County but within 100 miles of their home county; 38 percent were living in Texas but more than 100 miles from Jones County; and 15 percent were living outside the State of Texas.

Twenty-seven percent of the graduates were employed in occupations classified as professional; 19 percent were in sales and clerical; 20 percent were in nonmanufacturing; 10 percent were farming; 6 percent were in managerial or office; 4 percent were business proprietors; 3 percent were foremen; 3 percent were in agriculture-related occupations; 2 percent were in semiprofessional occupations; 2

percent were in the armed services; 3 percent were students; and 1 percent were making the military a career.

Fifty-one percent of the graduates were completely satisfied in their present occupations. Forty-nine percent of the graduates were earning more than \$6,000 per year. Job satisfaction increased as salary increased. College graduates were more satisfied in their occupations than noncollege graduates, and there was no appreciable difference between vocational agriculture and non-vocational-agriculture graduates in salaries received and in occupational satisfaction. Non-vocational-agriculture graduates tended to go into professional occupations to a greater degree than did vocational agriculture graduates.

Mathematics was rated the most important course taken in high school. English grammar was rated second. Science and vocational agriculture were rated equally important by the graduates who did not go to college.

Only 18 percent of the graduates indicated they had received any occupational guidance while they were in high school. The vocational agriculture teacher accounted for 31 percent of the guidance received.

Sixty-four percent of the graduates had attended college for at least one semester. Forty percent of the graduates had earned a bachelor's degree, 7 percent a master's degree, and 3 percent a doctor's degree. More of the non-vocational-agriculture graduates had gone to college, and more had graduated from college.

Sixty-five percent of the graduates had served in the military services, where 45 percent had received occupational training. Thirty-seven percent were using this training in their present occupations.

3222. STRICKLING, BRUCE HARVEY. Testing Procedures Used With High School Classes by Ohio Vocational Agriculture Teachers. Thesis, M.A., 1961, The Ohio State University. 120 p. Library, The Ohio State University, Columbus.

*Purpose.*—To identify: (1) Testing procedures used by Ohio vocational agriculture teachers; (2) needed assistance in testing; (3) attitudes of the teachers toward the educational value of testing; and (4) testing aids needed by the teachers.

*Method.*—The data were secured from a questionnaire completed by 143 Ohio teachers of vocational agriculture in May 1961, and concerned testing procedures used in their classes during the past year.

Comparisons were made between procedures used by the random sample of Ohio teachers and a group of 70 superior teachers selected by the district supervisors. Testing procedures studied were frequency of testing, time

used in testing, methods of administration, and the kinds of questions used.

*Findings.*—Ohio teachers make extensive use of paper and pencil tests as a part of their classroom instruction. Five percent of their teaching time was devoted to administration of tests, including semester, 6 weeks, and end-of-unit tests and short quizzes.

Teachers generally followed approved practices in testing; however, the sample group did not test as much as did the superior group.

Testing aids desired by the teachers included unit tests, standardized achievement tests, and noncredit testing workshops.

3223. SUTHERLAND, SIDNEY S., and SAMS, W. EARL. *Biological Principles in Agriculture*. Staff Study, 1963, University of California, Davis. 133 p. California State Department of Education, Sacramento.

*Purpose.*—To develop content and teaching suggestions for use by high school agriculture teachers in integrating biological principles with instruction of agriculture, and to determine if high school students in vocational agricultural classes could master this material.

*Method.*—The study was conducted in 3 phases: (1) A developmental phase in which 3 researchers, 2 with high school teaching experience, developed the original material which was in turn reviewed and edited by university, State college, and junior college faculty members, biological consultants, and teachers of high school agriculture; (2) an experimental phase in which the content was taught and results evaluated in 9 experimental and an equal number of control classes; (3) a final phase in which revised material was taught in 17 additional schools and revisions made on the basis of the experiences of these teachers. More than 75 researchers, professors, instructors and teachers of biology and agriculture aided in the development of the teaching content.

*Findings.*—It seemed feasible and practical to teach biology integrated with agriculture in high school agriculture classes. Students in experimental classes developed a greater understanding of biological principles than students in control classes. Average gain from pretest to posttest scores for the experimental group was approximately five times that of the control group. Subjective evaluations of teachers conducting experimental classes indicated that this content might be taught in any of the 4 years of high school, that it made the study of agriculture more challenging to high school students, but that its inclusion might eliminate some agriculture content now usually taught.

The team approach used in this curriculum study, in which university and other special-

ists and researchers in agriculture and biology worked with agriculture teachers and educational specialists, proved highly effective.

3224. SUTHERLAND, SIDNEY S. and THOMPSON, O. E. *Developing Agricultural Business Curricula in California Junior Colleges—Five Years' Experience*. Staff Study, 1962, University of California. 21 p. California State Department of Education, Bureau of Agricultural Education, Sacramento.

*Purpose.*—To evaluate and summarize the results of a 5-year experimental program in agribusiness education in California junior colleges.

*Method.*—An evaluation conference was held at which chairmen of agriculture departments in five junior colleges reported to supervisors of agricultural education, business education, and representatives of agricultural businesses the results of 5 years' experience with pilot agricultural business curriculums. Industry representatives were then asked to describe their needs for junior college graduates trained in agribusiness and to react to the type of training offered in these institutions.

*Findings.*—Each institution reported that changes were being made in its agribusiness curriculum each year. Agribusiness curriculums remained primarily the concern of agricultural departments, with business classes integrated into the programs. Several programs set up originally as strictly occupational training curriculums have been adjusted to accommodate students preparing to transfer to 4-year institutions. The programs have grown and will continue to grow. Enrollments in agriculture, including agribusiness curriculums, in the 5 schools totaled nearly 800 with some having doubled and tripled in enrollment during the 5-year period.

Agricultural industry representatives were largely unaware of the availability of junior college graduates prepared for positions in agricultural business. Agricultural experience and thorough preparation in agriculture were still basic to most positions in agricultural business. Junior college preparation seemed adequate for many persons employed in agricultural business, especially at the technician, sales, service, and sometimes managerial level. The ability to communicate, by means of both the written and spoken word, was judged to be a requisite for practically any job in agricultural industry. Regardless of the plan of organization used by a college in establishing a curriculum in agribusiness, coordination and cooperation among the departments and staff members concerned were thought to be absolutely essential. The cumulative experiences of these five junior colleges during the previous 5 years indicated that there was a need for this type of curriculum and that appropriate training for many

positions in agricultural business and industry could be provided by these institutions.

3225. TAYLOR, LEWIS C. A Delineation of Farm Mechanics Managerial Competencies for New York State Dairy Farming and an Interpretation of Their Use in the Preparation of Courses of Study. Dissertation, Ed. D., 1962, Cornell University. 193 p. Library, Cornell University, Ithaca.

*Purpose.*—To: (1) Identify managerial decisions which dairy farmers in selected New York State counties had made in the operation of their dairy farms; (2) secure the farmers' opinions of the importance and frequency of each decision; and (3) prepare suggested lists of managerial decisions which could be used in the preparation of courses of study for high school students and for young farmers in New York State. Two hypotheses in this study were: Size of the herds and age of the farmers cause no significant difference in the decisions made by New York State dairy farmers in selected counties in the operation of their dairy farms.

*Method.*—Responses to a validated questionnaire were obtained from 162 farmers in 19 counties of the central plain and plateau region of New York State. The farmers checked only those decisions which they had made in their dairy farming and indicated their opinions of the importance of each decision and the frequency with which it was made. The farmers were classified as owners of three herd-size groups and as being themselves of two age groups. The responses were compared to determine if there were differences due to herd size or farmer's age in the operation of their dairy farms.

*Findings.*—Two lists of managerial decisions were prepared, based upon ranking according to commonness, importance, and frequency. Eighteen of the most frequently occurring decisions were suggested for use in planning high school programs. Sixty-two decisions occurring less frequently but ranking high in the factors of importance and commonness were suggested for use in planning young farmer programs.

Herd size and age of farmers were related to few significant differences in farm mechanics decisions made by dairy farmers. In the area of farm power and machinery the farmers were concerned with decisions which related to the best use of their time and to overall planning as well as with decisions relating to selection of machinery and equipment. The selection of primary tillage equipment and of hay production equipment was of importance. Problems of fencing, such as fence arrangement and selection of fencing materials, were significant.

Decisions centering around the dairy production buildings were of primary importance.

Dairy farmers were more concerned with the selection of hand and power tools to go in the farm shop than they were with the planning of the shop itself. Planning wiring layouts and selecting electrical equipment were important jobs for dairy farmers.

The implications from this study were that since there are definitely many specific decisions to be faced by farmers in the operation of their dairy farms, the process of decision making and its application should be included in vocational agriculture programs. Furthermore, the decisions which are actually made on the farms are those which should be taught in the high school, young farmer, and adult programs.

3226. TAYLOR, ROBERT E. An Inservice Education Program for State Supervisors of Vocational Education in Agriculture. Dissertation, Ph. D., 1961, The Ohio State University. 483 p. Library, The Ohio State University, Columbus.

*Purpose.*—To aid in the development of an inservice education program for State supervisors of vocational education in agriculture.

*Method.*—A national group of authorities in State supervision was utilized in formulating 16 guiding principles and a list of 160 professional competencies used in a questionnaire.

Head and staff supervisors in the 48 contiguous States, excluding the writer's home State of Arizona, were surveyed concerning their personal inservice training needs, with 89 percent responding. Their responses were validated with 30 selected chief State school officers and State directors of vocational education.

Data were programed on the IBM 704 computer. Treatment of data involved *t*- and *F*-tests, rank order correlation, and multiple regression.

*Findings.*—Supervisors indicated a need for "considerable" inservice training in 93 of the competencies and "some" training in the remainder. Supervisors and their superiors differed significantly on the level of training needed by supervisors on 31 of the 160 competencies.

The four major areas of training needs were: Evaluation of the supervisory program, evaluation of local vocational agriculture programs, cooperative development of a program of public relations, and leadership in educational planning.

The position of head State supervisor and the regional location of the respondent exerted the greatest influence on individual training needs. Course work in supervision and administration, number of years of teaching experience, proximity to retirement, number of years in supervision, and type of graduate degree exerted relatively little influence.

Lack of time, funds, and suitable training activities were the major factors restricting

supervisors' participation in inservice training. Less than one-half of the supervisors had provisions for professional leave. Supervisors generally were unfamiliar with personnel policies affecting them. Under existing policies supervisors were found to have little financial incentive to work for advanced degrees.

**3227. TERRY, HOWARD ROBERT.** Administrative Practices and Costs of Providing Consumable Supplies and Materials for Farm Shop Instruction in Oklahoma Vocational Agriculture Departments. Thesis, M.S., 1962, Oklahoma State University. 76 p. Library, Oklahoma State University, Stillwater.

*Purpose.*—To: (1) Determine the administrative policies and practices used in financing farm mechanics programs and factors affecting these practices; (2) compute an average cost per student-hour of instruction for farm shop consumable supplies; (3) determine differences between administrative practices preferred by superintendents and those actually used in vocational agriculture departments; and (4) obtain information relating to the operation of a farm shop program.

*Method.*—Case studies were conducted in eight schools to arrive at costs per student-hour of farm shop instruction for consumable supplies. Questionnaires were sent to 70 superintendents and vocational agriculture instructors relating to administrative preferences favored and being used in their schools.

*Findings.*—(1) The average cost per student hour of instruction for consumable supplies was \$.086; (2) the nature and extent of the farm shop program was not limited by cost of providing instruction or size of the farm shop, but was limited by teacher experience; (3) FFA earnings were being used for farm shop financing to an extent not favored by the superintendents; (4) farm shop fee policies did not agree with superintendents' preferences; (5) persons allowed to use facilities were in agreement with superintendents' preferences; (6) instructors were not in favor of charging shop fees to all-day students, but favored a fee for young and adult farmers and others using shop; (7) teachers favored including vocational agriculture funds within the total school budget; (8) the percent of cost of consumable supplies charged to students did not influence the amount of shop fees charged; (9) students should pay for supplies and materials used on take-home projects; (10) teachers kept adequate farm shop records with the exception of inventory; and (11) established cost lists for consumable supplies were not used in the majority of schools charging for these supplies.

The writer's conclusion was that the administrative policies should be formulated with the superintendents and other school officials, and should fit local needs and situations.

**3228. THOMAS, JAMES DONALD, JR.** A Comparative Study of Initial Achievement of Agricultural College Students. Dissertation, Ph. D., 1960, Purdue University. 164 p. Library, Purdue University, Lafayette.

*Purpose.*—To determine whether there were significant differences in initial college achievement among classified groups of agriculture students at Purdue University.

*Method.*—Data were obtained from the Office of the School of Agriculture and the Office of Admissions of Purdue University. The study included 603 freshmen who entered the School of Agriculture in the fall semesters of 1957, 1958, and 1959. The sample included only male students who were graduates of Indiana high schools, who came directly to college from high school, and for whom complete data were available. For purposes of comparison, these students were divided into three basic groups: (1) Students not having studied high school vocational agriculture; (2) students having one or two units in high school vocational agriculture; and (3) students having three or more units in high school vocational agriculture. In addition, the achievement of the students was compared when they were grouped according to farm or nonfarm background and when they were grouped with respect to subject matter background in high school language arts, mathematics, science, social studies, and business education.

Initial achievement was measured by: (1) First-semester grade-point index; (2) first-year grade-point index; and (3) grade points received in selected first-year college courses in agriculture, science, mathematics, English, and speech. A two-way classification analysis of covariance was used to determine whether there were significant differences among groups in initial achievement, with high school rank controlled.

*Findings.*—Significant differences at the .01 level were found among the three basic groups with respect to the first-semester grade-point indices. The adjusted criterion mean was highest for students not having studied vocational agriculture. Significant differences were not found between the farm and the non-farm students and among subject matter background groups.

No significant differences at the .05 level were found among the three basic groups with respect to the first-year cumulative grade-point indices. This was also true for both the farm and nonfarm background groups and all subject matter background groups except science. Students who had more than two units in high school science excelled.

When the students in the sample were divided into the 3 basic vocational agriculture groups and farm and nonfarm background groups, there was a significant difference in only 1 of 10 first-year college courses. In an

introductory animal husbandry course the students with the most vocational agriculture had the highest grades. No differences were found between the farm and nonfarm background groups. Students having more than three units in high school language arts had higher grades in college English composition. Students having more than two units in mathematics excelled in college chemistry and algebra grades. Students who had more than two units in high school science had higher grades in college chemistry, zoology, and farm mechanics courses.

3229. TRUMP, KENNETH E. An Evaluation of Vocational Agriculture by Ohio School Administrators. Thesis, M. Sc., 1931, The Ohio State University. 77 p. Library, The Ohio State University, Columbus.

*Purpose.*—This study was designed to secure the opinions of school administrators regarding selected aspects of the program of vocational agriculture in Ohio.

*Method.*—The data used were secured from an evaluative instrument which was submitted to all 331 Ohio school administrators with departments of vocational agriculture. The number of administrators responding was 244, or 73.7 percent. The evaluation instrument contained 65 selected criteria which were classified into the following areas: Future Farmers of America; supervised farming; physical facilities; State supervision and service; public relations; administrative concerns; teaching methods; adult and young farmer program; and program planning.

The administrators were asked to rate the criteria on a 5-point scale. The scale was graded with 5 points given for "complete agreement," 4 points for "some agreement," 3 points for "partial agreement and partial disagreement," 2 points for "some disagreement," and 1 point for "complete disagreement."

So that the findings could be better interpreted, the average weighted rating for each criterion was calculated. The average rating for each of the nine major areas was also calculated, and the percentage of administrators that responded to each of the values from 1 to 5 for each respective criterion was shown.

*Findings.*—The study revealed that the administrators gave the highest ratings to the FFA and farming program areas. The lowest ratings were in the areas of adult and young farmer programs and program planning. The study showed no major weakness, as the overall rating given the study was 4.02, and only 2 of the 65 criteria were given a rating below 3.

Some administrators asserted that the program probably could be improved by placing more emphasis on the following:

1. Housekeeping in many shops could be improved.

2. Public relations activities could be strengthened.
3. Classroom work could be made more challenging to high school students.
4. A better job could be done to acquaint the school faculty with vocational agriculture.
5. Conference periods as stipulated in the Ohio plan could be used more effectively.

3230. UTTECH, RALPH O. Educational and Occupational Guidance of Male High School Students of Five Selected Wisconsin Counties, with Special Emphasis on Influencing Factors. Thesis, M.S., 1962, University of Wisconsin. 135 p. Department of Agricultural and Extension Education, University of Wisconsin, Madison.

*Purpose.*—To determine the factors that had an effect upon the guidance of male high school youth in Wisconsin, especially which person(s) or agency(-ies) gave guidance to students and to what degree, and which person(s) or agency(-ies) gave the most influential guidance to students; and to determine the characteristics of the male high school students who were furnished guidance, as to which intellectual ability group of students received the most guidance, and what effect residence had upon the extent to which the student was provided with guidance.

*Method.*—The group studied consisted of 872 male youths in 29 high schools in 5 counties in Wisconsin. The counties—Adams, Iowa, Manitowoc, Polk, and Price—were chosen on the basis of several criteria. The students completed a 7-page questionnaire when they were high school seniors. The questionnaires were distributed by personal contact and then administered by school personnel who returned them to the author. The data on mental ability were measured by the Henmon-Nelson Test of Mental Ability, and course grades were taken from school records.

*Findings.*—There were 235 students who dropped from the study population over the 4-year period of followup, 110 being students who dropped completely out of school. There was a definite lack of guidance influence upon freshmen, which was remedied somewhat as the students became sophomores and juniors, but then reappeared as the students proceeded through the senior high school year.

The parents were the most influential source of guidance. They were of great influence upon the students as freshmen. During sophomore and junior years the students tended to move away from parental influence, which again increased during senior year.

The guidance director as an individual guidance source was not extremely influential with the total school population, but only 17 percent of the schools had a full-time guidance director. He did have the most influence upon

the students with higher intellectual ability and academic capability and those planning to attend college.

The students indicated that reading had a high degree of influence upon them, underscoring the importance of having good educational and occupational reading material available.

A definite trend was indicated for the agriculture teacher to be the most influential for rural youth, less influential for rural nonfarm youth, and least influential for urban youth. The agriculture teacher was shown to work closely with rural youth but often to have little contact with the other groups.

**3231. VAN BUREN, PAUL E.** Employment Opportunities and Training Needs in Selected Farm-Related Occupations in Central Ohio. Thesis, M. Sc., 1962, The Ohio State University. 141 p. Library, The Ohio State University, Columbus.

*Purpose.*—To determine the relative importance of 12 selected occupations closely related to agriculture in central Ohio, and to provide, for the guidance of future students, information concerning these occupations and the preparation needed to enter any one of them.

*Method.*—Selection of the occupations was based primarily on past Ohio and New York State studies. Occupations believed to require a collegiate preparation were excluded.

Information was obtained by mailed questionnaires and personal interview. In the 6 counties surveyed, 194 firms responded with data for 278 selected occupations. Agriculturally trained employees in responding firms were also surveyed.

A 25-percent sample was taken of nonresponding firms to determine their nature and reason for nonresponse.

*Findings.*—There were 103.4 job opportunities reported and 162.5 estimated as available annually in central Ohio in the selected occupations, an average of 5.4 per department of vocational agriculture. Meat-packing plants provided the greatest number—19.8 percent—and farm machinery firms were second with 16.7 percent of all opportunities. Greenhouses, nurseries, and livestock markets afforded the fewest opportunities, making up only 5.6 percent of the total number. About three-fourths of all opportunities were in firms dealing with farm machinery, feeds, special farm supply, meat, and dairy products.

The highest starting weekly salary was \$72.30, or \$1.56 per hour, paid to farm machinery salesmen, whereas livestock marketing firms paid only \$52.33. Salesmen of horticulture and greenhouse products received the lowest starting salary, \$1.22 per hour, and truck drivers were next with \$1.30 per hour. Salesmen for farm machinery firms and lumber firms received the highest maximum salary of \$2.40 per hour.

A high school education or more was required by 61 percent of the employers and preferred by 89 percent. One-half preferred training in vocational agriculture; 14.8 percent, in high school business; 12.7 percent, technical post high school courses; and 9.4 percent, high school trade.

**3232. VERY, JOSEPH J.** Revision of Swine Analysis Sheets and Comparison of Efficiency Factors and Labor and Management Income in Vo-Ag Swine Enterprises. Thesis, M. Ed., 1963, The Pennsylvania State University.

*Purpose.*—To assemble and appraise information from several sources in order to revise the swine breeding and swine finishing enterprise analysis sheets used in instruction in vocational agriculture.

*Method.*—Production data for high school student swine breeding and swine finishing enterprises in 1961 and in 1962 in the Blair-Bedford-Fulton County area of Pennsylvania were compared with data for similar student projects in all of Pennsylvania entered in the State contests in the 2 years. Consultation with specialists in the Department of Animal Industry and Nutrition at Penn State and examination of comparable analysis sheets used in Iowa and Illinois guided the revision of items and of the efficiency standards.

*Findings.*—Efficiency factors selected for emphasis on the swine breeding analysis sheet are: (1) Percent of live pigs farrowed, raised to weaning; (2) average number of pigs per litter raised to weaning; and (3) average litter weight at 56 days—separate standards for gilts and sows. The factors on the swine finishing analysis sheet are: (1) Final market live weight per hog; (2) live gain per day per hog from weaning to market; and (3) pounds concentrates per 100 pounds gain. Labor and management income data are included. Space is provided for subjective appraisal of practices and conditions that contributed to superior efficiency or that limited the production and income.

The efficiency factor averages were higher in 1962 than in 1961 and higher in the select groups of records entered in the State contest. Prices received in 1962 resulted in lower income per animal. Students whose records were taken from a single enterprise project record book had higher efficiency but smaller scope and total income than those whose swine enterprises were part of a multienterprise operation with records kept in a farm account book.

The new analysis sheets have omitted all information not needed for the specific purposes listed above. They should be effective as a teaching aid in student budgeting, good setting, and decision-making.

**3233. WALKER, DONALD B.** Opinions and Attitudes of Superintendents and

**Principals Toward Vocational Agriculture in High Schools in Minnesota.** Thesis, M.A., 1961, University of Minnesota. 89 p. Library, University of Minnesota, Minneapolis.

*Purpose.*—To obtain opinions and attitudes of superintendents and principals of high schools where vocational agriculture is taught in Minnesota concerning: Importance of selected summer activities in the vocational agriculture program; performance of vocational agriculture instructors in various areas of the vocational agriculture program; certain aspects of vocational agriculture enrollment; and a course of study.

*Method.*—Identical questionnaires were submitted to superintendents and principals of 100 high schools in Minnesota having single-teacher vocational agriculture departments to determine their opinions regarding: The relative significance of each of 8 areas of the summer program in vocational agriculture; the performance of vocational agriculture instructors in 15 areas of the vocational agriculture program; the nature of the vocational agriculture program; the need for a course of study; and the need for a course designed specifically for students not intending to farm but who are interested in some other phase of agriculture.

*Findings.*—The eight summer activities ranked from most important to least important as indicated by the superintendents' and principals' responses were: Individual on-the-farm instruction; supervising trial plots, school farms, or other teaching demonstrations; department maintenance and administration; revising lesson plans and preparing teaching aids; summer conferences and workshops; conducting tours and meetings; participation in county and State fairs; and summer school attendance.

The majority of superintendents and principals ranked their vocational agriculture instructor "average" to "strong" in their performance in the 15 areas of teaching.

The majority of superintendents and principals agreed that: (1) Vocational agriculture should be an elective for all boys; (2) a course of study in agriculture should be designed for statewide application in Minnesota with adaptations to fit the needs of the local community; and (3) a course should be designed specifically for students who do not intend to farm but are interested in a career in some other phase of agriculture.

3234. WALKER, ROBERT W. Development of a Vocational Agriculture Interest Inventory for Guidance of Eighth Grade Students. Dissertation, D. Ed., 1962, The Pennsylvania State University. 117 p. Library, The Pennsylvania State University, University Park.

*Purpose.*—To develop and test a key for each of two interest inventories based on the items that separated eighth-grade boys who were rated as "successful vo-ag students" at the end of the ninth grade from "other students" who were not enrolled in vocational agriculture.

*Method.*—A reference group of 1,000 13- and 14-year-old eighth-grade boys in 20 high schools was tested with the Kuder Preference Record—Occupational, Form D and the Pennsylvania Vocational Agriculture Interest Inventory. The criterion group was identified 1 year later as the "successful vo-ag students," based on judgment of the teacher, counselor, and principal and on the student's intention to continue in agriculture in the 10th grade.

Item analysis of student responses in the reference group and in the criterion group located answer positions with percentage differences significant at the .05 level for 32 items of the Kuder—Occupational, Form D and for 75 items of the Pennsylvania Vocational Agriculture Interest Inventory. The Kuder Vo-Ag Key and Pennsylvania Vo-Ag Key punched for the significant items, along with the published Kuder Farmer Key, were used to score the eighth-grade student test papers.

*Findings.*—The numbers of item answer positions on which the responses of the "successful vo-ag students" were significantly different were sufficient to justify the construction of a Kuder Vo-Ag Key and a Pennsylvania Vo-Ag Key. Seventy-one percent of the 132 "successful vo-ag students" with acceptable Kuder verification scores were classified high when the Kuder Vo-Ag Key was applied to their eighth-grade test papers. Also, 71 percent of 168 "successful vo-ag students" had high scores on the Pennsylvania Vo-Ag Key. When a validation group totaling 120 students in one school a year later was studied, the percentages of "successful vo-ag students" with high scores were 89 and 84 percent.

Correlations between scores on each two of the keys, the Kuder Vo-Ag, Pennsylvania Vo-Ag, and Kuder Farmer, were positive and significant. High scores on the interest inventory keys were associated with student characteristics that included having fathers who farm, the students' own farming experience, desire of students to enroll in vocational agriculture, and students' awareness of parents' encouragement to enroll in vocational agriculture.

3235. WALL, JAMES EUGENE. The Utilization of Michigan State University Agriculture Publications in Selected Vocational Agriculture Activities. Dissertation, Ph. D., 1962, Michigan State University. 223 p. Library, Michigan State University, East Lansing.

*Purpose.*— To determine the nature of use and extent of use of college of agriculture publications in vocational agriculture instruction.

*Method.*—A sample of 24 publications, stratified according to a distribution classification and randomly selected from within strata, was analyzed in terms of 18 vocational agriculture activities. Data were obtained by means of a depth interview technique from 25 Michigan teachers who had been teaching vocational agriculture a minimum of 2 years, and who had been in the same department 1 or more years.

*Findings.*—Examples of activities in which the publications were used are: Professional growth and self-improvement of teachers; supervised study; individual instruction; review by teacher prior to introducing the topic in adult classes; assisting students to identify main ideas; small group instruction; use in "decision-making" for student farming programs; use by students to make individual reports; and browsing or leisure-time reading by students.

Composite extent-of-use scores indicated that publications in Class C (popular) were used to a significantly greater extent than those in Class B (semitechnical), and those in Class B were used to a significantly greater extent than those in Class A (technical).

Correlation coefficients computed for composite extent-of-use scores of publications and their mean raw scores for readability approached zero. Low correlation coefficients indicated that readability of publications was not associated with the extent to which they were used.

Teachers thought timeliness, ease-of-reading, and adaptability to local conditions were features which all publications should possess. The *Available Publications* list and the *Agricultural Education Service Letter* were the two main agencies by which teachers maintained an awareness of publications releases.

Findings concerning utilization imply that: (1) Publications use may have relevancy to the teachers' perceptions of their roles as educators; (2) teachers may be considered as a primary audience of the agricultural scientist; (3) extent of publications use for teacher self-improvement may be an index of the vocational agriculture teacher's contribution to the "2-step" flow of agricultural information; and (4) effort needs to be expended in determining suitability of publications before students use them.

Most teachers allow students free access to publications. Over half of the teachers kept single copies in their files for personal use, and maintained separate storage of multiple copies for student use. Twenty percent of the teachers had adopted the AGDEX indexing system for filing publications.

3236. WALTER, JOHN C. A Study of the Occupational Opportunities and Requirements in Ornamental Horticulture in

Montgomery and Prince Georges Counties, Maryland. Thesis, M.S., 1963, University of Maryland. 152 p. Library, University of Maryland, College Park.

*Purpose.*—(1) To determine employment opportunities in Prince Georges and Montgomery Counties for high school graduates in ornamental horticulture; (2) to determine technical and business training needs of such prospective employees; and (3) to establish a basis for constructing a high school course of study in ornamental horticulture for such students.

*Method.*—A survey was made of all 67 businesses in the 2 counties which were engaged in producing, serving, and selling ornamental horticultural products.

*Findings.*—(1) Although many of the nursery operators were graduates of a 4-year college, most were not. Almost all of the nurserymen indicated that the higher positions in a company demanded advanced training, not necessarily at college level. They also suggested that employees be encouraged to take short courses in horticulture whenever the opportunity was available.

(2) Most of the nursery owners were not satisfied with the educational background of their employees. They were especially concerned with the fact that most of their employees lacked training in business education. All indicated that they were willing to pay higher wages for higher caliber personnel.

(3) Approximately one-half of the nurserymen indicated that they were planning expansion of their businesses. They revealed that, along with this growth, they could see the need for additional personnel.

(4) The nurserymen suggested that the educational system, whether it be high school, college, or vocational-technical school, make provision for training its students in those phases of business education dealing with salesmanship, merchandising, accounting, and business operation. They also insisted that more emphasis be given to the practice of skills learned, with less stress on purely academic work.

(5) Most nurserymen indicated that employees who had at least a high school background in horticulture had a better chance of advancement in the company than those who lacked equal training. It was pointed out by the nurserymen that such a program could help the student to learn and practice skills and understandings which are essential to this vocation.

(6) There was a definite need for certain high schools to attract promising young people into the horticultural field. Not all persons will become college graduates; the others must be trained on the secondary level.

(7) Most nurserymen were interested in obtaining qualified nursery workers. They are very willing to cooperate with the public

schools in assisting and advising in the training of future nursery personnel.

3237. WARD, WALTER ELMER. *A Study to Determine the Agricultural Training Necessary to Meet Some of the Needs of Rural High School Students in Western Alaska*. Thesis, M.S., 1962, Washington State University. 66 p. Library, Washington State University, Pullman.

*Purpose.*—The aim of this study was to determine the agricultural training necessary to meet some of the needs of rural high school students in western Alaska, assuming that there is a need for agricultural training in the schools covered by the survey and that an agricultural curriculum may be determined by a survey of each local community.

*Method.*—The schools and communities of Kenai, Homer, Wasilla, and Fairbanks in the heart of the farming areas of Alaska were included in this survey. Procedures for the collection of data included visits to the schools and communities, and interviews with the students and parents. Information was also gathered from local organizations, public agencies, school board members, and school administrators through questionnaires, visits, and observations. Data were collected on the extent and type of farming operations engaged in by parents of prospective students and their opinions relative to the order of importance of various phases of vocational agricultural training.

*Findings.*—A suggested course of study based upon the survey was developed, recognizing that facilities and farming conditions vary from community to community and that the local and advisory boards are in a position to determine the emphasis to be placed on the specific areas of instruction.

3238. WARMBROD, JAMES ROBERT. *State Policies for Distributing State and Federal Funds for Vocational Education in Agriculture to Local School Districts*. Dissertation, Ed. D., 1962, University of Illinois. 291 p. Library, University of Illinois, Urbana.

*Purpose.*—To identify State policies for reimbursing local school districts in 1960-61 for programs of vocational education in agriculture and any differences in programs of vocational education in agriculture associated with different State systems for reimbursing local school districts.

*Method.*—Data were obtained from questionnaires returned by State supervisors of agricultural education in 48 of the 50 States. Federal and State statutes and appropriation acts were used as primary sources of data. The nine States selected for a study of policy and program changes were California, Con-

necticut, Illinois, Indiana, Kentucky, New York, Utah, Virginia, and Wisconsin. Data for these States were obtained from State plans and annual financial, statistical, and descriptive reports on file in the U.S. Office of Education, and through correspondence or an interview with the State supervisor of agricultural education in each State.

*Findings.*—More than 40 States had adopted policies which provided reimbursements from State or Federal funds for a portion of the following costs incurred by local boards of education: Salaries paid teachers of vocational agriculture for teaching all-day classes; salaries paid regular teachers or special instructors for teaching young farmer and adult farmer classes; and travel expenses. Nine States provided reimbursement for a portion of the costs of instructional equipment and supplies.

State and Federal funds for vocational education in agriculture were distributed most frequently to local school districts as reimbursement of a percentage of the expenditures incurred. Other methods of distributing funds were: (1) Reimbursement as flat grants per school, per student, per approved young farmer or adult farmer class, or per hour of out-of-school instruction; (2) reimbursement on the basis of a sliding scale whereby newly established programs received a higher rate of reimbursement; (3) reimbursement as additional salary for summer work; and (4) reimbursement on the basis of an excess cost formula.

The study of policy and program changes in the nine States from 1951 to 1960 indicated some relationship between a State's reimbursement policy and the out-of-school program conducted. With the exception of one State, the States which had adopted policies making reimbursement for the total program contingent upon the out-of-school program conducted had a higher percentage of the total enrollment in vocational agriculture made up of young farmers and adult farmers than the States reimbursing out-of-school programs separately from the all-day program. Also, the States with policies requiring young farmer and adult farmer instruction as a part of a complete program provided out-of-school classes in a higher percentage of the schools with all-day programs.

3239. WARNER, HILDRED HARVEY. *A Study of the Intellectual Abilities of Freshman Students Enrolled in Vocational Agriculture in Wood County*. Thesis, M.S., 1962, The Ohio State University. 64 p. Library, The Ohio State University, Columbus.

*Purpose.*—To compare the IQ and scholastic achievement of freshman vocational agriculture students with that of their peers.

**Method.**—The data for this study were secured from individual student files in the offices of the principals of the high schools in Wood County, Ohio. These records were of freshman students entering high school in the years 1957 through 1960. Age, IQ rating on the California Short Form Test of Mental Maturity, achievement in agriculture, and achievement in academic subjects were recorded. The study covered 1547 freshmen, including 102 vocational agricultural students.

**Findings.**—The vocational agriculture students were normally distributed on the basis of IQ, which averaged 100.4. The entire freshman student body was normally distributed on the basis of IQ, which also averaged 100.4.

A comparison of student IQ score and academic grades showed that the vocational agriculture students had definitely lower academic grade achievement than expected. A comparison was made between the Wood County vocational agriculture students and their peers in the same academic subjects. The peer students were normal and achieved academically as they were expected to do.

Still another comparison was made to determine how the vocational agriculture students performed in vocational agriculture. It was evident that course grades were generally much higher than would be expected from a normal IQ distribution.

The last objective was to determine if there was a difference in average mental capacity of students enrolled in agriculture before and after the launching of *sputnik* in 1957. The average IQ of the freshman students was not significantly different in any of the 4 years of the study.

**3240. WEIR, WILBUR R.** Employment Opportunities for the Graduates of Vocational Agriculture in Farm Related Occupations in Medina County. Thesis, M. Sc., 1961, The Ohio State University. 65 p. Library, The Ohio State University, Columbus.

**Purpose.**—The primary aim of this study was to determine the job opportunities for the graduates of vocational agriculture in farm-related enterprises in Medina County, Ohio. The secondary objective was to identify the vocational interests of the 1960-61 students of vocational agriculture in Medina County, and the employment status of former students who had pursued a course of vocational agriculture in high school.

**Method.**—The study included 52 farm-related enterprises, 155 students of vocational agriculture in 1960-61, and 286 vocational agriculture students of the 1951-60 classes. The data were collected by means of questionnaires.

**Findings.**—There were 450 full-time male employees in 52 farm-related enterprises in

Medina County. During the years 1951-60, 472 full-time male employees were hired by the 52 farm-related enterprises. For the 5-year period 1961-65, it was estimated there would be 50 job openings per year in the 52 farm-related enterprises due to labor turnover or anticipated expansion.

Three out of five of the 1960-61 students of vocational agriculture had some phase of agriculture as an occupational goal; 31 percent desired to farm full time, and 31 percent desired to become employed in farm-related occupations. Twelve graduates per year were interested in full-time farming, and 12 graduates per year were interested in farm-related occupations as a vocational goal. The ratio of students expected to be interested in farm-related employment and the job openings in farm-related enterprises was approximately 1 to 4. The opportunity for employment was good.

Fifty-six percent of the 1951-60 students of vocational agriculture were engaged in some phase of agriculture at the time of this study. Fifty-seven, or 20 percent, of the 286 former students were farming full time in 1961. Forty-nine, or 17 percent, of the former students were engaged in farm-related occupations at the time of this study.

**3241. WELLER, RUSSELL A.** An Appraisal of Patterns of Scheduling an In-Service Course in Technical Agriculture for Teachers. Thesis, M. Ed., 1963, The Pennsylvania State University. 38 p. Library, The Pennsylvania State University, University Park.

**Purpose.**—To compare the educational effectiveness of three patterns of scheduling a course in Quality Milk Production for teachers of vocational agriculture.

**Method.**—The study involved 43 Pennsylvania vocational agriculture teachers enrolled for a university credit course in Quality Milk Production at three randomly selected, off-campus locations. A different pattern was used to schedule the classes at each location. These were: six 2½ hour classes all within 1 week; six 2½-hour classes at weekly intervals; and six 2½-hour classes at monthly intervals.

All classes were taught by the same teacher of agriculture, who was specially trained in the subject matter of the course and had assisted in preparation of the teaching materials used. Each teacher enrolled was given a copy of an instructor's resource unit and a prepared notebook of related technical information.

The criterion measures were a 60-question multiple-choice test and a checklist of skills. Both measures were administered at the beginning and at the close of the course. Data were obtained on teaching experience, farm experience, and attendance.

**Findings.**—There was a significant gain in the test scores of teachers in all of the patterns of scheduling of classes. The mean gains in test scores were 13.8 for the workshop sequence of all classes held in 1 week, 8.5 for the weekly sequence, and 11.4 for the monthly sequence. A positive relationship was found between percent of classes attended by each teacher and the difference between their pre-test and test scores. Teachers engaged in young adult farmer instruction made higher gains in test scores and attended a larger percentage of the classes. Teachers enrolled for the workshop sequence developed a larger number of the skills included on the checklist.

This study was one part of a larger research project. It showed that a teacher of agriculture with special training was successful with each scheduling sequence. The group for which classes were held weekly had the fewest teachers engaged in young adult farmer work and had lower attendance at two sessions.

3242. WELSH, ROBERT STANLEY. *Factors Contributing to Successful Adult Farmer Programs in Vocational Agriculture in Ohio*. Thesis, M.A., 1962, The Ohio State University. 115 p. Library, The Ohio State University, Columbus.

**Purpose.**—To identify and determine the relative effectiveness of practices used by teachers in conducting successful adult farmer programs of vocational agriculture in Ohio and to recommend practices that may be used to improve adult farmer programs.

**Method.**—The data were secured through mailed opinionnaires returned by 122 adult farmers who were members of 56 successful vocational agriculture adult farmer programs in Ohio. Percentage preference and weighted value ratings were used in presenting the data.

**Findings.**—The farmers generally wanted 15 or more 1½-hour weekly meetings during the months of November, December, January, February, and March. Very few farmers desired meetings during the summer months. An instructional program including a variety of topics with a different topic for each meeting was preferred by the majority of farmers.

Teaching methods found to be particularly desirable for use in adult farmer programs were tours and field trips (two per year); use of visual aids, such as charts, movies, and slides; demonstrations in the classroom and on the farm; group discussions with question-and-answer periods; on-the-farm visitation and instruction by the teacher (three to four visits to each member's farm yearly); and the use of outside speakers and specialists. Outside speakers and specialists were given a high rating as a type of instruction, and the majority of the farmers desired outside

speakers for 50 percent or more of the adult farmer meetings yearly.

Learning of new methods, changes, and trends in farming, and learning timely information that could be used immediately on the farm were the most valuable benefits received from the meetings by the farmers.

3243. WESSMAN, ELWOOD DWIGHT. *Areas of Research Need and Areas of Research Concentration in the Field of Agricultural Education*. Thesis, M.A., 1963, University of Minnesota. 41 p. Department of Agricultural Education, University of Minnesota, Minneapolis.

**Purpose.**—To determine the areas of research concentration in vocational agriculture in the United States and to provide an empirical base for potential researchers to select a topic that would be most meaningful to the agricultural education program in Minnesota.

**Method.**—The author categorized all of the 3,004 previous research studies in vocational agriculture as recorded in *Summaries of Studies in Agricultural Education* (Vocational Division Bulletin No. 180 and its Supplements numbered 1 through 14); these studies were arranged by 33 different selected categories and grouped by 5-year periods. Also, questionnaires were sent to 100 vocational agriculture teachers in the State of Minnesota requesting them to rate a list of 25 categorized areas according to how they felt each was in need of further research.

**Findings.**—The 10 most commonly used areas of research, listed in order of frequency, were courses of studies; administration; measurement and evaluation; followup of graduates and students; supervised farming program; adult education; teacher education; Future Farmers of America; young farmer education; and veterans' program.

The areas found receiving the least amount of previous research study were program of work; research; multiple-teacher departments; objectives; fairs and shows; contests; rural youth; supervision; vocational education; and public relations and promotion.

The agriculture teachers in Minnesota ranked the following problem areas as in most urgent need of further research: Occupational opportunities; adult education; guidance; teaching materials; farm mechanics; courses of study; summer activities; young farmer education; methods of teaching; and teacher education.

In reviewing and categorizing the recorded studies in vocational agriculture, it became evident that previous research studies had not given equal coverage to the problems confronting the vocational agriculture program, and that many important areas had received little attention.

X  
3244. WILLIAMS, WILLIAM. Effectiveness of Three Methods of Teaching Udder Health of Dairy Cows to Young Adult Farmers. Thesis, M. Ed., 1963, The Pennsylvania State University. 42 p. Library, The Pennsylvania State University, University Park.

*Purpose.*—To test three methods of teaching a unit on udder health, especially concerning the reduction of udder irritation due to mastitis. The study demonstrated educational effectiveness of use of the California Mastitis Test, laboratory tests of sensitivity of organisms to selected antibiotics, and a checklist of management practices.

*Method.*—A program of instruction was carried out with groups of young adult farmers in the Millinburg (Pennsylvania) community as follows: Group A attended eight 3-hour class sessions, 4 nights per week for 2 consecutive weeks, of a unit course in Quality Milk Production and had on-farm instruction, including two California Mastitis Tests made on each cow at monthly intervals, use of a management practices checklist, and establishment of a system of herd health records. Group B was treated like Group A except that the men did not attend the classes. Group C farmers attended the classes but did not get the special on-farm instruction program. The Group D dairy farmers were a control group which received only the regular young farmer on-farm visits during the period of this study. Data instruments used were a multiple-choice information test and a checklist of management practices.

*Findings.*—The men who attended the class method of instruction made the highest information test scores. Four farmers in Group A averaged 77.5 percent. Twelve in Group C averaged 75.9 percent. In comparison, six men in Group B averaged 59.2 percent and nine in Group D averaged 56.3 percent. On-farm instruction including tests of each udder by quarters provided diagnostic service but did not result in the farmers' learning the science information involved.

These dairy farmers did not rate many of the management practices high in importance. Incidence of udder irritation was high in the 10 herds tested. Only 18 percent of the cows were clear. Forty percent of the cows had ratings of plus-2 or plus-3 on the California Mastitis Test, partly because the testing was done in January and February. Selective sensitivity to treatment by specific antibiotics showed that dairymen are confronted today with several types of hard-to-control organisms.

3245. WOLF, RAYMOND SIDNEY. A Study of the Use of Radio by Minnesota Vocational Agriculture Teachers. Staff

Study, 1961, University of Minnesota. 17 p. Department of Agricultural Education, University of Minnesota, St. Paul.

*Purpose.*—To learn the extent to which radio, live or taped, is used in vocational agriculture instruction by Minnesota vocational agriculture teachers; and to determine which group of teachers, according to years of teaching experience, made the greatest use of radio.

*Method.*—A 2-page questionnaire was mailed to every vocational agriculture teacher in Minnesota, asking for the extent to which radio was being used and inquiring about the use of special teaching tapes and the use of radio other than for live broadcasting. Two hundred and fifty-nine of the 338 teachers returned the questionnaire.

*Findings.*—Radio programs are conducted by 8.9 percent of the teachers, but only 6.6 percent have programs once or more each month. Seventy-one percent use radio in some form. Of the teachers "doing radio," 22 percent had taught 16 or more years; 56 percent had taught 11 to 15 years; 9 percent had 6 to 10 years of experience; and 13 percent had taught from 3 to 5 years. Fifty-two percent of those conducting radio programs did not have a radio station in the town, whereas 18 percent of the instructors not conducting a program had a station in the high school town.

Forty-six percent of the programs were taped and most of them were of the interview type. A majority of teachers who regularly conducted radio programs had invited stations to cover events, had sent copy to a station, and had used radio in the classroom.

Over half of all instructors, regardless of teaching experience had sent copy to stations. Approximately 30 percent had been guests on a station program, had arranged for students to be on the air, and had used tapes for teaching. About 25 percent had invited a radio station employee to a school event and had used a radio program for class work.

3246. WOLFF, FRANK JOSEPH. A Study of the Organizational and Operational Patterns of Multiple-Teacher Departments of Vocational Agriculture in New Jersey, New York, Ohio and Pennsylvania with Recommendations for the Department at Corning, New York. Thesis, M. S., 1962, Cornell University. 142 p. Library, Cornell University, Ithaca.

*Purpose.*—(1) To determine the patterns used for organizing and operating multiple-teacher vocational agriculture departments in the four-State area; (2) to decide which patterns, if any, could be adapted to the situation in Corning; and (3) to compile a series of recommendations for the Corning department.

**Method.**—An intensive review of pertinent literature was followed by a survey of the multiple-teacher departments in the four States conducted during the fall of 1960. A total response to the survey form of 83 percent was obtained. The data accumulated from the responses of 70 of the departments were used in the report.

**Findings.**—The typical multiple-teacher department had two instructors and had been operating in the multiple-teacher status only about 7 years. One of the teachers, usually the one with the greater number of years of experience, served as head of the department. This was usually a permanent appointment. The most important factor causing the second teacher to be added to the staff had been the increased enrollments and/or the increased teaching load.

Teaching and other responsibilities were divided so that insofar as possible each teacher participated in all phases of the department program. In the majority of the schools neither teacher had any teaching responsibilities for courses outside the field of agriculture. Each instructor made farm visits to the students in his own classes, and each student had the opportunity to take courses from both instructors sometime during his 3 or 4 years of vocational agriculture training.

The "typical" department offered Vocational Agriculture I, II, III, and IV, although all courses were not necessarily offered each year. Agriculture III and IV were sometimes offered in alternate years. The department also offered an organized program for either young farmers or adult farmers and rarely for both groups in separate classes. Non-vocational-agriculture courses generally were not offered.

Enrollments in Vocational Agriculture I, II, III, and IV averaged about 20, 14, 12, and 12, respectively; the average total enrollment of all-day students in grades 9 through 12 was about 58.

The majority of the school systems studied did not provide separate buildings for junior and senior high school students. The department usually had the use of one classroom and one shop and also was provided with an inside or an outside storage and/or materials room or building.

**3247. YOUNG, DAVID B.** Employment Opportunities and Training Requirements in Agricultural Occupations in Toledo, Ohio, and Surrounding Area. Thesis, M.A., 1962, The Ohio State University. 163 p. Library, The Ohio State University, Columbus.

**Purpose.**—To ascertain the number of employment opportunities and the training requirements of employees in Toledo area agricultural businesses.

**Method.**—The city of Toledo, Ohio, and the area surrounding within a 20-mile radius was selected as the region for the study. The companies to which the questionnaire was mailed were selected from telephone directories.

**Findings.**—Of the 120 persons in agricultural businesses who responded, 87 percent had a direct responsibility for the employment of personnel.

Nearly all of the businesses surveyed were engaged in sales. Approximately 50 percent of the businesses were engaged in manufacturing and/or production, and another 50 percent were dealing in services.

Agricultural businesses included in the study employed a total of 3,311 persons. These businesses replaced 447 persons annually. The greatest number replaced were unskilled laborers and sales personnel in food processing plants, landscaping firms, and greenhouses.

Employers reported the greatest difficulty in recruiting persons for skilled technical and sales positions in all businesses. Landscaping firms experienced the greatest overall difficulty.

A high school education was required by approximately two-thirds of the employers for all except skilled technical and administrative positions. Nearly 60 percent of the employers required study beyond high school for these positions.

Employers considered on-the-job training the most important for all of the positions except administration and public relations. FFA activities were thought to be the most beneficial for administrators and farm work experience for public relations personnel.

On-the-job training was considered the most valuable for employees in landscaping, farm equipment, feed, grain and supply, greenhouse, chemical, and grain-elevator businesses. The activities of the FFA were rated the most important for the remaining businesses except for greenhouses, where farm mechanics were considered to be of greatest value.

**3248. ZARRAGA, JOSE CRUZ.** The Development and Experimental Trial of Programmed Learning Material in Teaching Farm Business Management to Vocational Agriculture Students. Dissertation, Ph. D., 1963, University of Minnesota. 129 p. Library, University of Minnesota, Minneapolis.

**Purpose.**—To develop and test two types of programmed instruction material in farm business management in teaching senior high school vocational agriculture students and to evaluate the effectiveness of review examinations incorporated at the end of each unit of the programmed text materials.

**Method.**—Two types of programmed instruction material were developed. The branching

program format was similar to a Crowder scrambled book. In the nonbranching program format the units of information were presented in a form similar to that of a conventional textbook. The review examinations were used in all cases except for one group using the branching program. The programed material was titled *Is Optimum Production a Problem on Your Farm?*

The programed instruction material was revised and reorganized three times with the help of staff members of the University of Minnesota and the instructors and high school students of vocational agriculture at Forest Lake, Minnesota.

The effectiveness of the material was evaluated in experimental trials. The sample for the study consisted of 11th and 12th grade high school students in five Minnesota vocational agriculture departments. All students in each school were randomly assigned into two groups. The students were given 10 classroom hours of programed instruction. The teachers of each vocational agriculture de-

partment were responsible for supervising the instruction and administering the tests.

The data collected and treated were from four sources: (1) Raw scores on the pretest; (2) raw scores on the posttest; (3) Lorge-Thorndike Intelligence Test scores; and (4) Iowa Test of Educational Development (Reading Social Science) percentile ranks.

*Findings and Interpretations.*—Learning had taken place in all the experimental trials. The branching program with review examinations showed a slight advantage in respect to mean gains on the scores over the branching program without review examinations. The statistical result, however, showed no significant difference between the treatments. The branching program with review examinations was superior to the nonbranching program with review examinations. The correlation analysis results showed that programed instruction was equally effective for all ranges of student ability. No significant change in variance from pretest to posttest scores occurred.

## Classified Index of Studies

### ADMINISTRATION

Facilities, 3123, 3203, 3227  
Organization, 3150, 3246  
Personnel, 3112, 3113, 3163, 3165,  
3226  
Policies, 3238  
Programs—college, 3156, 3178, 3224  
Programs—other nations, 3105, 3134  
Programs—secondary, 3117, 3153,  
3170, 3172, 3204, 3218, 3229  
Public relations, 3127, 3202, 3245  
Research, 3243  
Role perception, 3119, 3136, 3185,  
3211, 3233

### GUIDANCE:

Activities, 3130, 3146, 3230  
Occupational choice, 3106, 3189, 3210  
Occupational opportunities, 3205,  
3231, 3236, 3240, 3247  
Occupational placement, 3116, 3125,  
3157, 3169, 3176, 3194, 3217, 3221  
Occupational requirements, 3124,  
3129, 3133, 3199, 3207, 3225, 3237  
Prediction—college, 3109, 3110, 3111,  
3114, 3141, 3148, 3159, 3161, 3174,  
3187, 3188, 3201, 3215, 3216, 3228  
Student selection, 3115, 3135, 3180,  
3190, 3192, 3234, 3239

### INSTRUCTION:

Adult and young farmer classes,  
3120, 3122, 3126, 3142, 3154, 3164,  
3182, 3208, 3219, 3242  
Courses of study, 3147, 3173  
Future Farmers of America, 3128,  
3162, 3177, 3181, 3183, 3209  
High school classes, 3145, 3152, 3175,  
3186, 3222, 3223, 3235  
Placement for occupational experi-  
ence, 3160, 3200  
Procedures—mechanization, 3140,  
3184, 3195, 3214  
Procedures—production and manage-  
ment, 3107, 3108, 3137, 3139, 3191,  
3198, 3220, 3232, 3244  
Resource units, 3121, 3132, 3138, 3179,  
3196, 3213, 3248  
Supervised farming experience, 3144,  
3166, 3197

### TEACHER EDUCATION:

Curriculums, 3143, 3167  
Placement, 3131  
Programs—inservice, 3155, 3171, 3241  
Programs—preservice, 3118, 3151,  
3193, 3212  
Student teaching, 3149, 3158, 3168,  
3206