DOCUMENT RESUME

ED 036 647 VT 010 398

AUTHOR BERKEY, ARTHUR L.; AND OTHERS
TITLE THE RELEVANCE OF SECONDARY OCCUPATIONAL TRAINING IN AGRICULTURE TO OCCUPATIONAL PATTERNS AND IMAGES. FINAL REPORT.
INSTITUTION CORNELL UNIV., ITHACA, N.Y.
SPONS AGENCY NEW YORK STATE EDUCATION DEPT., ALBANY. BUREAU OF OCCUPATIONAL EDUCATION RESEARCH
PUB DATE JUN 69
NOTE 88P.

EDRS PRICE EDRS PRICE MF-$0.50 HC-$4.50
DESCRIPTORS CAREER CHOICE, EMPLOYEE ATTITUDES, EMPLOYER ATTITUDES, *GRADUATE SURVEYS, JOB SATISFACTION, OCCUPATIONAL CHOICE, ON THE JOB TRAINING, *PROGRAM EVALUATION, *RELEVANCE (EDUCATION), SECONDARY GRADES, *VOCATIONAL AGRICULTURE, *VOCATIONAL FOLLOWUP
IDENTIFIERS NEW YORK STATE

ABSTRACT

TO GATHER OCCUPATIONAL FOLLOW-UP DATA FROM SECONDARY AGRICULTURAL GRADUATES AND THEIR EMPLOYERS AS A BASIS FOR EVALUATION OF OCCUPATIONAL EDUCATION PROGRAMS AND TO DEVELOP A PROCEDURAL FOLLOW-UP MODEL, SELF-ADMINISTERED QUESTIONNAIRES WERE OBTAINED FROM 430 GRADUATES AND 126 EMPLOYERS TO ASCERTAIN OCCUPATIONAL STATUS, RELEVANCE OF TRAINING, AGRICULTURAL IMAGES, AND JOB SATISFACTION. RESPONDENTS WERE 1968 NEW YORK STATE SECONDARY AGRICULTURAL GRADUATES WHO HAD COMPLETED 2 YEARS OF FARM PRODUCTION AND MANAGEMENT, CONSERVATION, AGRICULTURAL MECHANIZATION, OR ORNAMENTAL HORTICULTURE, AND THEIR EMPLOYERS. SOME FINDINGS WERE: (1) 41 PERCENT OF GRADUATES WERE QUICKLY EMPLOYED, 30 PERCENT ENTERED COLLEGE, 1 PERCENT TOOK OTHER POST SECONDARY TRAINING, 27 PERCENT ENTERED MILITARY SERVICE, 1 PERCENT WERE UNEMPLOYED, (2) 53 PERCENT OF EMPLOYED GRADUATES WORKED IN THE AREA FOR WHICH THEY WERE TRAINED (THE RANGE WAS 63 PERCENT FOR FARM PRODUCTION AND MANAGEMENT GRADUATES TO 30 PERCENT FOR GRADUATES OF SOME OF THE OTHER AREAS), (3) GRADUATES FOUND FIRST-YEAR EMPLOYMENT PRIMARILY THROUGH USE OF INFORMAL JOB-SEEK METHODS, (4) GRADUATES RECEIVED ADEQUATE TRAINING FOR THE AGRICULTURAL KNOWLEDGES AND ABILITIES NEEDED IN THEIR JOBS, AND (5) MOST GRADUATES HAD A POSITIVE IMAGE OF FARMING AND A SLIGHTLY HIGHER POSITIVE IMAGE OF OFF-FARM RELATED AGRICULTURAL INDUSTRY. (DM)

Research Coordinating Unit

Final Report

The Relevance of Secondary Occupational Training in Agriculture to Occupational Patterns

CORNELL UNIVERSITY
ITHACA, NEW YORK

in cooperation with

The University of the State of New York
THE STATE EDUCATION DEPARTMENT
Bureau of Occupational Education Research
Albany, New York 12224

THE RELEVANCE OF SECONDARY OCCUPATIONAL TRAINING IN AGRICULTURE TO OCCUPATIONAL PATTERNS AND IMAGES

Contract No. C - 32242

by

Arthur L. Berkey,

William H. Kelly

and

David W. Brown

Cornell University, Ithaca, New York

in cooperation with

The University of the State of New York
THE STATE EDUCATION DEPARTMENT
Bureau of Occupational Education Research

June, 1969

THE UNIVERSITY OF THE STATE OF NEW YORK

Regents of the University

(with years when terms expire)

1984	Joseph W. McGovern, A.B., LL.B., L.H.D., LL.D., D.C.L., Chancellor	New York
1970	Everett J. Penny, B.C.S., D.C.S., Vice Chancellor	White Plains
1978	Alexander J. Allan, Jr., LL.D., Litt.D.	Troy
1973	Charles W. Millard, Jr., A.B., LL.D., L.H.D.	Buffalo
1972	Carl H. Pforzheimer, Jr., A.B., M.B.A., D.C.S., H.H.D.	Purchase
1975	Edward M. M. Warburg, B.S., L.H.D.	New York
1977	Joseph T. King, LL.B.	Queens
1974	Joseph C. Indelicato, M.D.	Brooklyn
1976	Mrs. Helen B. Power, A.B., Litt.D., L.H.D.	Rochester
1979	Francis W. McGinley, B.S., LL.B., LL.D.	Glens Falls
1980	Max J. Rubin, LL.B., L.H.D.	New York
1971	Kenneth B. Clark, A.B., M.S., Ph.D., Litt.D.	Hastings on Hudson
1982	Stephen K. Bailey, A.B., B.A., M.A., Ph.D., LL.D.	Syracuse
1983	Harold E. Newcomb, B.A.	Owego
1981	Theodore M. Black, A.B.	Sands Point

President of the University and Commissioner of Education (Acting)
Ewald B. Nyquist

Associate Commissioner for Elementary, Secondary and Continuing Education
Walter Crewson

Associate Commissioner for Research and Evaluation
Lorne H. Woollatt

Assistant Commissioner for Research and Evaluation
William D. Firman

Assistant Commissioner for Occupational Education
Robert S. Seckendorf

Director, Division of Research
Carl E. Wedekind

Chief, Bureau of Occupational Education Research
Louis A. Cohen

FOREWORD

The Vocational Education Act of 1963 has had a profound effect on all areas of vocational-occupational education. The area of agricultural education has been actively stimulated through its mandates and support. This study was a timely undertaking in respect to the evaluation of secondary agricultural education programs.

This follow up study has generated a procedural model for similar future investigations. Identified also are related areas where research is needed, as well as supplying supportive evidence for suggested improvements within the existing agricultural programs.

Miss G. Geraldine Dickson, Associate in Education Research, coordinated this document for publication.

It should be noted that the appendices containing the specific instruments administered, denoted in the text by appendix references, have been deleted from this printing. Educators wishing these additional items should contact the Bureau of Occupational Education Research, State Education Department, Albany, New York 12224. Loan copies are available upon request.

Carl E. Wedekind
Director, Division of Research

TABLE OF CONTENTS

* See Foreword, p. iii.

ACKNOWLEDGMENTS

This study was funded by the Bureau of Occupational Education Research, New York State Education Department, University of the State of New York.

The authors wish to express appreciation to the following individuals for their contributions:

State Education Department Personnel

Dr. Harold L. Noakes, Chief, Bureau of Agricultural Education, for his contributions in planning the study and providing the list of schools offering occupational education in agriculture.

Miss G. Geraldine Dickson, Associate in Research, Bureau of Occupational Education Research, for her suggestions and assistance in planning and conducting the study, and for suggesting improvements in this report.

Local School District Personnel

The authors wish to thank the school administrators, guidance personnel, and teachers of agriculture for their cooperation and assistance in providing the lists of graduates, and in follow up.

Graduates and Employers

Special thanks are due to the 1968 secondary agricultural graduates and their employers for cooperation in providing the data for the study.

Cornell University Personnel

Mr. Victor Bellard, graduate student in Agricultural Education, for his assistance in compiling lists and mailing out and coding questionnaires.

Mr. N. Ethirveerasingham, graduate student in Agricultural Education, for his assistance in mailing out and coding of questionnaires.

Mrs. Marilyn J. Schnell, Research Associate in Rural Sociology for her counsel and cooperation in computer analysis.

Miss Betty Reding for her secretarial work.

LIST OF TABLES

INTRODUCTION

Importance of the Study

Background of the Problem

Passage of the Vocational Act of 1963 broadened the responsibility of agricultural education to provide training for entry into off-farm agricultural occupations as well as farming. To meet the challenge of this new responsibility, development of broad new programs in agricultural education was needed.

An important part of the occupational education programs in agriculture developed in New York is the programs offered in the Area Occupational Centers. These centers serve students in several school districts and are administered by Boards of Cooperative Educational Services (BOCES). Development of Area Occupational Centers in New York began in 1964-65, and Noakes[1] projected that by the end of 1967-68 agricultural programs in the Area Centers will be available to all areas of the State.

Five occupational education programs in agriculture are offered to 11th and 12th grade students in the Area Centers: Agricultural Business, Agricultural Mechanization, Conservation, Farm Production and Management, and Ornamental Horticulture. In the 1967-68 school year enrollment in the five areas was as follows:

---

[1]Noakes, Harold L. "Status of Agricultural Education in New York State," The Empire State Vo-Ag Teacher, October 1967. Vol. 7, No. 1, p. 3.

	Number of Students Grades 11 - 12
Agricultural Business	259
Agricultural Mechanization	762
Conservation	540
Farm Production and Management	2,800
Ornamental Horticulture	364

The Problem

How relevant to their occupational status was the agricultural education received by 1968 New York State secondary graduates? What was the extent of the job satisfaction for the graduates who were employed and what is the relationship between job satisfaction and their image of agriculture? Research is needed to provide the data to answer these questions, and serve as a possible basis for evaluation and improvement of occupational education programs in agriculture.

Related Literature

The report of the Panel of Consultants on Vocational Education[2] points out that placement studies should not be the only criteria for evaluation in agricultural education. The Panel stressed the need for improvement in obtaining follow up data to be used in evaluation.

According to Venn,[3] there is a broadening direct relationship

---

[2]U.S. Department of Health, Education, and Welfare, Office of Education, Education for a Changing World of Work - Report of the Panel of Consultants on Vocational Education, 1964 U.S. Government Printing Office, Washington, D.C. 20402, OE-80021. pp. 92, 207.

[3]Venn, Grant, Assisted by Theodore J. Marchese, Jr., Man, Education, and Work, Postsecondary Vocational and Technical Education, 1964, by the American Council on Education, 1785 Massachusetts Avenue, N.W., Washington 36, D.C. pp. 147, 150, 172.

between education and occupation. Venn points out the need for education to establish a firm and continuing relationship between students, programs, and the world of work, and that follow up is partially the basis for this relationship. He further recommends that periodic follow up become an established function and serve as a basis for evaluation.

The High School Youth Committee of the National Seminar in Evaluation and Program Planning in Agricultural Education[4] points out the need for a planned and organized system of student follow up to provide information for evaluation.

The use of follow up data in planning and revising the curriculum is included as part of the agricultural education program evaluation at North Carolina.[5]

The Advisory Council on Vocational Education[6] identified the evaluation of the effectiveness of existing training programs as a critical issue to be faced. Further, it recommended that the Vocational Act of 1963 provide that the states conduct periodic statewide review and evaluation of their vocational education programs. The Council also

---

[4]The Center for Vocational and Technical Education, "Evaluation and Program Planning in Agricultural Education," A Report of a National Seminar June 27-30, 1966, Ohio State University, 980 Kinnear Road, Columbus, Ohio 43212. pp. 116-117.

[5]Division of Vocational Education, Agricultural Education Section of the North Carolina Department of Public Instruction, "Agricultural Education Program Evaluation," February 1967, Raleigh, North Carolina. p.15.

[6]Vocational Education - The Bridge Between Man and His Work, Summary and Recommendations Adapted From the General Report of the Advisory Council on Vocational Education. American Vocational Association, 1025 15th Street, N.W., Washington, D.C. 20005, 1968. pp. 10,14.

recommended that the responsibility of education to follow up students be included in an expanded definition of vocational education.

Purpose

The purpose of this study is to provide a basis for the evaluation of secondary occupational education programs in agriculture in New York State through a follow up survey of graduates and their employers.

Objectives

The objectives of this study are to determine:

1. The present occupational status of graduates.
2. The types of employment selected by graduates.
3. The occupational promotions received by graduates.
4. The type and extent of any additional training received by the graduate while employed.
5. The in-school training received by graduates.
6. The need for the training received in graduates' first year employment as perceived by the graduates and their employers.
7. The adequacy of the training received, which is needed in the graduates' first year employment, as perceived by the graduates and their employers.
8. The reasons why graduates may not have entered the agricultural occupation for which they received training.
9. The graduates' satisfaction with present occupational status.
10. Graduates' plans for future employment.
11. The image of agriculture as perceived by graduates.

Secondary Objective

To develop a model for follow up studies of secondary graduates of occupational education in agriculture, which may be adopted for use in other occupational education areas.

Assumptions

1. Graduates of occupational education in agriculture and their employers are interested in the occupational education program in agriculture and will be willing to furnish the information and opinions requested.

2. The responses and opinions of the graduates and their employers will be valid data for evaluating the present program of occupational education in agriculture, and will suggest improvements that can be made in that program and provide information helpful for planning new programs of occupational education in agriculture.

3. The ability of the graduate and his employer to evaluate the adequacy of the graduates' occupational education in agriculture is limited to the knowledges and abilities needed in the job by the graduate.

4. The graduate and his employer can distinguish between the training received in occupational education and agriculture and the training received on the job the first year.

Operational Definitions

Employers

Management representatives in business establishments reported by graduates as the firm in which they were employed.

Graduates

Persons graduating from New York State secondary schools in 1968 who earned four units of credit in occupational agriculture by completing 2 units in the same specialized agriculture area (i.e. farm production and management, conservation, agricultural mechanization, ornamental horticulture) in both their junior and senior years.

Image

The sum total of an individual's knowledge and beliefs about a referent (i.e. objects, organizations, people, conditions, events, and/or concepts) as measured by the 14 items on the image instrument.

Job Satisfaction

Attitudes (feelings) which an individual has toward his job, as measured by the 5 items on the job satisfaction instrument.

Specialized Area of Agriculture

The areas of farm production and management, conservation, agricultural mechanization, and ornamental horticulture for which secondary occupational education in agriculture is provided in New York State schools.

METHODOLOGY

Sample

The population of the study is graduates who completed four units of secondary level occupational education in agriculture at the junior and senior level in New York State in 1968 in one of the specialized areas of agricultural mechanics, ornamental horticulture, conservation, or farm production and management; and their employers. Agricultural business was excluded from the population due to the limited number of graduates.

The sample for the study is the entire population of graduates and their employers. The entire population was used to provide an employer sample of sufficient size (it was anticipated from the results of similar studies that less than 50 percent of graduates would be employed and that the percent return of questionnaires from both graduates and employers would be 50 to 60 percent).

CONSTRUCTION OF INSTRUMENTS

Instruments to gather the data to meet the objectives of the study were constructed. Many suggestions and ideas for formulating items in the instruments were obtained from a review of the related literature. The instruments were pre-coded to allow coding of responses directly on the instrument, and keypunching of data on IBM computer cards directly from the instruments. Pretesting was carried out to provide reliability and validity. The instruments used in this study are included as Appendices C and D.

The specific procedures used in development of the items to measure occupational status, image, job satisfaction, and the need for and adequacy of knowledges and abilities are presented below.

Occupational Status

The 8 categories (question No. 6 in Appendix C-2) used in the New York State Basic Education Data System (BEDS) were selected for use as occupational status categories in this study. The use of BEDS categories was intended to provide opportunities for comparison of the data from this study with data on non-vocational students. Also, as secondary school administrators and guidance personnel are currently reporting into BEDS, this provides the possibility of individual school comparisons.

Image Scale

An instrument to measure image of agriculture (i.e. Farming and Non-Farm Related Agricultural Industry) was not found to be available in the literature. The image instrument for this study was constructed using the following procedure:

1. A list of 90 short structured statements which represent favorable or unfavorable knowledge of beliefs about agriculture was

compiled. Many suggestions and ideas for formulating statements were obtained from the review of related literature.

2. The list of statements was screened to eliminate duplication, provide items representative of an area of knowledge clearly different from any other item, and have general application to the population of the study. Fourteen items were selected for inclusion in the image scale. Six of the selected items were negative and eight were positive.

3. A 3 point agreement scale of "agree," "neutral," and "disagree," was devised for use by graduates in rating the image statements (questions No. 4 and 5, Appendix C-1). The 3 points of the scale were arbitrarily assigned the values of 3, 2, and 1 respectively for positive image statements; and 1, 2, and 3 respectively for negative image statements.

Job Satisfaction

The five descriminably different areas of job satisfaction identified by Hulin[7] were chosen based on the selection of criteria of low verbal level, simplicity for a self-administered questionnaire, representative areas different from other areas, and general application to most jobs. These areas were (1) the people worked with, (2) the supervision received, (3) the work done, (4) promotions available in the job, and (5) the pay received.

A 5 point satisfaction scale (Appendix C-1) was used for graduates to rate each of the 5 job satisfaction areas. Numerical values of 1-5 were arbitrarily assigned to the 5 point scale (satisfied was rated "5" and dissatisfied was rated "1").

---

[7]Hulin, C. L. et.al., "Cornell Studies of Job Satisfaction, II, Model and Method of Measuring Job Satisfaction." Research Study conducted at Cornell University, Ithaca, New York, 1966. (In press.)

List of Knowledge and Abilities

A representative list of knowledges and abilities was constructed for each of the four specialized areas of agriculture included in the study. The New York State Education Department course of study guide[8, 9, 10, 11] in each specialized area of agriculture was synthesized to develop a comprehensive list of short, easily read statements (Appendices C-2 to C-5). The same list of knowledges or abilities was used for both graduates and employers.

Ratings of Knowledges or Abilities

Graduate Ratings - The following scales were devised for rating of knowledges or abilities by employed graduates for their present jobs:

1. Training received - "Yes," or "No."
2. Need for training - "E" (Essential), "D" (Desirable) or "U" (Unnecessary). The values of 1, 2, and 3 were arbitrarily assigned to the three responses respectively.

---

[8]The University of the State of New York, State Education Department, Bureau of Secondary Curriculum Development, Conservation, A Guide for Planning and Organizing Occupational Programs, 1968.

[9]The University of the State of New York, State Education Department, Bureau of Secondary Curriculum Development, Farm Production and Management, A Guide for Planning and Organizing Occupational Programs, 1969.

[10]The University of the State of New York, State Education Department, Bureau of Secondary Curriculum Devleopment, Ornamental Horticulture, A Guide for Planning and Organizing Occupational Programs, 1968.

[11]The University of the State of New York, State Education Department, Bureau of Agricultural Education, "A Guide for Developing a Course of Study for Agricultural Mechanization 3 & 4," June, 1965. (Mimeographed)

3. Adequacy of training - "S" (Superior), "A" (Adequate), "I" (Inadequate), and "DNA" (Does Not Apply). The values of 1, 2, 3, and 4 were arbitrarily assigned to the 4 responses respectively.

Employer Ratings - The same rating scales and assigned values for "need" and "adequacy" of training were used for both graduates and employers. The scale on "training received" was not used for employers.

PRETESTING OF INSTRUMENTS

Instruments were pretested with a small group of graduates in each of the 4 specialized areas of agriculture to identify any unclear words, statements, and/or instructions for completing the instruments. Personal interviews were held with each graduate taking part in the pretest.

The instruments were revised to facilitate understanding, as indicated by the results of the pretest. Graduates who participated in the pretest were excluded from the sample.

Instruments were then typed in final form and mimeographed.

Data Collection

The data for the study was collected from graduates and their employers through the use of self-administered mail questionnaires during January - March, 1969.

Procedures

The basic steps used in data collection are described below.

1. The New York State Education Department Basic Education Data System (BEDS) was used to provide the names of secondary schools offering courses in occupational agriculture. Information regarding type of course, enrollment, and name of school administrator and agricultural teacher were also obtained.

2. The schools identified in (1) above were contacted to provide the names, addresses, and occupational status (if known) of graduates in the sample. To increase the percent of returns, schools were also requested to provide a signed letter on school letterhead for introduction of the study to their students.

Limiting graduates in the study to those that completed two units of the same specialized area of Agriculture in both the Junior and Senior years considerably reduced the number of graduates included in the sample. This was especially true in areas other than Farm Production and Management.

3. Precoded questionnaires for preliminary information identified graduates, schools, and specialized area of training.

4. The self-administered type questionnaires were mailed to graduates during January and February 1969. Graduates, reported by schools to be in military service, were not sent questionnaires due to their temporary and overseas residence.

5. Two follow up letters were sent to graduates who did not respond within a 14-day period. Names of graduates not responding to follow up were sent to home schools for personal follow up by school personnel.

6. Self-administered type questionnaires were mailed to employers (as reported by employed graduates) during February and March, 1969. As many as three letters were used to follow up employers not returning questionnaires.

Percentage Return

The number and percent of instruments returned by respondents in the study is presented in Table 1.

TABLE 1

Number and Percent of Questionnaires Returned by Graduates and Employers by Specialized Area of Training

	Number of Persons								Total All Areas	
	FPM		CONS		AG MECH		ORN HORT			
	Graduates	Employers	Graduates	Employers	Graduates	Employers	Graduates	Employers	Graduates	Employers
No. Receiving Questionnaires	444	128	72	28	112	39	49	18	677	214
No. Returning Questionnaires	294	80	41	14	61	22	34	10	430	126
Percent Return	66.2	62.5	56.9	48.3	54.5	56.4	69.4	55.6	63.5	58.9

FPM - Farm Production and Management; CONS - Conservation; AG MECH - Agricultural Mechanization; ORN HORT - Ornamental Horticulture

Analysis of the Data

The study data was analyzed through these steps:

1. The responses from graduates and employers were coded on the questionnaires and then keypunched on IBM 80-column computer cards. Cards were sorted for analysis.

2. The data was summarized as to marginal frequencies, percentages, and means, using Cornell University computer facilities.

Summarized graduate data of occupational status, time to obtain first full-time job, and wages received, was provided to the Bureau of Agricultural Education of the New York State Education Department.

3. To determine the relationship between the employed graduates' image of agriculture (farming, and off-farm related agricultural industry) and job satisfaction, a Pearson product-moment correlation was run, using the Correlation Analysis Program at Cornell University computer facilities.

4. Summary tables to present the data were constructed.

5. Findings were identified and listed.

FINDINGS

Occupational Status of Graduates

The first year occupational status of graduates responding in the study is presented in Table 2. The important findings in occupational status are:

1. Forty-one percent of all agricultural graduates were employed.

2. The percent of Agricultural Mechanization graduates employed was somewhat higher than for the other three areas. However, as the reader will see later, a large percent were employed in farming.

3. Twenty-seven percent of all agricultural graduates were in military service.

4. The percent of conservation graduates in military service was considerably higher than for the other three areas, which were approximately equal to each other.

5. The number of graduates attending college ranged from 12 percent for conservation to 37 percent in farm production and management.

6. Almost all the graduates going on to college did so at the 2-year college level. Only a maximum of 4 percent went on to other types of post high school training.

7. A very low percent of graduates were unemployed.

TABLE 2

First Year Occupational Status of 1968 New York State Secondary Agricultural Graduates by Specialized Area of Training

Occupational Status	Percent of Graduates				Total All Areas (N=569)
	FPM (N=370)	CONS (N=69)	AG MECH (N=85)	ORN HORT (N=45)	
					percent
Employed full or part-time and not attending any post high school or college or training more than half-time.	38	44	53	40	41
In military service*	24	44	30	30	27
Four year college in New York State	4	0	0	0	3
Two year college in New York State	27	7	13	20	22
Other post high school training in New York State	2	4	4	2	3
Four year college outside New York State	2	0	0	0	1
Two year college outside New York State	1	0	0	1	1
Other post high school training outside New York State	1	0	0	2	1
Unemployed	1	1	0	5	1
Total Percent	100	100	100	100	100

*Includes graduates not sent questionnaires but who were reported by schools to be in military service.

FPM - Farm Production and Management; CONS - Conservation; AG MECH - Agricultural Mechanization; ORN HORT - Ornamental Horticulture

Future Occupational Plans

The future occupational plans of graduates are presented in Table 3. The important relationships are:

1. The percent of graduates who listed future employment plans of either "farming", "off-farm related agricultural industry", or "further education related to agriculture" ranged from 71 percent for farm production and management graduates to 48 percent for graduates in conservation.

2. The percent of graduates who planned to enter "non-agricultural industry" ranged from 13 percent reported by farm production and management graduates to 23 percent for agricultural mechanization graduates.

3. Only 10 to 17 percent of graduates reported "uncertain" future employment plans.

TABLE 3

What Were the Future Occupational Plans of 1968 New York State Secondary Agricultural Graduates?

Future Plans	Percent of Graduates			
	FPM (N=266)	CONS (N=36)	AG MECH (N=53)	ORN HORT (N=29)
Farming	43	6	32	7
Off-farm related agricultural industry	21	36	21	49
Non-agriculture industry	13	22	23	14
Further education related to agriculture	7	6	2	7
Further education not related to agriculture	2	3	2	3
Service	4	11	6	3
Uncertain	10	16	14	17
Total Percent	100	100	100	100

FPM - Farm Production and Management; CONS - Conservation; AG MECH - Agricultural Mechanization; and ORN HORT - Ornamental Horticulture

Employed Graduates

Method of Obtaining Employment

Table 4 presents the methods used by graduates in obtaining their first full-time employment. The methods most used were "through a friend or relative", "Personnel office," and "other." The graduates' comments on the questionnaires (Appendix C-1, question No. 21) showed "self employment" and "continuing work on a part-time job held prior to graduation" to be the two principal reasons for a high percent of graduates responding in the "other" category.

TABLE 4

Method Used by Employed* 1968 New York State Secondary Agricultural Graduates to Obtain First Full-Time Job after Graduation

Method	Percent of Employed Graduates			
	FPM (N=131)	CONS (N=27)	AG MECH (N=38)	ORN HORT (N=18)
Through the school	5	15	5	11
Through a friend or relative	31	37	39	17
Personnel office	16	33	14	33
U.S. or State Employment Service	2	11	0	0
Private Employment Service	2	0	0	0
Heard about it on radio or television	0	0	0	0
Through a newspaper ad	1	0	5	0
Other	43	4	37	39
Total Percent	100	100	100	100

*Of the total graduates responding 41 percent were employed, 1 percent were unemployed, 32 percent were receiving further education, and 27 percent were in military service.

FPM - Farm Production and Management; CONS - Conservation; AG MECH - Agricultural Mechanization; and ORN HORT - Ornamental Horticulture

Time Required to Obtain First Full-Time Job

Table 5 presents the time required by graduates to obtain their first full-time job after graduation. The significant findings are:

1. Farm Production and Management graduates found jobs in the least time. This may reflect self-employment to some extent.

2. Graduates of Ornamental Horticulture had a considerably higher percent (12.1%) of graduates in "five or more weeks" category. However, because of the small number of cases in ornamental horticulture (N=15) this finding is limited in value.

3. Over 70 percent of all graduates were employed within "one week or less."

It should be noted that the "one week or less" category includes graduates continuing part-time jobs held prior to graduation.

TABLE 5

Time Required by Employed* 1968 New York State Secondary Agricultural Graduates to Obtain First Full-Time Job by Specialized Area of Training

Time (in weeks)	Percent of Employed Graduates				Total All Areas
	FPM (N=120)	CONS (N=27)	AG MECH (N=37)	ORN HORT (N=15)	
					Percent
One week or less	75.9	58.6	65.8	58.8	70.5
Two	5.3	10.3	13.2	5.9	7.4
Three	3.0	6.9	2.6	5.9	3.7
Four	4.5	6.9	5.2	0.0	4.6
Five or more	11.3	17.3	13.2	29.4	13.8
Total Percent	100.0	100.0	100.0	100.0	100.0

*Of the total graduates responding 41 percent were employed, 1 percent were unemployed, 32 percent were receiving further education, and 27 percent were in military service.

FPM - Farm Production and Management; CONS - Conservation; AG MECH - Agricultural Mechanization; ORN HORT - Ornamental Horticulture

Type of Employment

Employment in Specialized Area of Training - Tables 6 and 7 present the percent of graduates working in the area of specialization in which they received training, and the reasons graduates were not employed in the area of specialization for which training was received. The significant findings are:

1. Over half of all employed graduates were working in their area of specialized training.

2. Sixty-four percent of employed Farm Production and Management graduates were employed in farming. Of those that were not,only 20 percent were not because no job was available. Forty-seven percent were employed at jobs other than farming because they liked the non-farm job better (27%), or the non-farm paid more (20%).

3. Seventy percent of the employed Conservation graduates were employed in jobs not related to their training. Of the total Conservation graduates who were employed, 42 percent (60% x 70%) were unable to find jobs in Conservation.

4. Sixty percent of Agricultural Mechanization graduates were employed in jobs not related to their specialized training. But for a different reason than Conservation students; either they liked the job better, or the job paid more. This may be explained in part by the fact that 46 percent of the employed Agricultural Mechanization graduates were employed in farming.

TABLE 6

Were the Employed* 1968 New York State Secondary Agricultural Graduates Working in Their Area of Specialized Training?

Employment Status	Percent of Employed Graduates				Total All Areas (N=217)
	FPM (N=129)	CONS (N=30)	AG MECH (N=40)	ORN HORT (N=18)	
					Percent
Employed in specialized area	64	30	40	33	53
Not employed in specialized area	36	70	60	67	47
Total Percent	100	100	100	100	100

TABLE 7

Why Were 47 Percent of the Employed* 1968 New York State Secondary Agricultural Graduates Not Working in Area of Specialized Training?

Reasons	Percent of Employed Graduates**				Total All Areas (N=98)
	FPM (N=45)	CONS (N=20)	AG MECH (N=23)	ORN HORT (N=10)	
					Percent
No job available in area trained for	20	60	18	10	27
Decided they liked other job better	27	10	22	20	21
Other job paid more	20	5	20	10	18
Other	33	25	30	60	34
Total Percent	100	100	100	100	100

*Of the total graduates responding 41 percent were employed, 1 percent were unemployed, 32 percent were receiving further education, and 27 percent were in military service.

**Refers only to the graduates not employed in area of specialized training from Table 6

FPM - Farm Production and Management; CONS - Conservation; AG MECH - Agricultural Mechanization; and ORN HORT - Ornamental Horticulture

Occupational Areas - The first year occupational areas entered by employed graduates are presented in Table 8. Classification of firms employing graduates into occupational areas was based on the Standard Industrial Classification (SIC) codes listed in Appendix A.

The significant findings are:

1. Sixty percent of all employed graduates entered farming or an off-farm related agricultural industry.

2. The percent of graduates who were employed in non-related agricultural industry ranged from 24 percent for farm production and management to 76 percent for ornamental horticulture.

3. Forty-six percent of agricultural mechanization graduates were employed in farming.

TABLE 8

Occupation Areas Entered the First Year by Employed* 1968 New York State Secondary Agricultural Graduates by Specialized Area of Training

Occupational Area	Percent of Employed Graduates				Total All Areas
	FPM (N=136)	CONS (N=28)	AG MECH (N=39)	ORN HORT (N=17)	
					Percent
Farming	61	11	46	0	47
Off-Farm Agricultural Related	11	18	10	24	13
Non-Agricultural Related	24	67	44	76	38
Not Classified	4	4	0	0	2
Total Percent	100	100	100	100	100

*Of the total graduates responding 41 percent were employed, 1 percent were unemployed, 32 percent were receiving further education, and 27 percent were in military service.

FPM - Farm Production and Management; CONS - Conservation; AG MECH - Agricultural Mechanization; ORN HORT - Ornamental Horticulture

Occupational Categories and Groups - The classification of jobs reported by employed graduates into the Dictionary of Occupational Titles occupational categories and groups is presented in Appendix B. Classification in some instances was arbitrary due to incomplete information reported by graduates.

The findings are:

1. Jobs reported by graduates fell into various groups in all nine occupational categories.

2. Of the 207 employed graduates who responded, 105 reported jobs in the "Farming, Fishing, Forestry, and Related" category. The next two highest occupational categories were machine trade occupations with 26 jobs, and miscellaneous occupations with 23 jobs. The other 7 categories ranged from 3 to 13 in jobs reported by graduates.

Employed Graduates

Conditions of Employment

Wages Received - Table 9 presents the wages received by graduates in first year jobs. The significant findings are:

1. Sixty-five percent of all employed graduates reported an hourly wage rate. Of this 65 percent, 29 percent received less than $2.00 per hour. Over 50 percent of all graduates are employed for $2.75 per hours or less.

2. Fewer farm production and management graduates received wages in the $2.75 to above $3.00 categories than graduates in the other areas. It should be noted, however, that the high (33%) of farm production and management graduates responding in the "Other" category included percent of farm milk receipts, monthly wages, and percent of farm net income, which reflects the higher percent of these graduates who were self-employed.

TABLE 9

Wages Received by Employed* 1968 New York State Agricultural Secondary Graduates in First Year Jobs

Wage Range in Dollars per Hour	Percent of Employed 1968 Graduates				Total All Areas (N=217)
	FPM (N=130)	CONS (N=29)	AG MECH (N=40)	ORN HORT (N=18)	
					Percent
1.50 - 2.00	26	28	40	33	29
2.00 - 2.25	6	24	7	11	9
2.25 - 2.50	9	17	0	22	10
2.50 - 2.75	6	11	7	11	7
2.75 - 3.00	4	14	3	6	5
Above 3.00	2	3	10	11	5
Self-Employed	14	0	18	0	12
Other (monthly, etc.)	33	3	15	6	23
Total Percent	100	100	100	100	100

*Of the total graduates responding, 41 percent were employed; 1 percent were unemployed; 32 percent were receiving further education, and 27 percent were in military service.

FPM - Farm Production and Management; CONS - Conservation; AG MECH - Agricultural Mechanization; ORN HORT - Ornamental Horticulture

Full-time or Part-time Employment - The percent of graduates employed full-time and part-time is presented in Table 10. The important findings are:

1. Ninety percent of all employed graduates were employed full-time.

2. More Ornamental Horticulture graduates were employed part-time (16.7%) than were graduates in other areas. The interpretation of this finding is limited by the small (N=18) number of respondents.

TABLE 10

Percent of Employed* New York State Secondary Agricultural Graduates in First Year Full-Time and/or Part-Time Jobs by Specialized Area of Training

Type of Job	Percent of Graduates				Total All Areas
	FPM (N=134)	CONS (N=29)	AG MECH (N=41)	ORN HORT (N=18)	
					Percent
Full Time	91.0	93.1	87.8	83.3	90.0
Part Time	7.5	6.9	4.9	16.7	7.7
Full Time at More Than one Job	1.5	0.0	7.3	0.0	2.3
Total Percent	100.0	100.0	100.0	100.0	100.0

*Of the total graduates responding 41 percent were employed, 1 percent were unemployed, 32 percent were receiving further education, and 27 percent were in military service.

FPM - Farm Production and Management; CONS - Conservation; AG MECH - Agricultural Mechanization; ORN HORT - Ornamental Horticulture

Promotions or Pay Raises Received - Table 11 presents the percent of employed graduates who received promotions or pay raises.

The significant findings are:

1. Over one-half of all employed graduates received pay raises or promotions.

2. A higher percentage (76%) of employed conservation graduates received promotions or pay raises than graduates in the other areas. This finding should be interpreted in conjunction with the previous finding (Table 6) that 70 percent of conservation graduates were employed in non-conservation jobs.

The interpretation of these findings is limited by the lack of information as to the nature and extent of the promotions and pay raises which was not sufficient to be reported.

TABLE 11

Percent* of Employed** 1968 New York State Secondary Agricultural Graduates Receiving Job Promotions or Pay Raises by Specialized Area of Training

	Percent of Employed Graduates			
	FPM (N=129)	CONS (N=29)	AG MECH (N=41)	ORN HORT (N=17)
Received promotion or pay raise	49	76	54	59
Did not receive promotion or pay raise	51	24	46	41
Total Percent	100	100	100	100

*Excludes graduates who reported, "self employed" employment status.

**Of the total graduates responding 41 percent were employed, 1 percent were unemployed, 32 percent were receiving further education, and 27 percent were in military service.

FPM - Farm Production and Management; CONS - Conservation; AG MECH - Agricultural Mechanization; and ORN HORT - Ornamental Horticulture

Additional Training Provided by Employers - Table 12 presents the percent of employed graduates provided additional training by employers. About one-fourth of all graduates received additional training. The highest percent of graduates receiving training was in ornamental horticulture (33%) and the lowest was in agricultural mechanization (17%). A limitation of this finding was that training was not specifically defined and on job training may not have been included.

TABLE 12

Percent* of Employed** 1968 New York State Secondary Agricultural Graduates Provided Additional Training by Employers by Specialized Area of Training

	Percent of Employed Graduates			
	FPM (N=130)	CONS (N=29)	AG MECH (N=41)	ORN HORT (N=18)
Provided additional training by employer	23	28	17	33
Were not provided additional training by employer	77	72	83	67
Total Percent	100	100	100	100

*Excludes graduates who reported, "self-employed" employment status.

**Of the total graduates responding 41 percent were employed, 1 percent were unemployed, 32 percent were receiving further education, and 27 percent were in military service.

FPM - Farm Production and Management; CONS - Conservation; AG MECH - Agricultural Mechanization; and ORN HORT - Ornamental Horticulture

Job Satisfaction

Tables 13 through 17 show the job satisfaction of employed graduates by total group and specialized area. The important Job Satisfaction findings are:

1. Two-thirds or more of employed graduates in all areas were satisfied with the people with whom they worked, and a maximum of 3 percent were dissatisfied.

2. Sixty-one or more percent of employed graduates in all areas were satisfied with the supervision they received and a maximum of 11.1 percent were dissatisfied.

3. Satisfaction of employed conservation graduates with the work required was lower (46.7%) than for graduates of any of the other three areas, of which at least 61 percent were satisfied.

4. Employed conservation and ornamental horticulture graduates were only 20.7 percent and 22.2 percent respectively satisfied with the promotions available in their jobs. This is low compared to the 58 percent satisfaction of graduates in the other two areas.

5. Employed graduates of conservation and ornamental horticulture were less satisfied with the pay received than were graduates in the other two areas.

TABLE 13

Job Satisfaction of Employed* 1968 New York State Secondary Agricultural Graduates
(N = 220)

Job Condition	Percent of Employed Graduates					Total
	Satisfied	Somewhat Satisfied	Neutral	Somewhat Dissatis-fied	Dissatis-fied	
People with whom they worked	78.6	9.0	8.3	3.2	0.9	Per-cent 100
The super-vision they received	68.5	11.8	11.0	4.6	4.1	100
The work required	63.5	17.6	9.9	3.6	5.4	100
The pro-motions available	49.8	8.4	18.1	7.9	5.8	100
The pay received	43.2	19.1	15.0	8.2	14.5	100

*Of the total graduates responding 41 percent were employed, 1 percent were unemployed, 31 percent were receiving further education, and 27 percent were in military service.

TABLE 14

Job Satisfaction of Employed* 1968 New York State Secondary Agricultural Graduates Trained in Farm Production and Management
(N = 132)

Job Condition	Percent of Employed Graduates					
	Satisfied	Somewhat Satisfied	Neutral	Somewhat Dissatis-fied	Dissatis-fied	Total
People with whom they worked	78.9	6.8	9.8	3.7	.8	Per-cent 100
The super-vision they received	69.7	12.1	11.4	4.5	2.3	100
The work required	67.9	18.7	8.9	1.5	3.0	100
The pro-motions available	57.7	6.9	16.9	6.2	12.3	100
The pay received	44.0	20.4	15.9	7.6	12.1	100

*Of the total Farm Production and Management graduates responding 38 percent were employed, 1 percent were unemployed, 37 percent were receiving further education, and 24 percent were in military service.

TABLE 15

Job Satisfaction of Employed* 1968 New York State Secondary Agricultural Graduates Trained in Conservation
(N = 30)

Job Condition	Percent of Employed Graduates					Total
	Satisfied	Somewhat Satisfied	Neutral	Somewhat Dissatisfied	Dissatisfied	
People with whom they worked	86.7	10.0	0.0	0.0	3.3	Percent 100
The supervision they received	66.7	13.3	10.0	3.3	6.7	100
The work required	46.7	16.7	16.7	6.6	13.3	100
The promotions available	20.7	6.9	24.1	17.3	31.0	100
The pay received	33.3	16.7	16.7	13.3	20.0	100

* Of the total Conservation graduates responding 44 percent were employed, 1 percent were unemployed, 11 percent were receiving further education, and 44 percent were in military service.

TABLE 16

Job Satisfaction of Employed* 1968 New York State Secondary Agricultural Graduates Trained in Agricultural Mechanization
(N = 61)

Job Condition	Percent of Employed Graduates					Total
	Satisfied	Somewhat Satisfied	Neutral	Somewhat Dissatis-fied	Dissatis-fied	
People with whom they worked	76.9	12.8	5.1	5.2	0.0	Per-cent 100
The super-vision they received	69.2	12.8	7.8	5.1	5.1	100
The work required	62.5	17.5	7.5	7.5	5.0	100
The pro-motions available	57.9	10.5	18.4	5.3	7.9	100
The pay received	52.5	20.0	10.0	7.5	10.0	100

* Of the total Agricultural Mechanization graduates responding 53 percent were employed, 0 percent were unemployed, 17 percent were receiving further education, and 30 percent were in military service.

TABLE 17

Job Satisfaction of Employed* 1968 New York State Secondary Agricultural Graduates Trained in Ornamental Horticulture
(N = 18)

Job Condition	Percent of Employed Graduates					Total
	Satisfied	Somewhat Satisfied	Neutral	Somewhat Dissatis-fied	Dissatis-fied	
People with whom they worked	66.6	16.7	16.7	0	0	Per-cent
The super-vision they received	61.1	5.6	16.7	5.5	11.1	100
The work required	61.1	11.1	11.1	5.6	11.1	100
The pro-motions available	22.2	16.7	16.7	11.1	33.3	100
The pay received	33.3	11.1	16.7	5.6	33.3	100

* Of the total Ornamental Horticulture graduates responding 40 percent were employed, 5 percent were unemployed, 25 percent were receiving further education, and 30 percent were in military service.

Relevance of Training

In each specialized area of training, graduates were asked to rate a list of knowledges for that area. Graduates rated each knowledge or ability as to: whether the "training was received," the "adequacy of the training" received, and the "need for the training" on the graduates' present job. The same rating procedure was used by the graduates' employers except that the "training received" category was deleted.

A fixed response pattern was found on a number of graduate questionnaires. This indicates that some graduates may not have read each individual knowledge or ability before responding which would reduce the validity of the findings. No pattern of responses was found on the employer questionnaires. The findings of this section of the study should also be interpreted in consideration of that, with the exception of farm production and management graduates, less than 46 percent of the employed graduates had first year employment in the area for which they had received training.

Training Received

At least 50 percent of employed graduates in each of the four specialized areas of agriculture responded that they had received training for 77 or more percent (range of 77-95 percent) of the knowledges and abilities listed.

The percent for each specialized area is presented in Table 18. Appendices C-2 through C-5 includes the graduates' response percent as to training received for individual knowledges and abilities by specialized area.

TABLE 18

Distribution of Knowledges and Abilities by Percent of Graduates Responding "Yes - Training was Received" by Specialized Area of Training

Percentage of Employed Graduates Responding that Training for the Knowledges and Abilities Had Been Received	Percent of Knowledges and Abilities			
	FPM (N=99)*	CONS (N=87)*	AG MECH (N=75)*	ORN HORT (N=88)*
76 - 100	59.6	41.4	9.3	30.7
51 - 75	35.4	28.7	81.4	46.6
26 - 50	5.0	23.0	9.3	21.6
1 - 25	0.0	6.9	0.0	1.1
Total Percent	100.0	100.0	100.0	100.0

*N is the number of knowledges and abilities for the specialized area of training.

FPM - Farm Production and Management; CONS - Conservation; AG MECH - Agricultural Mechanization; and ORN HORT - Ornamental Horticulture

Adequacy of Training

Graduate and employer ratings of the adequacy of the training received are listed in Tables 19 and 20. The ratings for individual knowledges and abilities are presented in Appendices C-2 through C-5.

Graduate Ratings - Table 19 presents a summary of employed graduates' rating of knowledges and abilities as to adequacy of training. The important finding is that over 50 percent of the graduates in each of the four specialized areas rated 90 or more percent of the knowledges and abilities in their area as "Superior" or "Adequate" as to adequacy of training.

Appendices C-2 through C-5 include the percent distribution of graduates' responses as to the adequacy of training received for individual knowledges or abilities.

Employer Ratings - Table 20 presents employers' ratings of graduates' job qualification. The significant finding is that employers rated 97.5 percent of graduates as meeting minimum job qualifications, and a minimum of 70 percent of graduates as well qualified.

TABLE 19

Percent of Knowledges and Abilities Rated Adequate or Superior* as to Adequacy of Training by Over Seventy-five Percent of New York Secondary Graduates and Their Employers by Specialized Area of Training

Respondent	Percent of Knowledges and Abilities			
	FPM (N=99)**	CONS (N=87)**	AG MECH (N=75)**	ORN HORT (N=88)**
Graduates	100	90	96	95
Employers	95	46	43	0.0

*A rating scale of "Superior," "Adequate," "Inadequate," and "Does Not Apply" was used.

**N is the number of knowledges and abilities for the specialized area of training.

FPM - Farm Production and Management; CONS - Conservation; AG MECH - Agricultural Mechanization; and ORN HORT - Ornamental Horticulture

TABLE 20

How Did Employers Evaluate the Qualification of 1968 New York State Secondary Agriculture Graduates for Their Employment?

Qualification Level	Percent of Graduates				Total All Areas
	FPM (N=76)	CONS (N=13)	AG MECH (N=21)	ORN HORT (N=10)	
					Percent
Well qualified	71	62	71	70	70.0
Meets minimum qualifications	26	38	24	30	27.5
Not qualified, needs additional training	3	0	5	0	2.5
Total Percent	100	100	100	100	100.0

FPM - Farm Production and Management; CONS - Conservation; AG MECH - Agricultural Mechanization; and ORN HORT - Ornamental Horticulture

Need for Training

Table 22 presents the number and percent of knowledges and abilities rated essential to desirable as to "need for training." The individual knowledges and abilities are ranked as to "need in the graduate's present job" in Tables 23 to 25.

The significant findings are:

1. The knowledges and abilities in farm production and management were ranked much higher as to need than those in the other three areas. Employers' ratings were much lower than graduates' ratings.

2. The knowledges and abilities in conservation and agricultural mechanization were rated low as to need by both graduates and employers.

3. Over half of ornamental horticulture knowledges and abilities were rated by graduates as at least "desirable."

4. There are wide differences between employers' and graduates' ratings of the need for individual knowledges and abilities as evidenced by the differences in ranking.

5. The ranking of the seven common (first 7 items in each area) knowledges and abilities dealing with work attitudes and habits was high in all cases.

As would be expected the need for agricultural knowledges and abilities in the graduates' job is directly related to the number of graduates employed in the area of specialization they received training for (Table 6).

TABLE 21

Percent of Knowledges and Abilities in Each Area of Specialized Training that Were Ranked "Essential" to "Desirable" (1.0-2.0) as to Need for Training

Respondent	Percent of Knowledges and Abilities			
	FPM (N=100)*	CONS (N=87)*	AG MECH (N=75)*	ORN HORT (N=86)*
Graduates	81	7	17	51
Employers	47	6	32	insufficient data

*N is the number of knowledges for the specialized area of training.

FPM - Farm Production and Management; CONS - Conservation; AG MECH - Agricultural Mechanization; and ORN HORT - Ornamental Horticulture

See Appendices C-2 to C-5 for ratings of individual knowledges and abilities.

TABLE 22

Ranking of Farm Production and Management Knowledges and Abilities as to "Need for Training"* by Graduates and Employers

Graduate (N=99)		Employer (N=67)		Item Number	Farm Production and Management Knowledge or Ability
Rank	Mean Score	Rank	Mean Score		
1	1.48	38	2.21	27	Buying insurance suited to the farm business and the family.
1	1.48	32	2.11	29	Understanding the meaning of common legal terms and instruments, such as "mortgage" and "will."
2	1.57	22	1.94	30	Determining power and equipment needs.
3	1.60	35	2.16	28	Knowing when legal advice is needed.
4	1.68	41	2.24	43	Selecting the best market and marketing the crop.
5	1.69	32	2.11	31	Calculating farm machinery costs.
5	1.69	15	1.84	37	Preparing the soil for planting.
5	1.69	19	1.89	51	Determining soil type, texture and drainage.
6	1.70	20	1.90	41	Controlling crop insects, diseases and other pests.
7	1.71	12	1.79	6	Handles routine mathematical problems.
8	1.71	37	2.19	13	Identifying and selecting sources of farm credit.
9	1.72	2	1.21	2	Accepts and carries out responsibility.
9	1.72	3	1.43	5	Assumes intiative when necessary.
9	1.72	26	2.02	35	Selecting the field(s) for the crop.
10	1.73	10	1.77	62	Raising livestock replacements.
11	1.74	20	1.90	39	Controlling weeds by chemicals or mechanical tillage.
11	1.74	18	1.88	53	Taking soil samples and having them tested.
11	1.74	24	1.98	55	Selection of least cost commercial fertilizer.

*Knowledges and abilities were rated as to need in the graduates' present job. The three point rating scale of "E - Essential," "D - Desirable," and "U - Undesirable" were assigned the values 1, 2, and 3 respectively. Thus a score of 1.0 would indicate a knowledge or ability most needed and 3.0 an unnecessary knowledge or ability.

TABLE 22--Continued

Graduate (N=99)		Employer (N=67)		Item Number	Farm Production and Management Knowledge or Ability
Rank	Mean Score	Rank	Mean Score		
11	1.74	7	1.70	76	Knowing and following proper milking procedures.
12	1.75	17	1.86	42	Harvesting and storing the crop.
12	1.75	5	1.66	96	Knowing and following safety rules in operation of tractors machinery and equipment.
13	1.76	27	2.03	21	Using agricultural service agencies such as Cooperative Extension and DHIA.
13	1.76	22	1.94	38	Planting and/or transplanting crops.
13	1.76	15	1.84	40	Fertilizing and liming based on soil tests.
13	1.76	11	1.78	63	Identifying and culling non-profitable livestock.
13	1.76	10	1.77	97	Proper maintenance operation and adjustment of farm machines.
14	1.77	1	1.21	4	Follows directions.
14	1.77	22	1.94	54	Analyze test results to determine lime and fertilizer needs.
14	1.77	22	1.94	93	Finding and correcting minor engine trouble.
15	1.78	39	2.22	33	Buying machinery by owning, leasing, or partnership depending upon cost.
16	1.79	4	1.50	3	Meets,and gets along with people.
16	1.79	26	2.02	34	Selecting recommended crop varieties adapted to the area.
16	1.79	23	2.00	52	Determining land use capability class from physical characteristics.
16	1.79	30	2.08	59	Using the services of conservation agencies.
16	1.79	14	1.83	60	Selecting foundation and/or replacement livestock.
16	1.79	24	1.98	78	Using proper procedures to market quality milk.
16	1.79	23	1.95	79	Understands and uses milk testing to determine milk production.
17	1.80	9	1.75	7	Writes clearly and spells correctly.
17	1.80	28	2.05	36	Treatment of seeds, bulbs and plants for planting.
17	1.80	24	1.98	64	Determining and balancing least cost feed rations based on production, and/or size and pregnancy.
17	1.80	16	1.85	81	Knowing and following safe shop hazards.
18	1.81	18	1.88	1	Neat and well groomed.

TABLE 22--Continued

Graduate (N=99)		Employer (N=67)		Item Number	Farm Production and Management Knowledge or Ability
Rank	Mean Score	Rank	Mean Score		
18	1.81	18	1.88	56	Using farm manure as a fertilizer.
18	1.81	24	1.98	66	Determining livestock housing needs.
19	1.82	21	1.91	23	Knowing and following public health laws in marketing.
-	-	-	-	-	
20	1.83	24	1.98	65	Knowing the different types of housing and their advantages.
21	1.83	36	2.18	77	Understands milk marketing.
22	1.84	28	2.05	67	Arranging housing for efficient use of labor.
22	1.84	34	2.14	87	Understanding the basic principles of electricity.
23	1.85	24	1.98	12	Planning for buying needed machines.
23	1.85	33	2.13	26	Understanding the different types and sources of insurance.
24	1.87	37	2.19	32	Planning and using a machinery replacement program.
25	1.88	35	2.16	94	Determining whether to repair or trade used machines needing repairs.
26	1.89	28	2.05	14	Taking an inventory to determine net worth.
26	1.89	17	1.86	16	Maintaining a good credit rating.
26	1.89	14	1.83	68	Understanding the cause, nature, and symptoms of livestock health problems.
26	1.89	26	2.02	82	Construction and repair by electric arc welding.
27	1.90	33	2.13	9	Factors to consider in buying or renting a farm.
27	1.90	24	1.98	18	Making out income tax returns.
27	1.90	43	2.27	22	Using farm market reports to market at a profit.
27	1.90	27	2.03	58	Using soil management practices to conserve soil.
27	1.90	43	2.27	83	Knows types and uses of paints.
28	1.91	24	1.98	57	Knowledge of the importance of soil, water, and wildlife conservation.
28	1.91	45	2.30	93	Doing new carpentry construction and repair.
29	1.92	21	1.91	10	Selecting and planning the kinds of crops and livestock to grow.
29	1.92	31	2.10	19	Analyzing the farm business from farm records.
29	1.92	35	2.16	50	Knowing how soils are formed.
29	1.92	26	2.02	80	Knowing how to establish a farm shop.

TABLE 22--Continued

Graduate (N=99)		Employer (N=67)		Item Number	Farm Production and Management Knowledge or Ability
Rank	Mean Score	Rank	Mean Score		
29	1.92	44	2.28	85	Determining amounts of and selecting plumbing materials needed.
30	1.93	30	2.08	15	Borrowing money wisely.
31	1.94	29	2.06	8	Factors to consider in deciding whether to farm.
31	1.94	17	1.86	17	Keeping good farm records.
32	1.95	29	2.06	61	Reading pedigrees.
32	1.95	37	2.19	99	Maintenance of electric motors.
33	1.96	50	2.40	90	Calculating amounts and selecting concrete and masonry materials needed.
33	1.96	48	2.35	91	Mixing, pouring, finishing, and curing concrete.
34	1.98	42	2.23	84	Painting farm structures and/or equipment.
34	1.98	47	2.34	89	Determining amounts of electrical materials needed.
35	1.99	51	2.40	44	Processing and packaging the crop.
35	1.99	43	2.27	100	Planning and constructing a water supply, sewage disposal and drainage service for farm structures.
36	2.01	28	2.05	11	Planning the farm buildings that are needed.
36	2.01	46	2.31	24	On farm storage of farm products such as grain or potatoes.
36	2.01	33	2.13	25	Knowing about farm organizations such as cooperatives and unions.
36	2.01	49	2.37	92	Making a working drawing and a bill of materials.
36	2.01	34	2.14	95	Determining whether to own, rent, or custom-hire farm machinery.
37	2.02	40	2.23	75	Selecting the least cost method of marketing.
37	2.02	43	2.27	86	Plumbing construction and repair.
38	2.04	40	2.23	20	Hiring and managing farm labor.
39	2.05	18	1.88	69	Maintaining health records.
40	2.07	53	2.63	48	Growing and harvesting forage crops.
40	2.07	6	1.69	73	Maintaining breeding records.
41	2.15	17	1.86	72	Understanding the process of reproduction.
42	2.16	8	1.72	71	Using veterinary services when necessary.
43	2.19	56	2.77	46	Growing small fruit-tree fruits and ornamental shrubs.
44	2.20	54	2.71	47	Pruning, training and thinning shrubs and trees.

TABLE 22--Continued

Graduate (N=99)		Employer (N=67)		Item Number	Farm Production and Management Knowledge or Ability
Rank	Mean Score	Rank	Mean Score		
45	2.22	55	2.74	43	Identifying small fruit-tree fruits and ornamental shrubs.
46	2.22	13	1.81	74	Maintaining production records.
47	2.25	22	1.94	70	Planning and using effective health programs.
48	2.27	57	2.85	49	Raising bees.

TABLE 23

Ranking of Conservation Knowledges and Abilities as to "Need for Training"* by Graduates and Employers

Graduate (N=30)		Employer (N=12)		Item Number	Conservation Knowledge or Ability
Rank	Mean Score	Rank	Mean Score		
1	1.17	1	1.33	4	Follows directions.
2	1.24	2	1.50	2	Accepts and carries out responsibility.
3	1.46	5	1.92	5	Assumes initiative when necessary.
4	1.55	3	1.58	3	Meets and gets along well with people.
5	1.86	6	2.08	6	Ability to handle routine mathematical problems.
6	2.07	4	1.73	1	Neat and well groomed.
7	2.10	7	2.17	7	Writes clearly and spells correctly.
8	2.28	10	2.45	8	Identification of trees.
9	2.30	11	2.55	78	Selection and use of nails, screws, and glues.
10	2.33	11	2.55	67	Servicing and repairing small gas engines.
11	2.36	14	2.82	9	Selecting sites for and planting trees.
12	2.37	11	2.55	87	Keeping and using business records.
13	2.41	14	2.82	10	Managing reforested lands by pruning, thinning, cutting, and weed control.
13	2.41	12	2.64	11	Protecting trees against fire.
13	2.41	15	2.91	12	Protecting trees against insects, diseases, and animals.
13	2.41	8	2.27	13	Reading and interpreting maps and land description.
13	2.41	8	2.27	77	Identification and selection of woods.
13	2.41	10	2.45	85	Understanding and complying with business laws, regulations, and ethics.
14	2.42	11	2.55	66	Operation, service, and adjustments of gasoline and diesel power units.
14	2.42	13	2.73	75	Joining metals by riveting and soldering.
15	2.43	14	2.82	19	Measuring and grading logs for sawing in the yard.

*Knowledges and abilities were rated as to need in the graduates' present job. The three-point rating scale of "E - Essential," "D - Desirable," and "U - Undesirable" were assigned the values 1, 2, and 3 respectively. Thus a score of 1.0 would indicate a knowledge or ability most needed and 3.0 an unnecessary knowledge or ability.

TABLE 23--Continued

Graduate (N=30)		Employer (N=12)		Item Number	Conservation Knowledge or Ability
Rank	Mean Score	Rank	Mean Score		
16	2.44	10	2.45	86	Reporting and paying federal, state, and local taxes.
17	2.46	14	2.82	16	Harvesting timber by marking, felling, pelling, and skidding.
17	2.46	11	2.55	74	Identification and use of metal-working tools.
18	2.48	12	2.64	54	Determining soil type, texture, and drainage.
19	2.50	14	2.82	20	Sawing logs into lumber.
19	2.50	15	2.91	27	Increasing wildlife numbers by planting cover and food and releasing game birds and animals.
19	2.50	10	2.45	50	Planning and using ditch and tile drainage systems.
19	2.50	11	2.55	51	Doing differential leveling.
19	2.50	12	2.64	52	Controlling soil erosion by contour stripes, ditches, sod waterways, and terraces.
19	2.50	10	2.45	71	Repair and maintenance of structures.
20	2.52	13	2.73	57	Analyzing test results to determine lime and fertilizer needs.
20	2.52	14	2.82	62	Controlling crop insect, weed, and disease pests.
20	2.52	14	2.82	79	Selection and use of finishing materials.
20	2.52	10	2.45	80	Identification, selection, and use of woodworking tools and equipment.
21	2.54	16	3.00	17	Selecting where to sell timber and/or pulp.
21	2.54	21	2.64	21	Piling and drying lumber.
21	2.54	14	2.82	61	Preparing crop seedbeds.
21	2.54	9	2.36	68	Servicing and repairing chain saws.
22	2.55	15	2.91	14	Cruising the stand to estimate yield and growth rates.
22	2.55	14	2.82	26	Identifying important wildlife species and their habitats.
22	2.55	9	2.36	49	Locating and building ponds.
22	2.55	11	2.55	56	Taking soil samples and having them tested.
22	2.55	11	2.55	58	Selection and application of commercial fertilizer and lime based on soil tests.
23	2.56	13	2.73	64	Determining time and procedure to harvest crops.
23	2.56	13	2.73	76	Joining metal by gas and/or arc welding.
24	2.57	16	3.00	15	Keeping records on forested lands as to income, expenses and yields.

TABLE 23--Continued

Graduate (N=30)		Employer (N=12)		Item Number	Conservation Knowledge or Ability
Rank	Mean Score	Rank	Mean Score		
24	2.57	12	2.64	25	Determining food, water, and cover needs of wildlife.
24	2.57	13	2.73	36	Planning a year-round or seasonal outdoor recreational area.
24	2.57	15	2.91	47	Using county, state, and federal assistance for outdoor recreation.
25	2.59	13	2.73	48	Managing streams by fencing, controlling pollution, dams, and fish ladders.
25	2.59	10	2.45	72	Maintenance and repair of water pumps and systems.
26	2.61	15	2.91	18	Loading and hauling logs to market.
26	2.61	16	3.00	31	Managing a fishing pond through fertilization, weed control, undesirable species, and harvesting.
26	2.61	13	2.73	53	Knowing how soils are formed.
26	2.61	12	2.64	59	Using farm manure as a fertilizer.
27	2.62	13	2.73	65	Operating machinery in harvesting crops.
28	2.63	16	3.00	33	Establishing and managing wildlife preserves.
28	2.63	13	2.73	82	Securing and using credit.
29	2.64	16	3.00	29	Controlling wildlife predators.
29	2.64	12	2.64	41	Developing and operating hiking and riding trails.
29	2.64	13	2.73	55	Determining land use capability class from physical characteristics.
30	2.65	13	2.73	35	Exploring opportunities for establishing a recreational business in an area.
30	2.65	12	2.64	70	Servicing electrical motors.
30	2.65	13	2.73	73	Maintenance and repair of recreational faculities and equipment.
31	2.67	13	2.73	37	Meeting state and local laws on outdoor recreation.
31	2.67	13	2.73	38	Establishing a safety program for outdoor recreation.
31	2.67	13	2.73	83	Planning the insurance program.
31	2.67	14	2.82	84	Hiring and managing employees.
32	2.68	16	3.00	22	Tapping trees and collecting sap from a sugar bush.
32	2.68	16	3.00	23	Operating a machine to make maple syrup.
32	2.68	13	2.73	40	Developing and operating camping grounds.

TABLE 23--Continued

Graduate (N=30)		Employer (N=12)		Item Number	Conservation Knowledge or Ability
Rank	Mean Score	Rank	Mean Score		
32	2.68	14	2.82	60	Knowing how plants grow, reproduce, and manufacture food.
32	2.68	14	2.82	63	Providing moisture through irrigation.
33	2.70	16	3.00	69	Servicing and repairing outboard motors.
34	2.71	16	3.00	24	Marketing maple syrup products.
34	2.71	15	2.91	42	Planning insurance program for outdoor recreation.
34	2.71	12	2.64	43	Developing and operating winter recreational areas.
35	2.72	16	3.00	28	Growing fish in a fish hatchery.
35	2.72	16	3.00	46	Getting loans from lending agencies for recreational development.
36	2.74	14	2.82	34	Working with state and federal agencies in wildlife conservation.
37	2.77	16	3.00	30	Rearing of game birds in confinement.
38	2.78	16	3.00	32	Growing animals on a fur farm.
38	2.78	16	3.00	81	Establishing a recreational business.
39	2.79	14	2.82	39	Developing and operating a marina.
40	2.79	15	2.91	44	Planning and operating a hunting and fishing preserve.
41	2.79	15	2.91	45	Planning and operating a riding stable and bridle trail program.

TABLE 24

Ranking of Agricultural Mechanization Knowledges and Abilities as to "Need for Training"*by Graduates and Employers

Graduate (N=31)		Employer (N=14)		Item Number	Agricultural Mechanization Knowledge or Ability
Rank	Mean Score	Rank	Mean Score		
1	1.18	2	1.08	8	Knowing and following safe working procedures.
2	1.36	1	1.04	4	Follows directions.
3	1.45	1	1.04	2	Accepts and carries out responsibility.
4	1.55	4	1.31	5	Assumes initiative when necessary.
5	1.82	3	1.12	3	Meets and gets along well with people.
5	1.82	5	1.54	9	Knowing what type of fire extinguisher to use.
5	1.82	12	1.85	33	Cleaning, regapping, and installing spark plugs.
6	2.00	9	1.77	1	Neat and well groomed.
6	2.00	16	2.00	14	Keeping business records.
6	2.00	7	1.69	16	Reading parts manuals.
6	2.00	21	2.12	18	Ordering parts for repair jobs.
6	2.00	13	1.88	32	Charging a battery.
6	2.00	11	1.81	35	Installing and adjusting breaker points.
7	2.09	11	1.81	7	Writes clearly and spells correctly.
7	2.09	8	1.75	13	Checking quality of work.
7	2.09	13	1.88	31	Installing new gaskets.
7	2.09	19	2.08	39	Servicing and repairing cooling systems.
7	2.09	15	1.96	40	Servicing and repairing fuel systems.
7	2.09	18	2.07	48	Adjusting and repairing farm machinery and equipment.
8	2.10	11	1.81	19	Joining metals with arc and/or gas welding equipment.
9	2.18	6	1.59	6	Ability to handle routine mathematical problems.
9	2.18	17	2.04	26	Using a torque wrench.

* Knowledges and abilities were rated as to need in the graduates' present job. The three-point rating scale of "E - Essential," "D - Desirable," and "U - Undesirable" were assigned the values 1, 2, and 3 respectively. Thus a score of 1.0 would indicate a knowledge or ability most needed and 3.0 an unnecessary knowledge or ability.

TABLE 24--Continued

Graduate (N=31)		Employer (N=14)		Item Number	Agricultural Mechanization Knowledge or Ability
Rank	Mean Score	Rank	Mean Score		
9	2.18	15	1.96	27	Adjusting valve clearance.
9	2.18	17	2.04	29	Installing piston rings, wrist pins and bearings.
9	2.18	16	2.00	30	Checking bearing clearances.
9	2.18	21	2.12	34	Testing condensers and coils.
9	2.18	17	2.04	36	Ignition timing.
9	2.18	22	2.15	37	Testing generator output.
9	2.18	14	1.92	38	Locating ignition circuit troubles.
9	2.18	24	2.22	41	Servicing and/or repair of hydraulic units.
9	2.18	24	2.22	42	Servicing and/or repairing standard transmissions.
10	2.20	19	2.08	24	Locating common engine troubles with electronic test equipment.
11	2.22	16	2.00	25	Replacing valves and valve seats.
12	2.27	26	2.31	47	Set up farm machinery and equipment.
13	2.30	28	2.38	15	Pre-ordering parts for stock.
13	2.30	17	2.04	23	Using the compression tester.
13	2.30	21	2.12	28	Removing and installing sleeves.
13	2.30	30	2.42	51	Calibrating fertilizer applying machinery.
13	2.30	31	2.46	52	Determining present and future needs for materials handling equipment.
13	2.30	37	2.62	65	Servicing and repairing a water system.
13	2.30	28	2.38	66	Understanding the electrical code.
13	2.30	27	2.33	67	Selecting electric motors.
13	2.30	26	2.31	68	Servicing electric motors.
13	2.30	28	2.38	69	Installing electrical equipment.
14	2.36	32	2.48	43	Servicing automatic transmissions.
14	2.36	26	2.31	50	Calibrating weed sprayers.
15	2.40	23	2.19	17	Identifying parts from customer's description.
15	2.40	20	2.11	20	Servicing magnetos.
15	2.40	11	1.81	21	Operating power metal working equipment.
15	2.40	30	2.42	59	Selecting material, mixing, pouring, and finishing concrete.
15	2.40	39	2.64	64	Installing a water system.
15	2.40	34	2.52	72	Doing carpentry work in building farm structures.
16	2.45	10	1.80	10	Preparing a shop order.
16	2.45	37	2.62	44	Repairing automatic transmissions.
16	2.45	29	2.40	45	Servicing diesel fuel systems.
16	2.45	25	2.30	49	Calibrating planting machines.

TABLE 25--Continued

Graduate (N=31)		Employer (N=14)		Item Number	Agricultural Mechanization Knowledge or Ability
Rank	Mean Score	Rank	Mean Score		
17	2.50	30	2.42	22	Using the dynamometer.
17	2.50	36	2.56	54	Installing, repairing, adjusting, servicing, and operating silage equipment.
17	2.50	35	2.54	60	Ventilating agricultural buildings.
18	2.55	30	2.42	11	Hiring and supervising employees.
18	2.55	24	2.22	12	Scheduling shop work.
19	2.60	36	2.56	55	Installing, repairing, adjusting, servicing, and operating grain handling equipment.
19	2.60	31	2.46	63	Determining water needs.
19	2.60	33	2.50	70	Protecting structures from lightning.
19	2.60	35	2.54	71	Planning and selecting materials for farm structures.
19	2.60	26	2.31	73	Making out a bill of materials.
20	2.64	31	2.46	46	Making service calls to customers.
21	2.70	31	2.46	53	Installing, repairing, adjusting, servicing, and operating gutter cleaners.
22	2.80	36	2.56	56	Planning a milking system.
22	2.80	40	2.73	61	Installing a hay drying system.
22	2.80	41	2.80	62	Servicing, and/or repairing a hay drying system.
22	2.80	30	2.42	74	Selecting, servicing, and repairing light earth moving equipment.
22	2.80	38	2.63	75	Selecting, repairing, servicing, and operating irrigation equipment.
23	2.90	40	2.73	57	Installing a milking system.
23	2.90	39	2.64	58	Servicing and repairing a milking system.

TABLE 25

Ranking of Ornamental Horticulture Knowledges and Abilities as to "Need for Training"+ by Graduates and Employers

Graduate (N=24)		Employer (N=3*)		Item Number	Ornamental Horticulture Knowledge or Ability
Rank	Mean Score	Rank	Mean Score		
1	1.22	-	-	4	Follows directions.
2	1.50	-	-	2	Accepts and carries out responsibility.
3	1.56	-	-	19	Selection, operation, adjustment, maintenance, and repair of hand tools and equipment.
4	1.61	-	-	3	Meets, and gets along well with people.
5	1.62	-	-	7	Writes clearly and spells correctly.
6	1.65	-	-	5	Assumes initiative when necessary.
7	1.69	-	-	13	Reporting and paying Federal, State, and local taxes.
8	1.71	-	-	11	Merchandising horticultural products and/or services.
9	1.75	-	-	6	Ability to handle routine mathematical problems.
10	1.79	-	-	61	Preparing and using greenhouse soils and other plant growing media.
11	1.83	-	-	62	Propagating greenhouse crops.
12	1.84	-	-	20	Planning and building frames, plastic houses, flats, benches, carts, and garden accessories.
13	1.85	-	-	46	Identifying and controlling diseases of ornamental plants.
14	1.88	-	-	17	Selection, operation, adjustment, maintenance, and repair of power mowers, tractors, and other garden equipment.
14	1.88	-	-	66	The culture of bedding plants.
15	1.89	-	-	16	Keeping and using business records.
15	1.89	-	-	41	Selecting and applying lime and fertilizer based on soil tests.

+Knowledges and abilities were rated as to need in the graduates' present job. The three point rating scale of "E - Essential," "D - Desirable," and "U - Undesirable" were assigned the values 1, 2, and 3 respectively. Thus a score of 1.0 would indicate a knowledge or ability most needed and 3.0 an unnecessary knowledge or ability.

*Insufficient data

TABLE 25--Continued

Graduate (N=24)		Employer (N=3*)		Item Number	Ornamental Horticulture Knowledge or Ability
Rank	Mean Score	Rank	Mean Score		
15	1.89	-	-	45	Identifying and controlling insects and other animal pests of ornamental plants.
15	1.89	-	-	56	Using the proper planting methods.
15	1.89	-	-	63	Identifying greenhouse plant materials.
15	1.89	-	-	68	Operating greenhouse structures - heat, light, and ventilation.
16	1.90	-	-	32	Identifying ornamental plants.
17	1.94	-	-	36	Taking soil samples and sending them in for analysis.
17	1.94	-	-	37	Propagating plant materials by cuttings, seed, transplanting, budding, and grafting.
18	1.95	-	-	34	Selecting seeds, plants, and bulbs.
18	1.95	-	-	43	Selecting and using artificial soil materials for the garden and greenhouse.
18	1.95	-	-	47	Identifying and controlling weeds in ornamental crops.
18	1.95	-	-	58	Reducing damage to trees from construction work.
18	1.95	-	-	88	Controlling insects, pests, diseases, and weeks in turf.
19	2.00	-	-	10	Hiring and managing employees.
19	2.00	-	-	12	Understanding and complying with business laws, regulations, and ethics.
19	2.00	-	-	22	Maintaining horticultural structures involving painting, glazing, treating, and repairing.
19	2.00	-	-	25	Selection and maintaining electric motors.
19	2.00	-	-	31	The types, growth, characteristics, and uses of ornamental plants.
19	2.00	-	-	33	Understanding how the parts of a plant contribute to its growth.
19	2.00	-	-	35	Planting seeds and bulbs.
19	2.00	-	-	38	Understanding the economic importance, origin, and types of soils.
19	2.00	-	-	39	Understanding soil: texture, color, structure, drainage, and productivity.
19	2.00	-	-	40	Using good tillage practices, maintaining organic matter, and an adequate water supply.

*Insufficient data.

TABLE 25--Continued

Graduate (N=24)		Employer (N=3*)		Item Number	Ornamental Horticulture Knowledge or Ability
Rank	Mean Score	Rank	Mean Score		
19	2.00	-	-	44	Using manure and other natural fertilizing materials.
19	2.00	-	-	50	Making, using, and reading simple plot plans.
19	2.00	-	-	57	Maintaining trees and shrubs.
19	2.00	-	-	60	Maintaining gardens, flower bordens, and hedges.
19	2.00	-	-	67	The culture of potted plants.
19	2.00	-	-	83	Preparing soils for establishment of turf.
20	2.05	-	-	21	Planning and building concrete construction in landscaping work, building construction and concrete units.
20	2.05	-	-	27	Planning a water system.
20	2.05	-	-	42	Understanding and controlling soil erosion.
20	2.05	-	-	64	Culture of common cut flowers.
21	2.06	-	-	14	Understanding and using markets and marketing methods.
21	2.06	-	-	55	Preparing to plant trees and shrubs.
21	2.06	-	-	75	Choosing the nursery site-soil requirements, space requirements, and the right business location.
21	2.06	-	-	78	Securing and handling plant materials.
21	2.06	-	-	82	Managing the propagation greenhouse and other plant starting and holding structures.
21	2.06	-	-	84	Selecting appropriate turf grasses.
21	2.06	-	-	85	Establishing turf.
22	2.10	-	-	26	Planning wiring and distribution systems.
22	2.10	-	-	48	Landscape draining techniques and materials.
23	2.11	-	-	18	Selection, operation, adjustment, maintenance, and repair of sprayers and dusters.
23	2.11	-	-	28	Maintaining the water system.
23	2.11	-	-	65	Forcing bulbs.
23	2.11	-	-	77	Preparing and managing nursery soils.
23	2.11	-	-	87	Maintaining and renovating older lawns.
24	2.15	-	-	53	Landscaping larger properties - principles, layout, selecting materials, cost, and specifications.

*Insufficient data.

TABLE 25--Continued

Graduate (N=24)		Employer (N=3*)		Item Number	Ornamental Horticulture Knowledge or Ability
Rank	Mean Score	Rank	Mean Score		
25	2.16	-	-	23	Welding operations involving arc welding and oxyacetylene welding.
25	2.16	-	-	30	Maintaining and operating steam heating systems.
25	2.16	-	-	49	Understanding and using basic design principles.
25	2.16	-	-	52	Landscaping recreational areas.
25	2.16	-	-	59	Removing trees and shrubs from landscape settings.
25	2.16	-	-	80	Culture of plants in the nursery.
26	2.17	-	-	1	Neat and well groomed.
26	2.17	-	-	9	Planning the insurance program.
26	2.17	-	-	29	Selecting, servicing, and operating irrigation systems.
26	2.17	-	-	86	Management of the newly established stands of turf.
27	2.18	-	-	15	Understanding and using trade organizations and government agencies.
27	2.18	-	-	73	Merchandising floral arrangements and pieces.
27	2.18	-	-	74	Making Christmas decorations.
28	2.21	-	-	51	Landscaping public areas - principles, layout, selecting materials, costs, and specifications.
28	2.21	-	-	81	Propagating nursery stock.
29	2.22	-	-	76	Laying out and arranging the nursery.
29	2.22	-	-	79	Planting and transplanting nursery stock.
30	2.25	-	-	24	Other metalworking operations involving soldering, sheet metal,and cold metal work.
30	2.25	-	-	54	Landscape surveying - measurement of distances, making field notes, using and caring for survey instruments
31	2.28	-	-	70	Understanding the principles of floral design.
31	2.28	-	-	71	Knowing floral design techniques.
31	2.28	-	-	72	Constructing arrangements.
32	2.29	-	-	8	Securing and using credit.
33	2.33	-	-	69	Preparing produce for sale by harvesting, grading, packing, and selling.

*Insufficient data.

Image of Farming and Off-Farm Related Agricultural Industry

Graduates in each specialized area of agriculture responded to similar image instruments for farming and off-farm related agricultural industry. The percent of graduates in the different image levels is presented in Table 26. The establishment of the image levels was arbitrary by the authors.

The significant findings are:

1. Seventy-five percent of all graduates held a positive or high positive, image of farming.

2. Farm production and management graduates held the highest image of farming. Graduates of the other three specialized areas were somewhat lower and nearly equal in their image of farming.

3. Eighty-five percent of all graduates held a positive or high positive, image of off-farm related agricultural industry.

4. In all specialized areas the image of farming held by graduates is lower than the image held for off-farm related agricultural industry.

5. Ornamental horticulture graduates held a lower image of off-farm related agricultural industry than did graduates in the other three specialized areas.

TABLE 26

Distribution of Image Scores* of 1968 New York Secondary Agricultural Graduates for Farming and Off-Farm Related Agricultural Industry by Specialized Area of Training

Industry	Image Level (Score)	Percent of Graduates			
		FPM (N=280)	CONS (N=39)	AG MECH (N=61)	ORN HORT (N=33)
Farming	High Positive (35-42)	14.6	10.3	13.1	6.1
	Positive (28-34)	65.7	64.1	72.1	69.7
	Negative (21-27)	18.9	23.1	14.8	24.2
	Low Negative (14-21)	0.8	2.5	-	-
	(Mean Score)	(33.33)	(29.56)	(30.9)	(29.54)
Off-Farm Related Agricultural Industry	High Positive (35-42)	41.8	38.5	41.0	6.1
	Positive (28-34)	52.9	60.0	50.8	78.8
	Negative (21-27)	5.3	2.5	8.2	12.1
	Low Negative (14-21)	-	-	-	3.0
	(Mean Score)	(33.66)	33.23)	(33.78)	(30.81)

*Image scores reflect a cumulative score for 14 items rated on a scale of "agree," "neutral," and "disagree." For each item a positive image was assigned the value of "3," a neutral image a value of "2,"and a negative image of value of "1," making the maximum image score 42 and the minimum score 14.

FPM - Farm Production and Management; CONS - Conservation; AG MECH - Agricultural Mechanization; and ORN HORT - Ornamental Horticulture

The Relationship of Agricultural Image to Job Satisfaction

Pearson product-moment correlations were run to determine the relationship between graduates' image of agriculture and his job satisfaction. Correlation levels of plus 0.6 or higher, and minus 0.60 or lower were arbitrarily set as statistically significant.

It was found that no statistically significant positive or negative correlation existed:

1. Between image of farming and image of off-farm related agricultural industry for all graduates.

2. Between image of farming and the five individual job satisfaction conditions (i.e. people worked with; supervision received; work performed; promotions available; and pay received), and between image of the off-farm related agricultural industry and the five individual job satisfaction conditions for the following groupings of graduates:

   a. Employed graduates of the areas of farm production and management, conservation, agricultural mechanization, and ornamental horticulture.
   b. Graduates employed in, and not in, the specialized area of agriculture for which training was received.
   c. Graduates employed in farming, off-farm related agricultural industry, and non-agricultural related industry.

The correlations ranged from minus 0.263 to plus 0.550.

A Procedural Follow-up Model for Vocational Education

The procedural model for this study is presented on pages 5 through 14 of this report. The instruments used are included as Appendices C-1 through D-5.

The procedures used to conduct the study were effective to meet the stated research objectives. The knowledges and abilities listed for each specialized area of agriculture were essentially those for which training had been received.

Needed procedural modifications that were indicated through use of the model are:

1. Additional efforts should be made to secure complete listings of graduates from all schools. This is especially important in the three specialized areas of conservation, agricultural mechanization, and ornamental horticulture in order to provide a large number of employed graduates, and therefore an adequate number of employers.

2. Further use of the image scales is needed to establish validity (Appendix C-1, questions 4 and 5).

3. A question to determine the overall job satisfaction of employed graduates should be added to the general graduate questionnaire (Appendix C-1).

4. The question on the additional training provided by employers (Appendix C-1, question 19) should be revised to provide information to differentiate between the on-the-job, and formalized training provided to graduates.

5. The general graduate questionnaire should include a question to identify the name and title of the graduate's immediate job supervisor.

6. The lists of knowledges and abilities on the specialized area questionnaires should be shortened. The fixed pattern of responses by a number of graduates indicates that graduates are unwilling to respond accurately to the number (75 to 100) of knowledges and abilities listed. The lists should be reduced by using more generalized statements which include two or more of the knowledges and abilities listed on the instrument used in this study.

7. The question on promotions and pay raises (Appendix C-1, question 18) should be modified to provide information as to the type and extent of the pay raises or promotions.

8. The graduate and employer specialized area questionnaires (Appendices C-2 to 5, and D-2 to 5) should be modified to gather data as to any additional training beyond the knowledges and abilities listed that are needed in the graduates' jobs.

9. Clearer explanation is needed in emphasizing to employers the importance of completing the specialized questionnaires, even though the graduate is not employed in the area for which training was received.

CONCLUSIONS AND IMPLICATIONS

Conclusions

From the data analyzed, the following conclusions were drawn:

1. Approximately 4 out of 10 secondary agricultural graduates will be employed full-time within one month of graduation.

2. Approximately one-third of secondary agricultural graduates will continue on to further education, primarily in two-year colleges.

3. A higher percent of farm production and management graduates will enter college than will graduates in the other specialized areas. This may be because the farm production and management program has been established for a long period of time and therefore is better accepted by college bound students. Another reason may be that more farm production and management programs are offered in local schools, than are programs in the other specialized areas, where they can be scheduled by students taking a college preparatory course. Another casual factor may be that graduates of area vocational centers, where a majority of the conservation, agricultural mechanication, and ornamental horticulture programs are offered, were selected for enrollment on the basis of lower academic interest and/or ability, and vocational plans for employment following graduation.

4. Approximately one-half of all employed secondary agricultural graduates will be employed the first year in the area of agricultural specialization for which they were trained. This may reflect a shortage of entry level jobs and/or a need for improved job placement procedures, especially in the areas of conservation, agricultural mechanization, and ornamental horticulture where a maximum of 40 percent of the graduates were employed in the area for which they had received

training.

5. Farm production and management graduates are more likely to enter the area for which they were trained (i.e. farming) than are graduates of the other specialized areas. This may be due to actual farm work experience leading to a more mature vocational choice, equity acquired in farming leading to opportunity for self-employment, and/or opportunity for employment on the family farm.

6. Farm production and management graduates tend to have more firmly established vocational goals than do graduates of conservation, agricultural mechanization, or ornamental horticulture. This is indicated by the percent of farm production and management graduates employed in farming and listing farming as their future occupational plans.

7. The larger percentage of conservation graduates entering military service may be due to less mature vocational choice and/or lack of employment opportunities.

8. First year jobs of secondary agricultural graduates will be employed in a wide range of job titles.

9. Almost all secondary agricultural graduates seeking employment are employed within less than one month following graduation.

10. Most New York secondary agricultural graduates use informal job seek methods the first year.

11. Almost all New York secondary agricultural graduates are qualified for their first year jobs.

12. At least one-fourth of New York State secondary agricultural graduates will need additional training for their first year job. This is evidenced by the 25 percent of the 1968 graduates' employers providing

additional training the first year.

13. Most New York State secondary agricultural graduates progress in their jobs the first year as evidenced by over half of employed graduates receiving some kind of promotion or pay raise.

14. Most farm production and management knowledges and abilities are highly needed in the first year jobs held by farm production and management graduates. A majority of the knowledges and abilities in conservation, agricultural mechanization, and ornamental horticulture are not needed in the first year jobs of graduates of the respective areas. This is expected since a considerably higher percent of farm production and management graduates were employed in the area they were trained for than were graduates of the other specialized areas of agriculture.

15. Almost all the training received by New York State secondary agricultural graduates for knowledges and abilities needed in their first year jobs were "adequate" to "superior." This indicates a general satisfaction by graduates with the training received that was needed in their jobs.

16. There is a general, high priority need for positive job attitudes and habits in the first year jobs of New York State secondary agricultural graduates. This indicates the importance of teaching the affective domain in occupational education in agriculture.

17. There are considerable differences between the perceptions of New York State secondary agricultural graduates and their employers as to the need for agricultural knowledges and abilities in the graduates' jobs. These differences are reflected in the employers' higher rating of the need for positive job attitudes and habits, and the overall

lower ratings by employers for the other knowledges and abilities. There were also differences between graduates and employers in the relative ranking of individual knowledges and abilities.

18. A large percent of New York State agricultural graduates do not receive training in the same specialized area of agriculture in both their junior and senior years. This is evidenced by the low percent of 1968 graduates meeting this criteria for inclusion in the study as compared with the total New York State agricultural enrollment in grades 11 and 12. This may be due to the number of new programs, enrollment limitations, and/or organization changes in occupational education offered by Boards of Cooperative Education Services (BOCES).

19. New York State teachers of agriculture are using the New York State Education Department guides for planning and organizing occupational programs in agriculture. This is evidenced by the high percent of employed graduates responding that "training had been received" for the knowledges and abilities drawn from the New York State Education Department guides.

20. Most first year secondary agricultural graduates have a positive image of farming and a somewhat higher positive image of off-farm related agricultural industry.

21. Secondary agricultural graduates are generally satisfied with their jobs. Most negative first year job satisfaction will be by conservation and agricultural mechanization graduates with promotions available, and pay received.

22. There is no statistically significant relationship between a graduate's image of agriculture and his job satisfaction.

23. The procedural follow-up model developed in this study is

useful for providing follow-up data on occupational education graduates. The needed changes listed for the model should be incorporated.

Implications

The following recommendations and implications for further study are made from the findings and conclusions:

1. Follow-up of graduates should continue over a period of years to determine the continuing occupational patterns.

2. Increased and continued cooperation is needed between secondary school personnel and employers concerned with occupational education in agriculture to identify the agricultural knowledges and abilities that are needed by graduates for employment.

3. Secondary agricultural graduates were employed the first year in a broad range of jobs. Task analysis research is needed to identify the agricultural tasks performed.

4. Research is needed to determine the comparative validity of graduate and employer ratings as to the need for agricultural knowledges and abilities in jobs.

5. Research is needed to determine the relative efficiency of in-school versus directed work experience educational settings for teaching needed agricultural knowledges and abilities.

6. The secondary occupational education in agriculture curriculum should increase emphasis on teaching job search skills.

7. The secondary curriculum in occupational education in agriculture should continue to include, at an increased level of emphasis, training for positive job attitudes and habits.

8. Research should be conducted to determine the reasons for the extensive student mobility between the specialized areas of

occupational education in agriculture.

9. Additional research is needed to identify the differences between occupational education programs offered by local schools and those programs offered by Boards of Cooperative Educational Services (BOCES).

10. There is a need for research to determine the reasons for the differences between graduates in the time required to find employment following graduation.

11. The one-year procedural model developed in this study should be changed to incorporate the needed modifications indicated and tested through further use.

SUMMARY

Objectives

The objectives of the study were to gather occupational follow up data from secondary agricultural graduates and their employers as a basis for evaluation of occupational education programs. The secondary objective was to develop a procedural follow up model.

Method

Self-administered questionnaires were used to gather data as to occupational status, relevance of training agricultural images, and job satisfaction. Respondents were all 1968 New York State secondary agricultural graduates who had completed two years of the same agricultural specialized area (farm production and management, conservation, agricultural mechanization, and ornamental horticulture), and their employers. Secondary school personnel assisted in providing lists of graduates and in follow-up. The questionnaires return averaged 61 percent.

Findings, Conclusions and Implications

1. Forty-one percent of graduates were quickly employed, 30 percent entered college and 1 percent took other postsecondary training, 27 percent entered military service and 1 percent was unemployed.

2. Fifty-three percent of all employed graduates worked in the area they were trained for. The range was 63 percent for farm production and management graduates, and 30-40 percent for graduates of the other areas.

3. Graduates found first year employment in a wide range of jobs, primarily through use of informal job seek methods.

4. Graduates received adequate training for the agricultural knowledges and abilities needed in their jobs.

5. The need for most agricultural knowledges and abilities in graduates' jobs was related to the percent of graduates working in the specialized area for which training was received. Positive job attitudes and habits were needed in almost all jobs.

6. Almost all employed graduates were qualified for their job.

7. Most graduates have a positive image of farming and a slightly higher positive image of off-farm related agricultural industry.

8. Graduates are generally satisfied with their jobs. Satisfaction was lowest for promotions available and pay received.

9. No significant relationship was found between graduates' image of agriculture and job satisfaction.

10. Further research is recommended to determine the reasons for student mobility between the specialized areas of agricultural training, and the differences between agricultural education offered by local schools and Boards of Cooperative Educational Services.

11. Cooperation with advisory groups and task analysis of jobs is necessary to identify agricultural knowledges and abilities needed by graduates.

12. Increased curricular emphasis should be given to job seek skills, and positive job attitudes and habits.

13. The study should be continued to identify continuing occupational patterns and to refine the procedural model.

SELECTED BIBLIOGRAPHY

PUBLIC DOCUMENTS

The University of the State of New York, The State Education Department, Bureau of Secondary Curriculum Development. Conservation, A Guide for Planning and Organizing Occupational Programs, 1968.

_____. Farm Production and Management, A Guide for Planning and Organizing Occupational Programs, 1969.

_____. Ornamental Horticulture, A Plan for Organizing and Planning Occupational Programs, 1968.

U.S. Department of Labor, Manpower Administration, Bureau of Employment Security, Dictionary of Occupational Titles - Definitions of Titles. Vol. I, Third Edition, 1965.

_____. Dictionary of Occupational Titles - Occupational Classification. Vol. II, Third Edition, 1965.

U.S. Bureau of Budget, Executive Office of the President. Standard Industrial Classification Manual, 1967.

UNPUBLISHED MATERIAL

Hulin, C.L., et.al., "Cornell Studies of Job Satisfaction; II, Model and Method of Measuring Job Satisfaction," Research Study conducted at Cornell University, Ithaca, New York, 1966, (In Press).

The University of the State of New York, The State Education Department, Bureau of Agricultural Education. "A Guide for Developing a Course of Study for Agricultural Mechanization 3 & 4." Albany, June, 1965. (Mimeographed)

BOOKS

Baer, Max F., and Edward C. Roeber, Occupational Information, Its Nature and Use. Chicago: Science Research Association, Inc., 1951.

Turabian, Kate L. A Manual of Study for Writing of Term Papers, Theses, and Dissertations. Chicago: University of Chicago Press, 1955.