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

ED 021 062 08 VT 004 931

AN IN-DEPTH STUDY TO ASCERTAIN WHETHER THERE IS A NEED IN THE STATE OF UTAH FOR A POST HIGH SCHOOL PROGRAM IN ORNAMENTAL HORTICULTURE.

BY- DIRKSEN, DENNIS A.
UTAH RESEARCH COORD. UNIT FOR VOCAT.AND TECH.EDUC.

REPORT NUMBER BR-6-3046 PUB DATE 67
GRANT OEG-4-7-063046-1612
EDRS PRICE MF-$0.50 HC-$2.60 63P.

DESCRIPTORS- *ORNAMENTAL HORTICULTURE OCCUPATION, *OCCUPATIONAL SURVEYS, WAGES, AGE, *EDUCATIONAL NEEDS, *EMPLOYMENT QUALIFICATIONS, EDUCATIONAL PROGRAMS, NURSERY WORKERS (HORTICULTURE), GROUNDS KEEPERS, *EMPLOYMENT OPPORTUNITIES, FEASIBILITY STUDIES, POST SECONDARY EDUCATION, UTAH,

THE OBJECTIVES OF THE STUDY WERE TO DETERMINE (1) KINDS OF JOBS AND NUMBER OF PEOPLE ASSOCIATED WITH ORNAMENTAL HORTICULTURE IN UTAH, (2) SKILLS AND INFORMATION NEEDED BY NURSERY WORKERS, (3) TRAINING PROGRAMS ALREADY ESTABLISHED IN THE NATION, (4) NEEDS OF GOLF COURSES, AND (5) THE USE OF DATA IN DEVELOPING A TRAINING PROGRAM. QUESTIONNAIRES WERE SENT TO ALL NURSERIES AND GOLF COURSES IN THE STATE, AND RESPONSES WERE OBTAINED FROM 64.6 PERCENT OF THE NURSERIES AND 65.3 PERCENT OF THE GOLF COURSES. A SHORTAGE OF WELL-QUALIFIED WORKERS WAS REPORTED BY 92.8 PERCENT OF THE RESPONDENTS. MOST NURSERYMEN LEARNED BY BEING SELF-TAUGHT OR BY ON-JOB EXPERIENCE. SEASONAL WORKERS WERE STUDENTS. WAGES RANGED FROM $150 TO $450 PER MONTH. OF 171 PREDICTED JOBS BY 1972, 119 WERE OF A SEMI-SKILLED CLASSIFICATION OR LESS. NURSERYMEN PROVIDED ON-THE-JOB TRAINING FOR SEASONAL WORKERS AND USED THE EMPLOYMENT CRITERIA OF HONESTY, WILLINGNESS TO WORK, DEPENDABILITY, AND KNOWLEDGE OF THE BUSINESS. MOST EMPLOYEES WERE IN THE 16-20 OR 61-65 AGE RANGES. GOLF COURSE PROFESSIONALS DEEMED KNOWLEDGE OF GRASSES, SOILS, AND COURSE CONSTRUCTION AS NECESSARY FOR GOLF COURSE EMPLOYEES. LITTLE JUSTIFICATION WAS FOUND FOR A POST-HIGH SCHOOL ORNAMENTAL HORTICULTURE PROGRAM IN UTAH, BUT ORNAMENTAL HORTICULTURE UNITS IN HIGH SCHOOL VOCATIONAL AGRICULTURE WERE NEEDED. (JM)

AN IN-DEPTH STUDY TO ASCERTAIN WHETHER THERE IS A NEED IN THE STATE OF UTAH FOR A POST HIGH SCHOOL PROGRAM IN ORNAMENTAL HORTICULTURE

FINAL REPORT

PA-08

BR-6-3046

OEG-4-7-063046-1612

OFFICE OF THE STATE SUPERINTENDENT OF PUBLIC INSTRUCTION

Produced by the Utah Research Coordinating Unit
for Vocational and Technical Education

1967

AN IN-DEPTH STUDY TO ASCERTAIN WHETHER THERE IS A NEED IN THE STATE OF UTAH FOR A POST HIGH SCHOOL PROGRAM IN ORNAMENTAL HORTICULTURE

OFFICE OF THE STATE SUPERINTENDENT OF PUBLIC INSTRUCTION

Produced by the Utah Research Coordinating Unit
for Vocational and Technical Education

Project Director--Dr. Austin G. Loveless
Associate Director, Research Coordinating Unit
Professor, Industrial & Technical Education
Utah State University

Principal Investigator--Mr. Dennis A. Dirksen
Research Assistant
Industrial & Technical Education
Utah State University

1967

TABLE OF CONTENTS

LIST OF TABLES

SUMMARY

The purpose of this study was twofold: (1) To make a job analysis of the ornamental horticulture industry based on the needs of Utah. (2) To ascertain whether or not there is a need to offer formal training on the post high school level for the workers in the nursery industries in the state of Utah. Literature was reviewed, and a questionnaire was developed and sent to each nursery establishment in the state. A survey was also conducted of all the golf course professionals in the state to ascertain their needs.

Forty-two, or 64.6 per cent of the nurseries and 23, or 65.3 per cent of the golf course professionals returned their questionnaires. A summary of the findings follows:

1. A shortage of well-qualified workers exists in the industry according to 92.8 per cent of the respondents.

2. Most of the nurserymen learned the trade by being self-taught or by on-the-job experience.

3. The predominant source of seasonal workers was students who worked only during the summer and returned to school in the fall.

4. The wages paid nursery workers ranged from a low of $150 a month for an inexperienced high school student to $450 a month for a person who had some exposure in the business.

5. Peterson predicted a total increase of 171 in the work force in the next five years. One hundred nineteen of the 171 predicted jobs are of a semi-skilled classification or less.

6. Most employers provide on-the-job training for their seasonal workers.

7. The nurserymen have to train new help each year since not all workers return the following year.

8. As with many other establishments, nurserymen reported using

the following criteria for the employment of workers: honesty, willingness to work, dependability and knowledge of the business.

9. Most of the employees are in the 16-20 or 61-65 age groups.

10. At least three-fourths of the businesses employ women in various capacities but mainly as sales clerks.

11. The nurserymen, because of the variety of types of enterprises, did not agree fully on what the worker must know, what was nice to know but not necessary, and what was unnecessary to know to succeed in the industry.

12. Only a fourth of the respondents indicated that they needed one or more golf course superintendents.

13. The one trait deemed necessary most often by the golf course professionals was that of having knowledge of grasses, soils, and course construction.

IMPLICATIONS AND RECOMMENDATIONS

Most persons entering employment in the nurseries of Utah in the immediate future are likely to have little education beyond the secondary school level. Because of the limited number of persons involved in full-time work in nurseries in the state of Utah and because of the result of the survey, the following is the only recommendation that can be made at this time: an increased urgency to establish units on ornamental horticulture as part of the vocational agriculture department in the secondary schools so as to expose the student to the possibilities of the nursery industry.

Unless the state of Utah is willing to train people from out of state, there appears to be little justification to set up a post-high school program in ornamental horticulture at this time.

Chapter I

STATEMENT OF THE PROBLEM

The state of Utah, like many other states, is part of the expanding services of the nursery or ornamental horticulture industry. The reasons for the expanded services have come about because: (1) more money is available so that people can afford more and better landscaping around their homes; (2) more and more emphasis is being placed on the aesthetic values of the outdoor spaces around homes, commercial buildings and public places; (3) Mrs. Lyndon Johnson, through her beautification legislation, has caused the nation to become conscious of its beautification needs; (4) roadways are being planted for safety and appearance; and (5) there is an increase of leisure time when people can enjoy the out-of-doors.

While people are aware of the increased activities of the ornamental horticulture business, the problem of identifying the skills and related information that the nursery worker needs to know is either non-existent or extremely limited. There have been a number of studies completed and reports written on what the total program should consist of for top management in the nursery industry, but it appears that very little attention has been given to what the nursery worker should know.

Like many other states, Utah's main emphasis in the area of ornamental horticulture has been with the vocational agriculture teacher who has introducted a unit into the high school vocational agriculture curriculum.

The problem of whether a need exists to offer formal training on a short term basis for workers in the nursery industry on the post-high school level is a question that this study will attempt to answer.

PURPOSE OF THE STUDY

The purpose of this study was twofold: (1) To make a job analysis of the ornamental horticulture industry based on the needs of Utah. (2) To ascertain whether or not there is a need to offer formal training on the post high school level for the workers in the nursery industries in the state of Utah. Specifically this study will try to answer the following questions:

1. What types of jobs and how many people are associated with the ornamental horticulture industry in the state of Utah?
2. What skills and related information must the nursery worker possess to be an effective employee?
3. What programs have been established in the United States for the training of nursery workers?
4. What are the needs of the golf courses in regards to turf and greens maintenance in the state of Utah?
5. How can the above factors be used in the development of a formal training program in ornamental horticulture?

PROCEDURE

Information for this study was obtained from five major sources: (1) A questionnaire which was developed to give a profile of the nursery industry in regard to the following information: how the present owner received his training, number of present employees, need for qualified workers, and what skills and related information a nursery worker should know; (2) a review of literature pertaining to the nursery industry and its needs; (3) a survey of programs in ornamental horticulture that are in operation in various parts of the nation; (4) a survey which was sent to all the golf courses in the state of Utah to ascertain their needs; and (5) a report compiled by Paul Peterson.

The complete listing of the 1967 licensed nursery establishments,

as published by the Utah State Department of Agriculture, was used in identifying the firms to which the questionnaires were to be sent. A similar list published by the Utah Golf Association was used to identify the total population of golf courses in the state of Utah.

DEFINITION OF TERMS

Technical Worker - A semi-professional highly skilled worker whose educational preparation is typically more rigorous and theoretical than that of the craftsmen and more specialized and applied than that of the professional. (White, 1967).

Occupational Cluster - An occupational cluster is a group of closely related jobs having common or very similar characteristics.

Ornamental Horticulture - That area of goods and services in horticulture dealing primarily with plant materials used in home and commercial or institutional beautification. This area encompasses all aspects of horticulture from landscape design to repair or maintenance but excluding production or services involving edible horticulture products except as used for beautification.

Nursery Worker - A skilled or semi-skilled worker whose main purpose is to carry out the plans and planting contracts the nursery accepts plus helping around the business in various ways such as order fillers, salesman, landscape helper, etc.

Chapter II

REVIEW OF LITERATURE

Programs to educate various levels of workers are increasing in number, size, and variety as needs are identified and leadership emerges. The ornamental horticulture industry is expanding and educators have observed this expansion and are setting up programs to train the highly technical workers and/or owners of such businesses. There are a number of examples of proposed and/or established curriculum guides available for programs in ornamental horticulture. To review several of these would help to give direction as to what type of program is feasible in the state of Utah.

Probably the most meaningful study and the one that will have the most direct and lasting effect on what a program of ornamental horticulture will consist of is the curriculum guide that is being produced by the State University Agricultural and Technical College at Farmingdale, New York, pursuant to a contract with the United States Office of Education. The draft of the curriculum guide was released in February, 1967, for discussion purposes only and it is presently being reworked for issuance in the very near future. It should be noted, however, that this curriculum guide is complete and approaches the curriculum from the cluster concept in which knowledge basic to a family of jobs has been identified. This common body of knowledge is the basis for all of those enrolled in the ornamental horticulture curriculum. When a person chooses his specialty, he merely adds those courses which are necessary to fulfill his objective. It is impossible to quote from the guide at this time, but when it is officially released, it will certainly give impetus to the ornamental horticulture curriculum.

Another study was completed in 1967 by White at The Ohio State University. White's two primary purposes were to determine occupational opportunities for highly skilled technical workers and to ascertain what type of curriculum should be established for these employees or prospective owners of such businesses in the state of Ohio. This study was highly in favor of training technical workers and did not dwell long on the seasonal laborer who is critically needed to carry out the ideas and directions of the technically trained staff. White states that in Ohio technical level employees constituted 7.7 per cent of the full-time labor force. The full-time employment was only 47 per cent of the total. (White, 1967, p. 98-102). The study revealed that the greatest number of reported full-time employees were engaged at the semi-skilled occupational level. The unskilled and semi-skilled levels comprised almost 90 per cent of the part-time employment. White observed that very few part-time employees were of technical level or higher. The study did an excellent job in identifying curriculum content for the technical worker but no information was reported as to how the industry is getting their seasonal and full-time semi-skilled workers.

A third study completed at Louisiana State University in 1966 dealt with a cluster concept for a training program for vocational agriculture in ornamental horticulture. A team approach was used to develop the training program content. The curriculum they proposed was suggested for high school vocational agriculture programs. The interesting part of the study is the various units they suggest as being appropriate for the student to take for training in ornamental horticulture. Following are the units and lessons that the team suggested for a curriculum in ornamental horticulture.

UNIT I. SELECTION, CARE, OPERATION, AND MAINTENANCE OF SMALL ENGINES AND EQUIPMENT
- Lesson 1. Selection of Small Gasoline Engines and Equipment
- Lesson 2. Operation, Care, and Maintenance of Small Gasoline Engines and Equipment

UNIT II. CONSTRUCTING, MAINTAINING AND USING PLANT GROWING STRUCTURES
- Lesson 1. Identifying Various Types of Plant Growing Structures
- Lesson 2. Maintaining Plant Growing Structures

UNIT III. USING AND CARING FOR ORNAMENTAL PLANTS, MATERIALS, AND LANDSCAPE STRUCTURES
- Lesson 1. Caring for and Protecting Wounded and Damaged Plants
- Lesson 2. Making Use of Materials for Landscape Structures

UNIT IV. LANDSCAPE DESIGN
- Lesson 1. Landscape Designs
- Lesson 2. Selection of Plants for Design
- Lesson 3. Planting of Plants Needed in Landscape Design
- Lesson 4. Maintenance of Plants in the Landscape Design

UNIT V. IDENTIFICATION OF ORNAMENTAL PLANTS
- Lesson 1. Plant Vocabulary and Botanical Names
- Lesson 2. Identification of Plants by Physical Appearance, Growth Habits, and Plant Keys

UNIT VI. PROPAGATING HORTICULTURAL PLANTS
- Lesson 1. Producing Plants from Seeds
- Lesson 2. Producing Plants from Cuttings
- Lesson 3. Producing Plants by Layerage
- Lesson 4. Budding and Grafting as Methods of Plant Propagation
- Lesson 5. Constructing and Using Equipment Required of Plant Propagation

UNIT VII. GROWING HORTICULTURAL PLANTS
- Lesson 1. Controlling the Environmental Factors Affecting Plant Growth
- Lesson 2. Planting Annuals and Transplanting Seedlings, Pot Plants, Perennials, Shrubs and Trees in the Landscape
- Lesson 3. Using Cultural Practices for Growing High Quality Plants

UNIT VIII. USING SOIL AND OTHER PLANT GROWING MEDIA EFFECTIVELY
- Lesson 1. Relation of Plant Watering Practices to Soil Structure
- Lesson 2. Recognition and Effective Use of Soil Conditioners
- Lesson 3. Soil Mulches

It can be seen from the topical outline that it is complete and could easily be adopted by a post-high school institution. Again, this program is geared more to the technician and owner/manager type training than to help the semi-skilled person who is employed either on a full or part time basis.

In the state of Utah several studies have been made as to the employment needs of off-the-farm agriculture type businesses. Schank (1964) identified over 780 jobs in the field of ornamental horticulture in the South Davis and Salt Lake counties and predicted an increase of 142 new jobs in the next five years. The study also revealed that monthly wages ranged from $150 for an inexperienced high school student to $450 for one who had had some exposure in the business. Stephens (1966), in a study that encompassed the Ogden, Utah, area, indicated that there was a need for more training in the area of ornamental horticulture. Olsen (1965) concluded that ornamental horticulture accounts for slightly over seven per cent of the off-farm agricultural occupations in North Davis, Weber and Morgan counties in Utah.

The most recent report that has been compiled was completed in the summer of 1967 by Paul Peterson. The emphasis of his research was to determine the need for a technician type program in ornamental horticulture at the post-high school level in Davis, Salt Lake and Utah counties. Peterson indicates in the review of literature that there is very little material written concerning the competencies needed by employees in ornamental horticulture. There appears to be no justification for this lack of information. As was noted previously, the education for technical workers of the industry has received extensive attention but that of the semi-skilled and non-skilled who make up the majority of the work force

of the industry has not received the attention it should.

Peterson (1967) surveyed the three counties in Utah that have the highest population density in the state and compiled the statistics for each county separately and collectively according to job titles, number employed, level of employment, and the anticipated increase in the number of employees for each job title during the next five years. The following is Table 3 of Peterson's report.

Table 3. Existing and future employment opportunity trends in Davis, Salt Lake, and Utah counties as of 1967

Job Title	Davis County			Salt Lake County			Utah County			Total of all three counties			Level of Employment
	Number Employed	Part-time	5 years hence	Number Employed	Part-time	5 years hence	Number Employed	Part-time	5 years hence	Number Employed	Part-time	5 years hence	
Business Manager	0	0	0	2	0	1	0	0	0	2	0	1	3
Assistant Manager	10	0	1	12	0	1	7	0	0	29	0	2	3
Clerk	7	0	0	22	0	10	10	0	0	39	0	10	4
Driver	2	2	0	30	10	0	3	0	0	35	12	0	7
Flcor Foreman	0	0	0	2	0	0	0	0	0	2	0	0	4
Floral Designer	10	0	5	19	6	10	11	0	5	40	6	20	6
Florist	0	0	0	4	0	0	0	0	0	4	0	0	2

Table 3. Continued

Job Title	Davis County			Salt Lake County			Utah County			Total of all three counties			Level of Employment
	Number Employed	Part-time	5 years hence	Number Employed	Part-time	5 years hence	Number Employed	Part-time	5 years hence	Number Employed	Part-time	5 years hence	
Greenhouse Worker	50	20	10	30	23	23	15	0	8	95	43	41	7
Grower	5	0	2	5	0	2	2	0	3	12	0	7	6
Landscape Architect	4	0	0	7	0	3	5	0	3	16	0	3	1
Landscape Foreman	5	0	2	16	3	4	4	0	3	25	3	9	2
Landscape Helpers	10	7	6	60	32	15	8	8	8	78	47	29	7
Manager	6	0	0	17	0	0	8	0	0	31	0	0	3
Nurseryman	5	0	0	16	0	5	5	0	1	26	0	6	2

Table 3. Continued

Job Title	Davis County			Salt Lake County			Utah County			Total of all three counties			Level of Employment
	Number Employed	Part-time	5 years hence	Number Employed	Part-time	5 years hence	Number Employed	Part-time	5 years hence	Number Employed	Part-time	5 years hence	
Nursery Technician	0	0	0	3	0	0	0	0	0	3	0	0	2
Nursery Worker	27	20	3	325	303	25	32	31	5	384	354	33	7
Order Fillers	0	0	0	7	0	0	0	0	0	7	0	0	5
Propagators	0	0	0	3	0	2	0	0	0	3	0	2	6
Small Engine Repairman	0	0	1	5	3	2	1	0	0	6	3	3	6
Salesman	8	0	0	40	6	1	5	0	1	53	6	2	4
Installer of Sprinklers	1	0	1	5	0	0	2	0	0	8	0	1	2
Total by Counties	150	49	30	630	386	104	118	38	37	898	473	171	

The data indicate that there is a predicated increase of 171 in the work force in the ornamental horticulture industry for the next five years or approximately thirty-five per year. In interpreting the data it would appear that 119 of the 171 predicated jobs are of a semi-skilled classification or less and only 52 of a technical nature.

The question that arises from the above study is just what type of knowledge and skills do the skilled and semi-skilled employees who are employed in the field of ornamental horticulture on a part-time or full-time basis need to know and how best can the individual receive the skills and information. The following chapter will attempt to answer this question.

Chapter III

PRESENTATION OF DATA

The data for this study were obtained through the use of a questionnaire. By a thorough analysis of trade journals, previous studies and professional books, key skills were identified and compiled for the questionnaire. The questionnaire was sent to seventy nursery establishments in the state of Utah as identified by the Utah State Department of Agriculture license list. Five recipients of the questionnaire returned them unanswered and stated that their operations were more a hobby than a business and therefore felt that any answers they would give would not be valid. After the initial mailing, two follow-up instruments were used. The first follow-up was made one week after the initial mailing of the questionnaires with the second follow-up coming one week later. Forty-two or 64.6 per cent of the questionnaires were returned for analysis for the purposes of this study.

The study revealed that thirty-nine of the forty-two respondents or 92.8 per cent indicated that there exists a shortage of well-qualified workers (See Table 1).

Table 1. Number and percentage of nurseries reporting the need of well-qualified workers in the nursery industry

Number Reporting	Number Reporting Yes	Number Reporting No	Per Cent Reporting Yes
42	39	3	92.8

In pursuing what the operators of the various nurseries meant by the term well-qualified workers, the respondents were asked to list those qualifications which they look for in a prospective employee. Honesty, dependability, will to work, and knowledge of business were the four qualities mentioned most often as shown by Table 2.

Table 2. The qualifications desired by the employers of their employees

Qualification	Number reporting the need for each qualification
Honesty	15
Willing to work	10
Dependable	10
Knowledge of business	10
Personal cleanliness	6
Ability to carry out orders	5
Interest	5
Pleasant personality	5
Experience	4
Physical ability	4
Desire to learn and to work	3
Get along with people	2
Can follow directions	2
Able to think for himself	2
Initiative	2
Educational background	2
Public relations	2
Salesmanship	1
Good moral standards	1
Good character and habits N/S N/D	1
Right handed	1

It is not totally clear what the respondents meant by the term "knowledge of business." In analyzing the total responses of all the questionnaires it would appear that the connotation they gave the term was to know the total operation -- from planting to selling.

In order for change to take place, some facts regarding the existing nursery industry need to be known. Using the information that Peterson (1967) and White (1967) compiled as background information, this study attempted to identify further the types of ownerships, how these owners or managers obtained their education, the rate of growth according to new establishments in the state of Utah and the employment trends according to seasonal versus the year-round work force.

According to the year that the nursery was established, organization of the returned inquiries showed that the largest increase happened during the 1950's. There has been a steady increase of this type of a business but it has not been significant as is shown by Table 3.

Table 3. Number and year in which nurseries have been established in the state of Utah

Year Nursery was Established	Number of Nurseries Established in that Period
1900-1910	3
1911-1920	2
1921-1930	3
1931-1940	5
1941-1950	8
1951-1960	16
1961-1967	5

Each inquiry showed the age of the proprietor and the years engaged in this type of work (See Table 4 and 5). This information was felt to be of importance for it would show more clearly the length of time it takes to receive the payoff from the schooling and/or increased practical experience. It should be noted that there were no proprietors less than 30 years

old with the mean age being 52.1. The average length of time that a person had been engaged in this type of work was 21.2 years with a range of those just beginning in the profession to two individuals that had career spans of nearly fifty years each.

Table 4. The age of the owner or manager*

Age of the proprietor	Number in each age group
30-35	6
36-40	5
41-45	6
46-50	10
51-55	6
56-60	5
61-65	4
66-70	3

*Does not add up to 42 as some questionnaires reported the age of each of the partners in business

Table 5. Number of years engaged in the nursery business

Years engaged in the nursery business	Number engaged for that length of time
0-5	3
6-10	7
11-15	4
16-20	10
21-25	5
26-30	5
31-35	1
36-40	2
41-45	3
46-50	2

The study revealed that 52.4 per cent of the nursery establishments are individually owned with 38.1 per cent indicating corporate type ownership (See Table 6). It is not shown on the tables, but an examination of the replies showed that the largest employers were the corporation type nurseries and that the individually owned nurseries relied heavily upon the family to provide help in the operation of the nursery establishment.

Table 6. Type of ownership

Number Reporting	Corporation Type Ownership		Partnership Type Ownership		Individual Type Ownership	
	Number	Per Cent	Number	Per Cent	Number	Per Cent
42	16	38.1	4	9.5	22	52.4

In analyzing the completed questionnaires according to how the present management received the training and skills necessary for a success in the nursery industry, it was revealed that twenty-nine were self-taught, twenty learned the trade from on-the-job experiences, and nineteen attended formal school (See Table 7).

One problem that the nursery industry is concerned about is the seasonal aspect of its operations. In an attempt to get a clearer picture of the problem, the recipients of the questionnaire were asked to indicate their employment profile. Table 8 shows that the area total of 225 seasonal employees compared to 175 full-time year-round staff or a drop in the work force of 225 during slack season.

An attempt was made to discover what the seasonal workers did in

Table 7. The means by which the present management learned the trade

Means by which the skills were obtained	Number which indicated each means of learning the trade
Self-taught	29
On-the-job training	22
Formal school	19
Correspondence schools	10
Agricultural background	6
Father-to-son	6
Previous owner	1
From experienced help	1
Other nurserymen and florists	1
School of hard knocks	1

Table 8. Employment profile

Peak Employment		Low Employment		Total Decrease	
On Salary	On Hourly Wage	On Salary	On Hourly Wage	On Salary	On Hourly Wage
115	285	75	100	40	185

off season. It was felt that this information might give some clues as to where the present seasonal employee is coming from. The predominant source of seasonal employees was students who worked only during the summer months and then returned to their schooling in the fall (See Table 9, page 20). One nurseryman stated that "the best worker I ever had was a high school student working part time." The tables do not indicate this but nearly all the seasonal work generally begins before school lets out in the spring and extends into the fall or the beginning of school.

Table 10 data on page 20 indicate that five of the reporting nurserymen

have all of their seasonal workers return year after year, but ten reported that only approximately fifty per cent of their seasonal work force return. What is significant is that not all of the workers return the following year and that the nurserymen have to train new help each year and that they depend upon students to fill the needs of summer employment.

Table 9. The activity of seasonal workers during off season as reported by their employers

Activity	Number engaged in that activity
Return to school	20
Housewives	5
Return to teaching	4
Activity unknown	4
Work at home	2
Retired individuals	2
Odd jobs	1
Government work	1
Civil Service	1
Farm	1
Work at their full time job	1

Table 10. Number and per cent of the seasonal work force returning the following year*

Per cent of employees returning	Number reporting that many returning
90-100%	5
80-89	2
70-79	4
60-69	3
50-59	10
40-49	1
30-39	0
20-29	3
10-19	2
0-9	3

*Does not add to 42 as some respondents did not answer this item.

The replies on item four of the questionnaire, which inquired about the age of their employees, indicated a range of seventy years. Four reported that they employed youngsters 10-15 years of age and two reported that they had employees as old as 80 years of age (See Table 11 below). The two ages reported most often were in the 16-20 age bracket and the 61-65 years old.

Table 11. Number and ages of nursery employees

Ages of employees	Number reporting	
	Youngest age	Oldest age
10-15	4	0
16-20	17	0
21-25	3	2
26-30	4	0
31-35	1	0
36-40	0	1
41-45	0	3
46-50	0	2
51-55	0	3
56-60	0	3
61-65	0	9
66-70	0	2
71-75	0	1
76-80	0	2

Most training programs are primarily geared to the needs of the male population. In view of this, the study revealed that 83.3 per cent of those reporting employ women in various capacities as shown by Table 12, page 22. The job most often held by women was the sales clerk position (See Table 13).

One of the most difficult tasks faced by the employer is that of how to train his work force when there is the seasonal aspects of his industry

Table 12. Number and percentage of women employed in the nursery industry

Number Reporting	Number Reporting Yes	Number Reporting No	Per Cent Reporting Yes
42	35	7	83.3

Table 13. Type of jobs held by women in the nursery industry

Type of Job	Number holding each job
Sales Clerk	16
Transplanter	5
Secretary	5
Designer	5
Bookkeeper	3
Watering	2
Potting Plants	1
Weeding - Packing	1

and the rate of turnover among his employees. The answer to this problem is basic to the future of the nursery industry.

The study revealed that 90.4 per cent of nurseries today have on-the-job training for their workers. Two indicated that home-study was required and two stated that they had their new employees attend training schools provided by large industrial suppliers (See Table 14, page 23).

One problem that is often associated with scarcity of workers is the mechanization of the industry. Studies have indicated that there is a speed-up in mechanization when there is a scarcity of workers. This

Table 14. Training procedures for new employees

Type of Training Procedure	Number using each Procedure
On-the-job training	38
Home-study	2
Attend schools of large suppliers	2

does not seem to be the case in the nursery industry. Examination of Table 15 shows that in the last fifteen years twenty-two power driven machines have been added. The table does not show this but thirty-six or 85.7 per cent of the respondents indicated that the purchase of these machines had not affected the work force. One nurseryman stated that he added six power driven machines and also increased the number of employees.

Table 15. Number of power driven machines purchased in the last five years

Number of Machines	Number reporting purchasing power driven machines
0-2	7
3-4	5
5-6	7
7-8	1
9-10	1
11-12	0
13-14	0
15-16	1

In an attempt to get specific information about what skills and related information the nursery worker must have, a type of occupational

analysis was employed. Various trade journals, professional books, research studies and college and trade school catalogs were analyzed as a basis for identifying skills and related knowledge. The identified skills and related information items were then structured into statements. The recipients of the questionnaires were asked to respond to each item in one of three ways: (1) whether the worker they employed had to know that information, (2) whether it was not specifically necessary but would be helpful in the success of the employee, or (3) if it was not necessary to know the item. Fifty-four skills and related information items were identified.

Table 16, page 25, shows which knowledge items are deemed necessary to know as indicated by the largest percentage of respondents. The knowledge items checked most often were: know types of fertilizer and their uses for fertilizing trees, the establishing of lawns, and the identification of plants by their physical appearance. The respondents were quite consistent in identifying the knowledge items not necessary to know, as shown in Table 18, page 30. This consistency, however, was not evident in identifying the must know and the nice to know items. The reasons for this inconsistency are not totally clear but much of it can be attributed to the type of operation in which the nursery is involved.

"Knowing the theory of supervision" led the list of knowledge items deemed nice to know by the nurserymen of Utah, as shown in Table 17, page 27. There was, however, less agreement among the responses on this table as compared to Table 16.

Table 16. Knowledge items deemed necessary for performance of principal tasks by largest percentage of respondents

Knowledge Item	Must Know		Nice to Know		Not Necessary to Know	
	Number	Per Cent	Number	Per Cent	Number	Per Cent
Know types of fertilizer to use and procedures in fertilizing trees	34	81.0	6	14.3	2	4.7
Know how to establish a lawn by seeding and its maintenance	33	78.6	7	16.7	2	4.7
Know how to establish turf, re-establish it and maintain it	31	73.8	9	21.4	2	4.7
Know plants by physical appearance	31	73.8	9	21.4	2	4.7
Know how to communicate orally	29	69.1	13	30.9	0	0
Know plants by growth habits	28	66.7	12	28.6	2	4.7
Know plant disease identification and its control	27	64.3	13	31.0	2	4.7
Know fertilizer composition	25	59.5	15	35.7	2	4.7
Know uses of and how to establish bedding plants	25	59.5	13	31.0	4	9.5
Know theory and procedures for tree trimming and maintenance	25	59.5	13	31.0	4	9.5

Table 16. Continued

Knowledge Item	Must Know		Nice to Know		Not Necessary to Know	
	Number	Per Cent	Number	Per Cent	Number	Per Cent
Know types and uses for various soil conditioners	25	59.5	12	28.6	5	11.9
Know plant classification & identification	24	57.2	16	38.1	2	4.7
Know how heat and wind affect nursery stock	24	57.2	16	38.1	2	4.7
Know methods of salesmanship	24	57.2	16	38.1	2	4.7
Know planting, caring, and grading of container ground stock	24	57.2	13	31.0	5	11.9
Know soil conditions that affect plant growth	23	54.8	17	40.5	2	4.7
Know fertilizer uses and their reaction with soils and plants	23	54.8	17	40.5	2	4.7
Know how to deal with the problems of working with others	23	54.8	16	38.1	3	7.1
Know theory of cultivation*	20	47.6	20	47.6	2	4.7
Know procedures of record keeping and importance thereof	20	47.6	18	42.9	4	9.5
Know digging, balling, burlapping of nursery stock	20	47.6	14	33.3	8	19.1

*Also appears on Table 17

Table 17. Knowledge items deemed nice to know but not specifically necessary for performance of principal tasks by the largest percentage of respondents

Knowledge Item	Must Know		Nice to Know		Not Necessary to Know	
	Number	Per Cent	Number	Per Cent	Number	Per Cent
Know theory of supervision	10	23.8	30	71.4	2	4.7
Know how to care for and maintain tools and motorized equipment	9	21.4	27	64.3	6	14.3
Know how to landscape commercial areas	10	23.8	26	61.9	6	14.3
Know what type of plants to use for wind control	10	23.8	26	61.9	6	14.3
Know fundamentals of sketching or plotting and rendering a landscape design	9	21.4	26	61.9	7	16.7
Know importance of keeping abreast with marketing trends	12	28.6	24	57.2	6	14.3
Know how to use walks, drives, fences, patios, pools in the use of landscape livability	9	21.4	23	54.8	10	23.8
Know theory of plant adaptations	10	23.8	23	54.8	9	21.4
Know principles of operation, maintenance, tune-up of internal combustion engines	1	2.4	22	52.4	19	45.2
Know how to landscape public roadways	3	7.1	22	52.4	17	40.5

Table 17. Continued

Knowledge Item	Must Know		Nice to Know		Not Necessary to Know	
	Number	Per Cent	Number	Per Cent	Number	Per Cent
Know basic properties of the soil and how to test for them	9	21.4	22	52.4	11	26.2
Know how to supervise and organize group work gangs	10	23.8	22	52.4	10	23.8
Know how to harvest, store, and grade nursery stock	13	31.0	22	52.4	7	16.7
Know how to plant for wind control	9	21.4	21	50.0	12	28.6
Know drainage & irrigation principles	15	35.7	21	50.0	6	14.3
Know theory and procedure for highway planting	3	7.1	20	47.6	19	45.2
Know hiring practices of the nursery industry	6	14.3	20	47.6	16	38.1
Know bidding procedures	13	31.0	20	47.6	9	21.4
Know landscape principles and design	14	33.3	20	47.6	8	19.1
Know uses of & how to establish potted plants	15	35.7	20	47.6	7	16.7
Know how to use materials for oral presentations	17	40.5	20	47.6	5	11.9

Table 17. Continued

Knowledge Item	Must Know		Nice to Know		Not Necessary to Know	
	Number	Per Cent	Number	Per Cent	Number	Per Cent
Know identification and their control	18	42.9	20	47.6	4	9.5
Know the effects of direct and indirect light on nursery stock	18	42.9	20	47.6	4	9.5
Know theory of cultivation*1	20	47.6	20	47.6	2	4.7
Know how to write reports and letters	12	28.6	19	45.2	11	26.2
Know how to landscape home areas	17	40.5	19	45.2	6	14.3
Know theory of park design and operation*2	2	4.7	18	42.9	22	52.4
Know plant propagation from seeds, cuttings, layers, grafting and division of roots	11	26.2	18	42.9	13	31.0
Know procedures for greenhouse operations	12	28.6	18	42.9	12	28.6
Know and keep abreast with legislation as it affects the nursery industry	14	33.3	18	42.9	10	23.8
Know procedures for root and top pruning for nursery stock development	16	38.1	18	42.9	8	19.1

*1Also appears on Table 16.
*2Also appears on Table 18.

Table 18. Knowledge items deemed unnecessary to know for performance of principal tasks according to largest per cent of respondents

Knowledge Item	Must Know		Nice to Know		Not Necessary to Know	
	Number	Per Cent	Number	Per Cent	Number	Per Cent
Know theory of park design and operation*[3]	2	4.7	18	42.9	22	52.4
Know uses of and how to establish vegetables	4	9.5	17	40.5	21	50.0
Know laws on taxes, insurance, retirement, wages, and social security	6	14.3	17	40.5	19	45.2

*[3]Also appears on Table 17.

Nurserymen were almost in total agreement that if a curriculum was set up that covered the knowledge items as checked they would hire the student taking the program. As shown in Table 19, 95.2 per cent stated that they would hire a student taking the program. The willingness of the nurserymen to hire students knowing the knowledge items as listed is one indication that the nurserymen are interested in letting the schools handle some of the training of their workers.

Table 19. Number and per cent of nurserymen reporting a willingness to employ trained workers

Number Reporting	Number Reporting Yes	Number Reporting No	Per Cent Reporting Yes
42	40	2	95.2

In setting up programs, one of the keys to success is whether or not a functioning advisory committee has been established. Each of the recipients of the questionnaire was asked whether he would be willing to serve on a committee which would be advisory in nature for purposes of setting up a program in ornamental horticulture. Twenty-five or 59.5 per cent indicated they would be willing to serve on such an advisory committee as reported in Table 20.

One of the problems of setting up a curriculum in ornamental horticulture is the difficulty of getting teachers. Because the nursery industry would have direct benefit from such a program, each of the nurserymen was asked whether he would be willing to teach within the boundaries

Table 20. Number and per cent of nurserymen reporting a willingness to serve on an advisory committee on ornamental horticulture

Number Reporting	Number Reporting Yes	Number Reporting No	Number Reporting No Answer	Per Cent Reporting Yes
42	25	13	4	59.5

of the term ornamental horticulture and specify what he felt he was qualified to teach. Table 21 shows that fourteen or 33.3 per cent of the respondents would be willing to teach.

Table 21. Number and per cent of nurserymen reporting a willingness to teach classes in ornamental horticulture

Number Reporting	Number Reporting Yes	Number Reporting No	Number Not Reporting	Per Cent Reporting Yes
42	14	24	4	33.3

Fourteen who answered that they would be willing to teach listed the following areas in which they felt most qualified:

1. Bedding plant production
2. Garden Center Management
3. Retail merchandising
4. Landscape design
5. Home landscaping
6. Plant propagation

7. Lawn planting and maintenance
8. Rock gardens and sprinkler systems
9. Ornamental floriculture
10. Production of nursery stock

An attempt was made to ascertain whether there was a common understanding when the term ornamental horticulture was used. Using the definition as published by the Dictionary of Occupational Titles for a base, the nurserymen were asked whether they agreed with the definition or not and if they did not, what would they change. Twenty-six or 61.9 per cent agreed with the definition. Eleven respondents did not react to the question and five disagreed (See Table 22).

Table 22. Number and per cent of nurserymen in agreement with the Dictionary of Occupational Titles definition of ornamental horticulture

Number Reporting	Number Agreeing with Definition	Number Disagreeing with Definition	Number Not Answering the Item	Per Cent Agreeing with Definition
42	26	5	11	61.9

The following is the definition of ornamental horticulture as it appears in the Dictionary of Occupational Titles.

> Conducts experiments and investigations on methods of improvement in quality and production of ornamental plants, such as flowering bulbs, herbaceous annuals and perennials, woody flower-bearing shrubs and trees, cacti, aquatic plants, vines, shrubs, and trees: Seeks such results as improved color or shape, increase in number of blooms, resistance to disease, and adaptability to conditions of shipping and storing. May specialize in flower culture and be designated as Floriculture; or in culture and artistic planting and trimming trees and be designated as Arboriculturist.

Each of the five respondents who disagreed with the definition made a comment about what needed to be changed. The following are the statements made by the nurserymen.

1. "In my opinion the word 'horticulture' means to be actively engaged in producing, as in agriculture, and not just conducting experiments and investigations."

2. "The definition should stress the study and operation rather than experiments and investigations."

3. "I would think that it should include proper usage of plants (landscaping)."

4. "It should add in the definition the taming of wild or bringing in new plants to the area that have potential."

5. "In my opinion the whole damn meaning is wrong. All that a nurseryman is is a glorified farmer."

In an attempt to broaden the term ornamental horticulture and move towards a cluster concept, the golf course superintendents in the state of Utah were contacted by questionnaire. Twenty-three of 65.3 per cent returned completed questionnaires.

The questionnaire survey indicated that 26.1 per cent of the golf courses in Utah were needing one or more golf course superintendents (See Table 23).

Table 23. Number and per cent of golf courses needing golf course superintendents

Number Reporting	Number Reporting Needing Golf Course Superintendents	Number Reporting Not Needing Golf Course Superintendents	Per Cent Needing Golf Course Superintendents
23	6	17	26.1

All respondents included in the sample indicated that there is a

scarcity of well qualified personnel for the position of golf course superintendent as indicated by Table 24. The table does not show this, but only six golf course professionals indicated that they would be needing a golf course superintendent by 1968.

Table 24. Number and per cent of golf course professionals indicating the scarcity of qualified golf course superintendents

Number Reporting	Number Reporting Scarcity	Number Reporting No Scarcity	Per Cent Reporting Scarcity
23	23	0	100

Various methods were used in the recruitment for the position of golf course superintendent. No one method was given preference over the others. Listed below are the procedures as stated by the golf course professionals.

1. Through the State Grounds Superintendents Organization
2. Local association of golf course superintendents
3. From other golf courses--generally an assistant
4. Use best man available from own present staff
5. Word of mouth--no experienced people in area
6. Ran ad in paper for a farmer, trained him with aid of U. S. Golf Association
7. Train and develop their own from raw recruits
8. Advertise in various papers

An indication as to what type of training a golf course superintendent must have was obtained by asking what the various golf course professionals

look for in a prospective employee. Table 25 indicates that there are a variety of traits applicable to the job of golf course superintendent. The trait indicated most often was that the superintendent should have knowledge of grasses, soils and course construction.

Table 25. Qualifications deemed necessary for the position of golf course superintendent

Qualification	Number Indicating the Qualification
Knowledge of grasses, soils and course construction	10
Desire or interest in work	5
Knowledge of new developments in equipment and plants	4
Able to understand and play golf	3
Mechanical background	3
Ability to organize and run a crew of men	3
Ability to get along with people	2
Ability to take care of his job on own initiative	2
Ability to convince board or city to give enough budget	2
Dependable	2
Congenial	2
Served at least three years as assistant	2
College degree in agronomy or turf management	1
Prepare and work with budgets	1
Ability to work with superiors	1
Able to work unscheduled hours	1
Ability to communicate	1
Must know irrigation and drainage	1
Married with family	1
Keep good records	1

The salary range for a golf course superintendent ranged from a low of $4,500 to a high of over $7,000. Two indicated that they worked half time for under $4,500. One respondent stated that the salary should be in the $6,500-$7,000 category because without a good superintendent, you do not have a course.

Table 26. Prevailing pay in the state of Utah for golf course superintendent

Salary	Number Receiving that Salary
Under $4,500*	2
$4,500-$5,000	3
$5,000-$5,500	3
$5,500-$6,000	9
$6,000-$6,500	0
$6,500-$7,000	0
Over $7,000	6

*For half time position.

Table 27, page 38, presents data reported by the golf professionals as knowledge items needed for success in the job. There was total agreement that the superintendent must know how to establish a turf by seeding, must understand maintenance and also how to re-establish a turf by sodding.

Table 27. Knowledge items deemed necessary for performance of principal tasks of golf course superintendent as rated by the golf course professionals

Knowledge Item	Must Know		Nice to Know		Not Necessary to Know	
	Number	Per Cent	Number	Per Cent	Number	Per Cent
Know how to establish a turf by seeding and its maintenance	23	100.0	0	0	0	0
Know how to establish turf, re-establish it by sodding and maintain it	23	100.0	0	0	0	0
Know theory of grass cutting and clipping	20	87.0	3	13.0	0	0
Know how to deal with problems of working with others	20	87.0	3	13.0	0	0
Know theory of supervision	20	87.0	3	13.0	0	0
Know fertilizer uses and their reaction with soils and plants	20	87.0	2	8.7	1	4.3
Know fertilizer composition	18	78.3	4	17.4	1	4.3
Know drainage and irrigation principles	18	78.3	4	17.4	1	4.3
Know disease identifications and its control	17	73.9	6	26.1	0	0
Know how to communicate orally	17	73.9	6	26.1	0	0

Table 27. Continued

Knowledge Item	Must Know		Nice to Know		Not Necessary to Know	
	Number	Per Cent	Number	Per Cent	Number	Per Cent
Know weed identification and their control	16	69.6	7	30.4	0	0
Know soil conditions that affect plant growth	16	69.6	6	26.1	1	4.3
Know grass identification and classification	16	69.6	5	21.7	2	8.7
Know plants by physical appearance	15	65.2	3	13.1	5	21.7
Know principles of operation, maintenance, tune-up of internal combustion engines	14	60.9	9	39.1	0	0
Know theory of cultivation	13	56.5	7	30.4	3	13.1
Know types and uses for various soil conditions	13	56.5	7	30.4	3	13.1
Know how to write reports and letters	12	52.2	8	34.8	3	13.1
Know plants by growth habits	12	52.2	7	30.4	4	17.4
Know basic properties of the soil and how to test for them	12	52.2	6	26.1	5	21.7

Table 27. Continued

Knowledge Item	Must Know		Nice to Know		Not Necessary to Know	
	Number	Per Cent	Number	Per Cent	Number	Per Cent
Know how to care for and maintain tools and motorized equipment	12	52.2	7	30.4	4	17.4
Know what type of plants to use for wind control	6	26.1	13	56.5	4	17.4
Know landscape principles and design	5	21.7	13	56.5	5	21.7
Know theory of plant adaptations	5	21.7	12	52.2	6	26.1
Know how to plant for wind control	7	30.4	12	52.2	4	17.4

LITERATURE CITED

Books and Research Papers

American Standard for Nursery Stock. Washington: American Association of Nurserymen, Inc., 1959.

Careers as a Landscape Architect and Landscape Nurseryman. Research Number 13. Chicago: The Institute for Research, 1961.

Center for Research and Leadership Development in Vocational and Technical Education. Exploring Occupational Opportunities in Ornamental Horticulture. Columbus: The Ohio State University, 1965.

Chronicle Occupational Brief Service and the Chronicle "3-in-1" Service. Nurseryman. Moravia, New York: Chronicle Guidance Publications, Inc., 1964.

First Technical Beautification Clinic. Washington: American Association of Nurserymen, 1967.

Louisiana State Department of Education. A Training Program for Vocational Agriculture in Ornamental Horticulture. Baton Rouge: Louisiana State University.

Olsen, Lee E. "A Study of Off-Farm Agriculture Occupations in North Davis, Morgan, and Weber Counties in Utah." Unpublished Master's Thesis, Utah State University, 1965.

"Ornamental Horticulture." A draft for review purposes. Produced by the State University Agricultural and Technical College, Farmington, New York, February, 1967.

Penney, John J. Beginning in the Nursery Business. Chicago: American Nurseryman, 1967.

Penney, John J. Operating a Garden Center. Chicago: American Nurseryman, 1967.

Penney, John J. Your Future in the Nursery Industry. New York: Richards Rosen Press, Inc., 1967.

Peterson, Paul. "A Study to Determine the Need for a Technician Type Program in Ornamental Horticulture at the Post High School Level in Davis, Salt Lake, and Utah Counties." Unpublished report. Utah State University, Logan, Summer, 1967.

Shank, Dean R. "A Study of the Off-Farm Agriculture Occupations of Utah, Salt Lake And South Davis Counties to Determine Educational Needs." Unpublished Master's Thesis, Utah State University, 1964.

Stephens, Allen Irving. "A Study to Determine the Vocational Needs of Agriculture Implement Dealers and Ornamental Horticulturists and Nursery Men in the Ogden Area." Unpublished Master's Thesis, Utah State University, 1966.

United States Department of Health, Education and Welfare. The Landscape Aide. Washington: Government Printing Office, 1964.

White, Robert Henry. "The Education of Ornamental Horticulture Technicians in Ohio." Unpublished doctoral dissertation, The Ohio State University, Columbus, 1967.

College Catalogs

Agricultural and Technical College at Alfred. 1966-1968 Bulletin. New York: State University of New York, 1967.

Agricultural and Technical College at Cobleskill. 1967-68 Bulletin. New York: State University of New York, 1967.

Agricultural and Technical College at Morrisville. 1967-68 Catalog. New York: State University of New York, 1967.

"Careers for Youth: Ornamental Horticulture." Cobleskill, New York: Agricultural and Technical College, State University of New York, 1967. (Mimeographed)

Cornell University, New York State College of Agriculture. 1967-68 Bulletin. New York: Cornell University, 1967.

Department of Floriculture and Ornamental Horticulture, New York State College of Agriculture. "Suggested Sequence of Courses for Department Majors." New York: Cornell University, 1967. (Mimeographed)

North Carolina State Record. 1966-1968 General Catalog. Raleigh: North Carolina State University, 1966.

University of Minnesota. 1967-69 Bulletin. Minneapolis: University of Minnesota, 1967.

"Your Future in Agronomy." Cobleskill, New York: Agricultural and Technical College, State University of New York, 1967. (Mimeographed).

APPENDIX

A study is being undertaken by the State Research Coordinating Unit, under the direction of the State Board for Vocational Education, to establish what skills and related information a worker should have so as to qualify as a nursery worker. This study will determine what skills and related information are absolutely necessary, those that would be directly beneficial, and those that Utah nurserymen feel are not necessary for the worker to know as an employee of your concern.

You have been selected to help in this study as we are trying to determine as accurately as possible the need for this type of a program.

Will you please fill out all pages of the questionnaire and return it as soon as possible in the stamped envelope provided. All information will be held strictly confidential, and data will not be available to others in any form except as part of the completed totals in the final report of the study.

Please take a few minutes to complete the form so that the final report can be presented at your Utah State Nurserymen's Association meeting in February.

Thank you for your time and effort.

Sincerely,

Austin G. Loveless, Associate Director
Utah Research Coordinating Unit

CONFIDENTIAL

Firm's Name_____ Year Established_____

City_____ State_____

Instructions: Complete all items pertaining to your firm. If exact information is unavailable, please estimate the answer. Return completed forms to: Utah State Coordinating Unit for Research.

I. Your firm's ownership (indicate type): Corporation_____ Partnership_____ Individual_____ Other (Specify)_____

II. Owner's or proprietor's professional profile:
   A. Name_____ Age_____
   B. Years engaged in this type of work_____
   C. How did you obtain the skills necessary for your success in this profession?

   / / On-the-job training
   / / From formal school training
   / / Self-taught
   / / Military schools
   / / Your agricultural background
   / / Correspondence schools
   / / Other (Specify)_____

III. Do you operate a greenhouse as part of your operation? Yes___ No___

IV. Employment profile:
   A. Peak employment (seasonal high, including temporary workers)
      Number of employees on salary_____ on hourly wage_____
   B. Low employment (basic year-round work force)
      Number of employees on salary_____ on hourly wage_____
   C. Do you employ women as part of your work force? Yes___ No___
      If yes, in what capacity?_____

   D. In your employment of personnel, what do you look for in a prospective employee? (List as many as you feel are pertinent in the success of the worker)
      a._____
      b._____
      c._____
      d._____
      e._____
      f._____

E. Is there a scarcity of well qualified workers in the nursery industry? Yes___ No___

F. What do your seasonal employees do in the off season?

a. _____

b. _____

c. _____

G. What per cent of your seasonal employees come back the following year? _____

H. If you employ workers that have no previous experience, how do you handle the training of this type of employee?

_____

_____

V. Automation profile:

A. In the last five years, how many power driven machines has your firm purchased? _____

B. Did the purchase of these machines reduce your work force? Yes___ No___ If yes, how many employees were eliminated? _____

VI. The following definition has been given for the term "ornamental horticulture."

Conducts experiments and investigations on methods of improvement in quality and production of ornamental plants, such as flowering bulbs, herbaceous annuals and perennials, woody flower-bearing shrubs and trees, cacti, aquatic plants, vines, shrubs, and trees: Seeks such results as improved color or shape, increase in number of blooms, resistance to disease, and adaptability to conditions of shipping and storing. May specialize in flower culture and be designated as Floriculture; or in culture and artistic planting and trimming trees and be designated as Arboriculturist.

Do you agree with the above description? Yes___ No___ If no, what would you change? _____

_____

VII. Various sources (men in the field, professional journals, professional associations and schools) list the following information and skills as necessary to enter and succeed in the ornamental horticulture as a skilled employee: There are three possible answers for each of the items listed below: must know, nice to know, not necessary to know. Please check only the one alternative that you feel is necessary in the success of the employee you hire.

Must Know	Nice to Know	Not Necessary to Know	
☐	☐	☐	Know plant classification and identification.

Must Know	Nice to Know	Not Necessary to Know	
☐	☐	☐	Know plant propagation from seeds, cuttings, layers, grafting, and division of roots.
☐	☐	☐	Know plants by growth habits.
☐	☐	☐	Know plants by physical appearance.
☐	☐	☐	Know basic properties of the soil and how to test for them.
☐	☐	☐	Know soil conditions that affect plant growth.
☐	☐	☐	Know fertilizer composition.
☐	☐	☐	Know fertilizer uses and their reaction with soils and plants.
☐	☐	☐	Know types of fertilizer to use and procedures in fertilizing trees.
☐	☐	☐	Know types and uses for various soil conditioners.
☐	☐	☐	Know drainage and irrigation principles.
☐	☐	☐	Know landscape principles and design.
☐	☐	☐	Know fundamentals of sketching or plotting and rendering a landscape design.
☐	☐	☐	Know theory of plant adaptations.
☐	☐	☐	Know how to landscape home areas.
☐	☐	☐	Know how to landscape commercial areas.
☐	☐	☐	Know how to landscape public roadways.
☐	☐	☐	Know theory of park design and operation.
☐	☐	☐	Know how to use walks, drives, fences, patios, pools in the use of landscape livability.
☐	☐	☐	Know how to plant for wind control.
☐	☐	☐	Know what type of plants to use for wind control.
☐	☐	☐	Know digging, balling, burlapping of nursery stock.
☐	☐	☐	Know how to establish a lawn by seeding and its maintenance.

Must Know	Nice to Know	Not Necessary to Know	
☐	☐	☐	Know how to establish turf, re-establish it and maintain it.
☐	☐	☐	Know how to harvest, store, and grade nursery stock.
☐	☐	☐	Know planting, caring, and grading of container grown stock.
☐	☐	☐	Know uses of and how to establish vegetables.
☐	☐	☐	Know uses of and how to establish potted plants.
☐	☐	☐	Know weed identification and their control.
☐	☐	☐	Know disease identification and its control.
☐	☐	☐	Know theory of cultivation.
☐	☐	☐	Know how heat and wind affect nursery stock.
☐	☐	☐	Know the effects of direct and indirect light on nursery stock.
☐	☐	☐	Know procedure for root and tap pruning for nursery stock development.
☐	☐	☐	Know theory and procedure for highway planting.
☐	☐	☐	Know theory and procedure for tree trimming and maintenance.
☐	☐	☐	Know procedure for greenhouse operations.
☐	☐	☐	Know principles of operation, maintenance, tune-up of internal combustion engines.
☐	☐	☐	Know how to care for and maintain tools and motorized equipment.
☐	☐	☐	Know how to write reports and letters.
☐	☐	☐	Know how to communicate orally.
☐	☐	☐	Know how to use materials for oral presentations.
☐	☐	☐	Know how to deal with problems of working with others.
☐	☐	☐	Know theory of supervision.
☐	☐	☐	Know uses of and how to establish bedding plants.

Must Know	Nice to Know	Not Necessary to Know	
☐	☐	☐	Know how to supervise and organize group work gangs.
☐	☐	☐	Know hiring practices of the nursery industry.
☐	☐	☐	Know laws on taxes, insurance, retirement, wages, and social security.
☐	☐	☐	Know methods of salesmanship.
☐	☐	☐	Know importance of service as it relates to customer satisfaction.
☐	☐	☐	Know procedures of record keeping and importance thereof.
☐	☐	☐	Know importance of keeping abreast with marketing trends.
☐	☐	☐	Know and keep abreast with legislation as it affects the nursery industry.
☐	☐	☐	Know bidding procedures.

VIII. If you had an opening, would you be willing to hire a student who is taking this type of a program? Yes___ No___

IX. Would you be willing to be part of a committee that would be advisory in nature in helping to set up a course in ornamental horticulture? Yes___ No___

X. If a curriculum is set up in ornamental horticulture, would you be willing to teach classes within the above areas? Yes___ No___ If yes, in what areas do you feel qualified to teach?_____

_____

_____

AN IN-DEPTH STUDY TO ASCERTAIN WHETHER THERE IS A NEED IN THE STATE OF UTAH FOR A POST HIGH SCHOOL PROGRAM IN ORNAMENTAL HORTICULTURE

Your completed questionnaire has not yet been received. Will you please take a few minutes right now and complete it and put it in the mail.

Your viewpoints are very important to this study. Without the information that only you can give, this study will not be complete and therefore of far less value.

Please complete the questionnaire and return it immediately. We appreciate your interest and promptness.

Sincerely,

Austin G. Loveless, Associate Director
Utah Research Coordinating Unit

AGL/db

Two weeks ago you received a questionnaire requesting information about your operations and needs in ornamental horticulture.

I know you are extremely busy while the weather is favorable; however, without your help, the study will not show the true picture of just what skills are needed by the worker in the state of Utah in regard to the ornamental horticulture industry.

I am enclosing another copy of the questionnaire in case the previous one has been misplaced and 10¢ for a "break" on us for helping in making this study a success.

Sincerely,

Austin G. Loveless, Associate Director
Utah Research Coordinating Unit

AGL/db
Enclosure

A study is being undertaken by the State Research Coordinating Unit, under the direction of the State Board for Vocational Education, to establish what skills and related information a worker should have so as to qualify as a golf course superintendent. This study will determine what skills and related information are absolutely necessary, those that would be directly beneficial, and those that Head Golf Professionals feel are not necessary for the worker to know as an employee of your concern.

You have been selected to help in this study as we are trying to determine as accurately as possible the need for this type of a program.

Will you please fill out all pages of the questionnaire and return it as soon as possible in the stamped envelope provided. All information will be held strictly confidential, and data will not be available to others in any form except as part of the completed totals in the final report of the study.

Thank you for your time and effort.

Sincerely,

Austin G. Loveless, Associate Director
Utah Research Coordinating Unit

AGL/db

Golf Course (Name)_____ City_____

Instructions: Complete all items as it pertains to your golf course. If exact information is unavailable, please estimate the answer.

I. Are you presently seeking to hire one or more experienced greens keepers? Yes___ No___ If yes, how many?_____

II. Is there a scarcity of well qualified workers available for the position of greens keeper? Yes___ No___

III. How do you go about recruiting men for the position of head greens keeper at your golf course?_____

_____

IV. In your employment of the head greens keeper, what do you look for in a prospective employee? (List as many as you feel are pertinent in the success of the employee).

a._____

b._____

c._____

d._____

e._____

f._____

V. What is the prevailing pay for the head greens keeper? Check one.

☐ $4000-$4500
☐ $4500-$5000
☐ $5000-$5500
☐ $5500-$6000
☐ $6000-$6500
☐ $6500-$7000
☐ over $7000

VI. Various sources (men in the field, professional journals, professional associations and schools) list the following information and skills as necessary to enter and succeed in the ornamental horticulture as a skilled employee: There are three possible answers for each of the items listed below: must know, nice to know, not necessary to know. Please check only the one alternative that you feel is necessary in the success of the employee you hire.

Must Know	Nice to Know	Not Necessary to Know	
☐	☐	☐	Know grass classification and identification.

Must Know	Nice to Know	Not Necessary to Know	
☐	☐	☐	Know plants by growth habits.
☐	☐	☐	Know plants by physical appearance.
☐	☐	☐	Know basic properties of the soil and how to test for them.
☐	☐	☐	Know soil conditions that affect plant growth.
☐	☐	☐	Know fertilizer composition.
☐	☐	☐	Know fertilizer uses and their reaction with soils and plants.
☐	☐	☐	Know types and uses for various soil conditioners.
☐	☐	☐	Know drainage and irrigation principles.
☐	☐	☐	Know landscape principles and design.
☐	☐	☐	Know theory of plant adaptations.
☐	☐	☐	Know how to plant for wind control.
☐	☐	☐	Know what type of plants to use for wind control.
☐	☐	☐	Know how to establish a turf by seeding and its maintenance.
☐	☐	☐	Know how to establish turf, re-establish it and maintain it.
☐	☐	☐	Know weed identification and their control.
☐	☐	☐	Know disease identification and its control.
☐	☐	☐	Know theory of cultivation.
☐	☐	☐	Know principles of operation, maintenance, tune-up of internal combustion engines.
☐	☐	☐	Know how to care for and maintain tools and motorized equipment.
☐	☐	☐	Know how to write reports and letters.
☐	☐	☐	Know how to communicate orally.
☐	☐	☐	Know how to deal with problems of working with others.
☐	☐	☐	Know theory of supervision.
☐	☐	☐	Know theory of grass cutting and clipping.

The following colleges, universities and technical schools sent information on their programs in ornamental horticulture.

New York Agricultural & Technical Institute
Department of Ornamental Horticulture
Alfred, New York 14802

Professor Darrell E. Walker
Pennsylvania State University
Department of Horticulture
University Park, Pennsylvania 16802

Professor Apple
Oregon State University
Department of Horticulture
Corvallis, Oregon

North Carolina State College
Department of Horticulture
Raleigh, North Carolina

New York Agricultural & Technical Institute
Department of Ornamental Horticulture
Morrisville, New York

New York Agricultural & Technical Institute
Department of Ornamental Horticulture
Farmingdale, L.I., New York

New York Agricultural & Technical Institute
Department of Ornamental Horticulture
Cobleskill, New York 12043

Professor James W. Boodley
Cornell University
Department of Ornamental Horticulture
Ithaca, New York 14850

Dr. Leon G. Snyder
University of Minnesota
Department of Horticulture
St. Paul, Minnesota 55101

Dr. H. John Carew
Michigan State University
Department of Horticulture
East Lansing, Michigan

Professor Ervin H. Zube
Stockbridge School of Agriculture
Department of Horticulture
Stockbridge, Massachusetts

Kansas State University
Department of Horticulture
Manhatten, Kansas

Dr. John P. Mahlstede
Iowa State University
Department of Horticulture
Ames, Iowa 50010

University of Georgia
Department of Horticulture
Athens, Georgia 30601

Dr. E. P. Brasher
University of Delaware
Department of Horticulture
Newark, Delaware 19711

California State Polytechnic College
Department of Horticulture
San Luis Obispo, California