

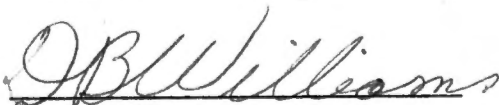
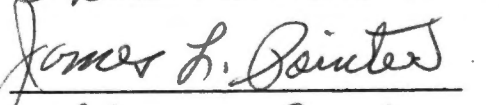
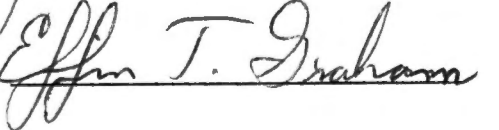
To the Graduate Council:

I am submitting herewith a thesis written by Edgar Lee Abbott entitled "The Requirements of Business and Industry for Qualified Ornamental Horticulturists." I recommend that it be accepted in partial fulfillment of the requirements for the degree of Master of Science, with a major in Ornamental Horticulture and Landscape Design.



Gary L. McDaniel, Major Professor

We have read this thesis and
recommend its acceptance:

Accepted for the Council:



Vice Chancellor
Graduate Studies and Research

Thesis

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THE REQUIREMENTS OF BUSINESS AND INDUSTRY
FOR QUALIFIED ORNAMENTAL HORTICULTURISTS

A Thesis

Presented for the

Master of Science

Degree

The University of Tennessee, Knoxville

Edgar Lee Abbott

December 1978

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ABSTRACT

This research is dedicated to an examination of the Baccalaureate level graduate in horticulture for skills and competencies possessed upon graduation. The investigation includes an evaluation by a segment of the horticulture industry for appropriateness of the education obtained and its value to the industry. The results of a survey completed by industry representatives indicate strong satisfaction with the skills developed by academic course content and with the courses most often represented in curriculas of land grant universities in the southeastern United States. Survey results indicate that positions existing or available for the B.S. graduate in this segment of the industry are not particularly attractive from the standpoint of beginning salary and annual salary increases. A conclusion is also reached that participation in work-study programs may be a viable solution to the industry's indication of the high value industry places on practical experience in the survey. The final conclusion reached from industry response to the survey is that more research is needed in different segments and areas of career potential and in other geographic regions of the nation.

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CHAPTER I

INTRODUCTION

Land grant universities have been educating increasing numbers of horticulturists since 1971 (17). While no single factor stands out as having caused this increase of majors there seems to be increased national environmental awareness and change, including urban renewal movements; population shifts from urban to suburban living conditions, construction of greenbelts, parks, golf courses, conservation areas, recreational areas; and interior as well as exterior use of plant materials. All of these demand the management abilities of people skilled in the selection and cultivation of plants and the maintenance of the site affected (1, 2, 3, 14). In addition to producing the numbers of horticulturists involved in this "green revolution;" the increased need for researchers, teachers and extension personnel is an integral part of the overall effort (3, 6, 8).

The preparation of students to assume roles in the field has caused considerable reorganizing of the academic community's administrative and teaching functions so as to produce the most competent graduates (3, 4, 5, 6, 7, 10, 14, 16).

This research was directed to an examination of the skills and competencies developed in a horticulturist who has qualified for a baccalaureate degree. Effort has been expanded to develop a composite graduate since no two schools have precisely the same graduation

requirements. A survey sample was made of the horticultural industry in the southeastern United States to obtain opinions of potential employers or "users" of horticultural graduates concerning the value of the course work and usefulness of the skills developed. In addition to evaluating qualifications, survey respondents were requested to indicate where they would place a graduate in their business, and the approximate starting salary and annual increases that could be expected. Information was also sought on the nature of the respondents business and his attitude and interest in participating in student work-study programs.

CHAPTER II

LITERATURE REVIEW

Recognition of trends for growth of the horticultural industry at the beginning of what has been a period of significant growth may have attracted young people to careers in horticulture at an increasing rate during the 1970's (1, 2, 16). Factors such as the need for protection of the environment, urban renewal, population shifts from urban to suburban and rural areas, hobby interests in plant materials, and desirable working conditions have all had some influence on career decisions in horticulture (14, 16). Enrollment figures reflect that students have entered the University of Tennessee, Knoxville, Department of Ornamental Horticulture and Landscape Design at an increasing rate, i.e., 25 majors in September 1971 to 210 in September of 1978, an 840 percent increase (17). It is reasonable to consider that this experience is shared by other southeastern land grant institutions addressed in this study, who have been responsible for preparing students for careers in floriculture, horticultural therapy, ornamental and landscape horticulture, floral design and interior planting, landscape design and contracting, and the production and processing of fruits and vegetables.

This preparation is not without challenge and problems. However, the leaders of the scientific and academic community have been aware of and have addressed the problems during the past eight years (4, 6, 7, 11).

The industry has found that graduates in horticulture, despite the practical inexperience that many industry leaders cited, could make a

meaningful difference in profits by making fewer mistakes than those less educated (16). Thus, programs of internship evolved between academia and industry (10, 13, 14, 16, 18) that granted academic credit to the students who participated. This approach should shorten the period of time needed for on-the-job training in the peculiarities of a specific company. Although the numbers of operational internship programs are small, there is optimism for the future based on the selectivity that this experience grants the potential employer (6, 10, 11, 12, 13, 14, 16).

These programs have also helped disprove the idea that women could not successfully compete in the field (11, 16). Studies of the many career opportunities that exist in horticulture report that opportunities for the college graduate need not be limited by sex or physical handicap (8). Professional working groups of the American Society for Horticultural Science should also consider these matters (3).

Besides the internship programs, which usually will involve an off campus quarter or semester, academia has also provided for a balance of practical experience in courses by requiring "hands-on" work under both laboratory and field conditions. Practical special problem courses have been developed for which credit is awarded under faculty supervision (10). Participation in public service projects has been another benefit of laboratory course work (1). Experience can be gained and demonstrated to prospective employers (19, 15, 16). Members of the industry and nonprofit organizations have provided experiences as a service to the horticultural community by awarding scholarships for summer internships for students (16). In one case, florist business

owners conducted symposiums at a university to provide students with industry information (7, 13).

Of concern to land grant universities facing increasing enrollments was the problem of organizing teaching to meet the needs of growth in the most efficient manner. Gabelman found diversity of approach, and varied solutions for organizing departments of horticulture, with its close relationship to other departments in Colleges of Agriculture, with the resulting pattern that now exists where the department of horticulture is a part of a larger framework of agricultural education (5). He concludes with the caution that periodic review of the organization is essential to assure that it functions to produce the desired product.

Curricula development to meet the need of horticulturists has been complex, considering the variety of possible occupational directions within the general field (1, 2, 6, 8). This is further complicated by the changing nature of these occupations during the period of growth. Needs have varied from a curriculum predominantly oriented to production of plant materials to refined specialization within the field while retaining the broad background necessary to develop the general horticulturist. These changing needs require constant review and adjustment of curricula that will prepare the graduate for practical application. There has also been a requirement for additional consideration of such subjects as business, economics, education, sociology, etc. (6,8). Curricula planners should not ignore the demands of students for preparation that will enable them to have their own

business at some point in the future. This preparation dominates some students' career planning. Others recognize that the very costs of going into business for one's self will prevent their doing so now, or in the foreseeable future, and consideration in curricula planning must then include preparation of students to assume roles in larger industry functions or service industries. There is also the obvious need to produce and prepare researchers, extension personnel, and teachers. These influences have led to planning and presentation of balanced curricula in which some courses are taught with regularity and others on periodic need (6, 8, 10). Advisors must be given authority and flexibility to design individual programs for their students (8, 14). We find then a need for "core" as well as "non-core" courses to satisfy the needs of large numbers of students. Of basic concern is the need for broad based education, complemented by specialization (5, 6, 8, 13, 17).

Solutions to complex problems should be tested for adequacy until we arrive at conclusions that will indicate satisfaction with the results obtained. For our purposes two major interest groups are concerned, first the horticultural educators and secondly the horticultural employers, be it in industry, research activities, extension, or teaching. The day-to-day association of land grant institutions with research, teaching, and extension service activities enables constant evaluation and adjustment. On the other hand, studies must be conducted among representatives of the horticultural industry to validate that the "product" has been properly prepared or that closer liason between academia and industry is essential to develop the skills and competencies that have been acquired

by students of horticulture while in college (9).

One such study conducted among nurserymen in Florida resulted in the conclusion that educational background, character, and experience on the job were the most highly desired qualities in new employees. The university graduate was deemed to be a good investment because of scientific background and ability to cope with problems (9). This study encourages additional investigation in order to arrive at broader conclusions that can be used to determine the success of these efforts to improve the state of horticulture science.

CHAPTER III

MATERIALS AND METHOD

The processes and techniques used in executing this study are reported here as follows:

I. MAJOR TASKS OF THE STUDY

The major tasks that were undertaken to solve the problem were directed at:

1. Selecting a regional sample of Land Grant Universities teaching courses in horticulture and a regional group of states with common industry interest in employing baccalaureate graduates from institutions teaching horticulture.
2. Analyzing the course offerings being taught at the sampled institutions and constructing lists of skills and competencies developed for evaluation by industry representatives making up the survey population.
3. Designing of a survey instrument that would provide the data sought and dissemination of the survey to industry samples.
4. Collection of the data resulting from the survey and preparation of it for analysis.

II. THE SAMPLE

The study originated with the selection of land grant universities in the Southeastern United States and the horticultural industry survey

sample was drawn from the states in which the universities were located. The ten states to be represented in the study were as follows: Florida, Georgia, Alabama, South Carolina, North Carolina, Tennessee, Virginia, Kentucky, Louisiana and Mississippi. The sample selection was from membership of the Society of American Florists and Ornamental Horticulturists and from the Southern Nurserymen's Association. In order to assure significance, 500 members of each of these professional associations were surveyed. Selection of respondents was based on a completely randomized sampling, within these membership lists.

III. SURVEY DATA

Necessary information concerning the course offerings and the skills and competencies developed as a result of course completion was collected by corresponding with the participating institutions (Appendix A) and review of the catalog course descriptions. From this analysis a Master Matrix (Appendix B) was developed. Further investigation indicated that some courses were taught by only a small number or single schools and still others were not offered to majors in horticulture. A refined or "Core" Matrix (Appendix C) was developed based on requirements for graduation and frequency of course scheduling that seemed to satisfy the identification of a common or basic education in horticulture leading to a baccalaureate degree in the field. The basic information provided by the participating institutions was also used to develop the list of skills and competencies for eventual evaluation by the industry sample.

IV. THE SURVEY

A survey was developed in three main sections. First, it was decided that certain information about the sample being surveyed would be needed and the preliminary section was designed with this in mind. The main portion pertaining to the educational experience was then constructed and provided for the collection of the data on individual courses as well as for summary data and the final section related to employability and to attitudes on work-study programs (Appendix D). Every effort was directed to ease of completion with the hope that this would encourage participation. Provision was also included for computer program design and mechanical scoring of data.

The survey was dispatched with covering correspondence on August 9, 1978, and by early October, 151 completed responses were received (15.1%). Additionally, 42 surveys were returned as undeliverable by Postal Authorities or in some cases where respondents felt that their participation would be inappropriate.

The responses were coded upon receipt and analysis of the completed surveys was initiated during October, 1978.

CHAPTER IV

RESULTS AND DISCUSSIONS

Results were obtained by the use of the standard Statistical Analysis System (SAS) computer technique which produced frequency distributions and percentages. Cumulative distributions and percentages were also provided to validate use of all responses.

I. RESPONDENT PROFILE

Section I of the survey concerned personal characteristics of the respondents and their businesses. In 79.5 percent of the sample response cases the survey was completed by the Owner-Manager, while 20.5 percent of the responses were completed by a manager only. Of those responding, 47 percent indicated that they had been in the business from 1-10 years and 53 percent claimed experience of from 10-40 years. The group claiming the longest seniority, or 30-40 years in the industry, comprised 10.6 percent of the total response group. Of the group, 47 percent indicated that they had received their training by experience on the job and 63 percent by a combination of education and experience. Of this latter group, 42 percent of respondents reported that their educational preparation had been very important and 41 percent felt that their education had prepared them to some degree. Educational levels of the respondents were reported to be at the high school or vocational school level (20 percent), two year college graduates (18 percent), four

year college graduates (50 percent) and 12 percent of the respondents were at the Master of Science level.

Categories of businesses operated by the respondents showed the following: nurseries (wholesale and retail) = 50 percent, greenhouses (wholesale and retail) = 25 percent, garden centers = 15 percent, and suppliers = 10 percent. Nurseries reporting were divided into two groups: 1-20 acres in size = 70 percent; and 21 to over 100 acres in size = 30 percent. Similarly, greenhouse operations ranged from a group in the size of up to 15,000 sq. ft. = 32 percent, a group in the 15,000 - 100,000 sq. ft. range = 57 percent, and a group of greenhouse operators whose operations were from 100,000 sq. ft. to over 200,000 sq. ft. = 11 percent. Garden centers were divided into two groups, those with 1,000 sq. ft. or less of interior space, 53 percent; and those with over 1,000 sq. ft. of interior space, 47 percent. This group similarly reported that they had up to 10,000 sq. ft. of exterior space, 56 percent; or over 10,000 sq. ft. of exterior display space, 44 percent.

Suppliers to the industry were in two categories. One group (51 percent) reported that they had up to 10,000 sq. ft. interior space, and another, (47 percent) had over 10,000 sq. ft. of interior space. Similarly, this group reported businesses that had less than 20,000 sq. ft. of exterior space (44 percent) and 56 percent were larger than that size. Approximate annual gross income of the responding group indicated that 70 percent had a gross income of \$100,000 or more and 30 percent of the responding businesses had earnings of from \$10,000 to \$100,000 annually. The work forces of the businesses responding to this survey ranged widely from small operations with two or three full time employees

to the largest firm who reported 107 full time employees. Crop identification of the responding group indicates that 76 businesses were involved in the production of woody ornamentals, 57 in potted foliage material, 42 in bedding plants, 51 in either potted or cut flower crops, 10 in growing turf, and 26 involved in specialty crops production.

II. EVALUATION OF COURSEWORK

This section concerns evaluation of skills or knowledge a graduate at the Bachelor's level has gained from courses taught in the Horticulture or Ornamental Horticulture department of the land grant institution. Respondent evaluations are displayed in Tables I through VIII.

When reviewing these evaluations one must assume that at least a small degree of bias is unavoidable due primarily to the wide spectrum of businesses involved in the responses. Course work in a specific area can be vital to the individual responding or conversely can lack importance to the respondent's specific business. This can be further evidenced by considering that in each case a portion of the total sample (151) responded to specific areas or even to specific questions within an area. Although most respondents addressed this section of the survey, some did bypass questions or entire courses and based their nonresponse on the fact that they did not feel qualified to advance an opinion.

This section of the survey concluded with a request that respondents evaluate four characteristics of a B.S. graduate in Ornamental Horticulture in order of desirability. Respondents rated Practical Experience,

TABLE I
COURSE SKILLS EVALUATION FOR LANDSCAPE GARDENING AND
PLANT MATERIALS—ORNAMENTAL SHRUBS AND VINES

	Essential ²	Important Not Essential	Useful	Useful but not Necessary	NR*
<u>Landscape Gardening</u>					
Completion of the course will enable the student to:					
1. Identify and know the cultural requirements of major plant materials used in the landscape.	78 51.7	21 13.9	8 5.3	5 3.3	39 25.8
2. Know the design values of the plant materials used in the landscape.	58 38.4	33 21.9	16 10.6	6 4.0	38 25.2
3. Be capable of installing plant materials considering environmental needs and protection.	67 44.3	23 15.2	15 10.0	7 4.6	39 25.8
4. Prepare basic designs for residential properties using valid design principles.	52 34.4	38 25.1	13 8.6	8 5.3	40 26.5
5. Understand management practices for post-installation growth and development of the landscape.	46 30.5	41 27.2	16 10.6	9 5.9	39 25.8
6. Be familiar with construction materials and their uses for patios, decks, planters, etc.	26 17.2	42 27.8	32 21.2	12 7.9	39 25.8
<u>Plant Materials—Ornamental Shrubs and Vines</u>					
Completion of the course will enable the student to:					
1. Identify the major shrubs and vines used in landscaping.	82 54.3	20 13.2	10 6.6	3 2.0	36 23.8
2. Understand the origin and classification of shrubs and vines used in landscaping.	15 9.9	39 25.8	42 27.8	18 11.9	37 24.5
3. Understand the adaptation and use of shrubs and vines used in landscaping.	52 34.4	33 21.9	22 14.6	7 4.6	37 24.5
4. Appreciate the design values of shrubs and vines used in the landscape.	32 21.2	43 24.5	28 18.5	11 7.3	37 24.5
5. Understand the environmental needs of shrubs and vines used in landscaping and protection against pests.	57 37.7	29 19.2	20 13.2	8 5.3	37 24.5

*Number (upper) and percent (lower) not responding.

²Upper number in each box indicates number of respondents to the question, the lower number indicates percent.

TABLE II
COURSE SKILLS EVALUATION FOR PLANT PROPAGATION
AND HOME GROUNDS MANAGEMENT

	Essential ²	Important Not Essential	Useful	Useful but not Necessary	NR*
<u>Plant Propagation</u>					
Completion of the course will enable the student to:					
1. Understand the science and practice of propagating plant materials.	77 51.0	25 16.6	17 11.3	8 5.3	24 15.9
2. Be capable of propagating by the use of grafting, budding, cuttage, division, layerage, and germinating seeds for primarily commercial production.	72 47.7	30 19.9	18 11.9	6 4.0	25 16.6
3. Manage the environmental needs and development of propagated material to the stage of final placement in residential or public areas.	57 37.7	31 20.5	24 15.9	15 9.9	24 15.9
4. Manage the protection of propagated material against pests.	79 52.3	21 13.9	16 10.6	12 7.9	23 15.2
<u>Home Grounds Management</u>					
Completion of the course will enable the student to:					
1. Successfully transplant trees, shrubs, bedding plants, ground covers, etc.	65 43.0	28 18.5	14 9.3	5 3.3	39 25.8
2. Perform minimal propagation of the above plant materials.	29 19.2	39 25.8	27 17.9	17 11.3	39 25.8
3. Manage the home landscape including pruning, fertilizing, control of pests, watering, etc.	57 37.7	37 24.5	13 8.6	4 2.6	40 26.5
4. Manage lawn areas.	44 27.2	33 21.9	28 18.5	5 3.3	44 29.1
5. Use tools and associated equipment.	36 23.8	25 16.6	32 21.2	19 12.6	39 25.8
6. Plan effective color displays throughout the growing season.	28 18.5	40 26.5	33 21.9	9 6.0	41 27.2
7. Identify major native and nonnative plants.	39 25.8	35 23.2	27 17.9	10 6.6	40 26.5

TABLE III
COURSE SKILLS EVALUATION FOR PLANTS MATERIALS—HOUSE PLANTS AND
PLANT MATERIALS—ORNAMENTAL TREES

	Essential ²	Important Not Essential	Useful	Useful but not Necessary	NR*
<u>Plant Materials—House Plants</u>					
Completion of the course will enable the student to:					
1. Identify and classify the major groups and varieties of plants used in the home and public interior spaces.	65 43.0	35 23.2	16 10.6	4 2.6	31 20.5
2. Be capable of propagating and satisfying the cultural needs of house plants.	45 29.8	43 28.5	23 15.2	8 5.3	32 21.2
3. Be capable of combining the cultural needs of house plants with interior design placement of major categories of house plants considering size, texture, and arrangement in containers, planters, etc.	27 17.9	45 29.8	40 26.5	7 4.6	32 21.2
4. Be capable of controlling pests of house plants.	56 37.1	39 25.8	22 14.6	3 2.0	31 20.5
5. Know the history, origins and classification of these plants and their cultivation requirements.	18 12.0	30 19.9	45 29.8	26 17.2	32 21.2
<u>Plant Materials—Ornamental Trees</u>					
Completion of the course will enable the student to:					
1. Identify the major native ornamental trees used in the landscape.	79 52.3	24 15.9	4 2.6	7 4.6	37 24.5
2. Identify the major nonnative ornamental trees used successfully adapted and used in the landscape.	52 34.4	43 28.5	11 7.3	7 4.6	38 25.2
3. Know the history, origins and classification of these trees and their cultivation requirements.	13 8.6	36 23.8	45 29.8	19 12.6	38 25.2
4. Appreciate and be capable of using the design characteristics and values of the trees used in landscaping.	37 24.5	47 31.1	23 15.2	5 3.3	39 25.8
5. Understand the environmental needs of ornamental trees used in the landscape and the protection of these trees against pests.	53 35.1	31 20.5	21 13.9	8 5.3	38 25.2

TABLE IV
COURSE SKILLS EVALUATION FOR LANDSCAPE DESIGN
AND FLORAL DESIGN

	Essential ²	Important Not Essential	Useful	Useful but not Necessary	NR*
<u>Landscape Design</u>					
Completion of the course will enable the student to:					
1. Be capable of perceiving design in three dimensions.	52 34.4	39 25.8	9 6.0	13 8.6	38 25.2
2. Understand and apply elements of design.	63 41.7	33 21.9	7 4.6	10 6.6	38 25.2
3. Understand plant and structural material and their uses in design.	65 43.0	31 20.5	8 5.3	9 6.0	38 25.2
4. Be capable of estimating costs.	61 40.4	29 19.2	18 12.0	4 2.6	39 25.8
5. Be capable or calculating landscape parameters.	38 25.2	43 28.5	22 14.6	8 5.3	40 26.5
6. Prepare landscaping specifications.	50 33.1	40 26.5	14 9.3	7 4.6	40 26.5
7. Design, present and develop properties.	56 37.1	33 21.9	14 9.3	9 6.0	39 25.8
<u>Floral Design</u>					
Completion of the course will enable the student to:					
1. Successfully design basic arrangements including such items as table arrangements, corsages, etc. for commercial use.	55 36.4	27 17.9	15 9.9	12 7.9	42 27.8
2. Understand and practice the construction of arrangements consistent with accepted design principles.	44 29.1	34 22.5	21 13.9	9 6.0	43 28.5
3. Understand the physiology of plant material.	29 19.2	37 24.5	34 22.5	8 5.3	43 28.5
4. Understand and practice arranging floral materials for special holiday and occasion.	35 23.2	34 22.5	26 17.2	13 8.6	43 28.5
5. Understand the principles involved in preparing arrangements for judging and competitions.	5 3.3	34 22.5	32 21.2	37 24.5	43 28.5

TABLE V
COURSE SKILLS EVALUATION FOR WHOLESALE NURSERY MANAGEMENT
AND RETAIL NURSERY MANAGEMENT

	Essential ²	Important Not Essential	Useful	Useful but not Necessary	NR*
<u>Wholesale Nursery Management</u>					
Completion of the course will enable the student to:					
1. Understand nursery soils.	91 60.3	14 9.3	13 8.6	2 1.3	31 20.5
2. Understand plant propagation.	92 60.9	16 10.6	10 6.6	1 0.7	32 21.2
3. Understand field production practices.	84 55.6	20 13.2	10 6.6	3 2.0	34 22.5
4. Understand harvesting operations.	77 51.0	24 15.9	13 8.6	4 2.6	33 21.9
5. Understand shipping, storage, protection.	79 52.3	24 15.9	11 7.3	4 2.6	33 21.9
6. Understand tools and equipment.	69 45.7	23 15.2	22 14.6	4 2.6	33 21.9
7. Understand labor management.	79 52.3	26 17.2	8 5.3	5 3.3	33 21.9
8. Understand laws and regulations pertaining to nurseries.	70 46.4	29 19.2	16 10.6	5 3.3	31 20.5
<u>Retail Nursery Management</u>					
Completion of the course will enable the student to:					
1. Be able to select locations for retail outlets.	44 29.1	30 19.9	24 15.9	10 6.6	43 28.5
2. Be able to design layout of garden center.	48 31.8	31 20.5	22 14.6	6 4.0	44 29.1
3. Understand production of woody plants.	46 30.5	35 23.2	25 16.6	3 2.0	42 27.8
4. Understand buying, sources, shipping, etc.	74 49.0	24 15.9	7 4.6	2 1.3	44 29.1
5. Understand rules and regulations affecting a business.	62 41.0	32 21.2	12 7.9	3 2.0	42 27.8
6. Understand advertising and promotions.	54 35.8	36 23.8	16 10.6	2 1.3	43 28.5
7. Understand basic landscape design.	41 27.2	42 27.8	20 13.2	5 3.3	43 28.5
8. Understand people-plant relationships.	51 33.8	35 23.2	19 12.1	4 2.6	42 27.8

TABLE VI
COURSE SKILLS EVALUATION FOR GENERAL HORTICULTURE AND
GREENHOUSE MANAGEMENT

	Essential ²	Important Not Essential	Useful	Useful but not Necessary	NR*
<u>General Horticulture</u>					
Completion of the course will enable the student to:					
1. Possess a working knowledge of fundamental plant processes.	80 53.0	31 20.5	13 8.6	0 0	27 17.9
2. Know the influence of light, temperature, nutrients upon vegetative growth and reproduction of horticultural plants.	84 55.6	26 17.2	13 8.6	1 0.7	27 17.9
3. Understand production practices, harvesting, storage, of the principal ornamental, and in some cases, fruit and vegetable, crops.	65 43.0	35 23.2	20 13.2	4 2.6	27 17.9
4. Understand the role of horticulture in improvement of the environmental quality, economics and aesthetics of the landscape and in nutrition and medicinal uses.	39 25.8	47 31.1	21 13.9	15 9.9	29 19.2
<u>Greenhouse Management</u>					
Completion of the course will enable the student to:					
1. Grow greenhouse crops.	91 60.3	15 9.9	10 6.6	3 2.0	32 21.2
2. Design and construct hobby and commercial greenhouses.	19 12.6	47 31.1	29 19.2	24 15.9	32 21.2
3. Understand and manage the effects of light intensity, light duration, temperature, water and nutrients on greenhouse crops.	93 61.6	18 12.0	4 2.6	3 2.0	33 21.9
4. Understand and manage the heating, cooling, ventilation, circulation, watering and fertilizing systems used in the greenhouse.	94 62.3	18 12.0	4 2.6	3 2.0	32 21.2
5. Understand and manage the various soil or soilless media used for growing greenhouse crops.	86 57.6	27 17.9	4 2.6	2 1.3	32 21.2
6. Understand and manage spray programs and application systems used to control insects and diseases in the greenhouses.	94 62.3	19 12.6	3 2.0	3 2.0	32 21.2

TABLE VII
COURSE SKILLS EVALUATION FOR FLORICULTURE COURSES AND
POST HARVEST PHYSIOLOGY

	Essential ²	Important Not Essential	Useful	Useful but not Necessary	NR*
<u>Floriculture Courses</u>					
(Cut and Pot Flowering Materials)					
Completion of these courses will enable the student to:					
1. Understand and practice the production of major commercial cut and pot flower crops.	73 48.3	22 14.6	12 7.9	3 2.0	41 27.2
2. Plan the rotation of crops to maximize production schedules.	74 49.0	22 14.6	9 6.0	5 3.3	41 27.2
3. Prepare and manage soil and soilless mixtures including soil testing.	73 48.3	23 15.2	11 7.3	3 2.0	41 27.2
4. Manage fertilization, watering, growth regulation, insect and pest controls, optimize light and temperature needs, etc.	85 56.3	14 9.3	8 5.3	3 2.0	41 27.2
5. Harvest and prepare crops for shipment and marketing.	62 41.1	28 18.5	16 10.6	4 2.6	41 27.2
6. Analyze production costs and consider alternative options or methods to obtain optimum cost relationships.	59 39.1	37 24.5	12 7.9	3 2.0	40 26.5
7. Become aware of sources of information for continuous adoption of improved practices.	46 30.5	43 28.5	20 13.2	2 1.3	40 26.5
<u>Post Harvest Physiology</u>					
Completion of the course will enable the student to:					
1. Understand the chemical and physiological changes that occur during harvesting, handling, packing, transportation, and storage of horticultural crops.	53 35.1	31 20.5	25 16.6	2 1.3	40 26.5
2. Recognize the preharvest and postharvest conditions which influence these changes and prescribe methods of coping with the undesirable effects on crop material.	51 33.8	30 19.9	27 17.9	2 1.3	41 27.2

TABLE VIII
COURSE SKILLS EVALUATION FOR PRINCIPLES OF FRUIT
PRODUCTION AND PRINCIPLES OF
VEGETABLE PRODUCTION

	Essential ²	Important Not Essential	Useful	Useful but Not Necessary	NR*
<u>Principles of Fruit Production</u>					
Completion of the course will enable the student to:					
1. Understand fruit bud formation, rest period, and water relations.	46 30.5	31 20.5	14 9.3	4 2.6	56 37.1
2. Control soil conditions and fertilization to optimize response of major varieties.	46 30.5	33 21.9	13 8.6	5 3.3	54 35.8
3. Understand planting, production, harvesting, storage, packing and marketing of fruit crops.	50 33.1	23 15.2	14 9.3	8 5.3	56 37.1
4. Provide protection against freezing of tissues and means of avoiding injury and disease and insect damage.	45 29.8	31 20.5	15 9.9	5 3.3	55 36.4
5. Know pruning principles and practices used to maximize production.	52 34.4	23 15.2	15 9.9	6 4.0	55 36.4
<u>Principles of Vegetable Production</u>					
Completion of the course will enable the student to:					
1. Know the growth habits of vegetable crops.	52 34.4	27 17.9	14 9.3	2 1.3	56 37.1
2. Know the climatic requirements of vegetable crops.	50 33.1	30 19.9	13 8.6	2 1.3	56 37.1
3. Be capable of preparing soil for vegetable crops.	49 32.5	29 19.2	15 9.9	2 1.3	56 37.1
4. Be capable of fertilizing, controlling pests and diseases in vegetable crops.	52 34.4	28 18.5	13 8.6	3 2.0	55 36.4
5. Have knowledge of harvesting stages, procedures, storage, marketing vegetable crops.	44 29.1	29 19.2	20 13.2	2 1.3	56 37.1
6. Be able to plan cropping and to cost account for the growing seasons.	48 31.8	25 16.6	17 11.3	5 3.3	56 37.1

Enthusiasm, Grades, and Horticultural Theory in descending order of importance.

Respondents were also requested to consider all courses they had evaluated previously and to categorize them as most important with a rating of 4, least important with a rating of 1.

Courses rated 4 or most important to the respondents were:

- Landscape Gardening
- Plant Propagation
- Greenhouse Management
- Plant Materials - Shrubs
- Plant Materials - Trees
- Nursery Management - Retail
- Nursery Management - Wholesale
- General Horticulture

Courses rated 3 by the respondents were:

- Home Grounds Management
- Plant Materials - Herbaceous
- Landscape Design
- Floriculture - Pot Crops

Course rated 2 by the respondents was:

- Floriculture - Cut Crops

Course rated 1 or least important by the respondents were:

- Floral Design
- Principles of Vegetable Production

Principles of Fruit Production

Advanced Fruit Production

Post Harvest Physiology

The same caution regarding bias based on individual or group interest should be considered when interpreting these results.

IV. RESPONDENT ATTITUDES ON EMPLOYMENT AND WORK STUDY PROGRAMS

Respondents were requested to answer the question, "What type of position does your firm have or could you offer a graduate?". The responses were: Sales positions 29, Production Management positions 16, Assistant Manager positions 25, Specialized Management positions (e.g. Crop Manager, Propagator), 37 and Trainee positions 68. Some respondents indicated that more than one position was available or could be offered. To a question concerning starting salary ranges for graduates, 48 respondents were willing to offer \$6,000-8,000 annually, 44 would offer \$8-10,000 annually, 22 indicated \$10-12,000 annually, and 4 each in the ranges of \$12-14,000 and over \$16,000 annually depending upon the position filled. The expectations for annual raises were reported as nine at zero to 2 percent, 36 at 2 to 5 percent, 56 in the 5 to 10 percent annual increase range and 8 indicated they would offer over 10 percent annual salary increase. A group of 37 respondents indicated that they were currently participating in a work-study program, 23 of them with a college or university at the undergraduate two year or four year college level.

CHAPTER V

SUMMARY AND CONCLUSIONS

I. SUMMARY

The results have exceeded expectations in several respects. There was an inherent risk in requesting heads of businesses to undertake the task (estimated at 30 to 45 minutes) of completing the survey, much of which was generally applicable to their business but also concerned matters that were not specifically relevant. They responded extremely well (85-90 percent) to questions about their business, their income, their education and their experience.

When considering the respondents' evaluation of skills and competencies developed during academic course work one must consider that the responding group was composed of Nurserymen (50 percent), Greenhouse Operators (25 percent), Garden Center operators (15 percent) and Suppliers (10 percent). This becomes important particularly when considering some responses, which appear to be biased.

The evaluation of skill development within academic courses was the most time-consuming part of the survey, but was also the area in which the respondents were most diligent. A group of 70 to 80 percent responded to this part of the questionnaire. The smaller response, 63-65 percent, in the area of Fruit and Vegetable Production could represent a bias on the part of a response group whose interests are in ornamental plant materials.

In rating the skills and competencies developed as a result of course work completed, the respondents awarded high ratings on an overall basis but they clearly indicated any skill which they did not consider to be as important as others. Less than 10 percent considered the following subjects essential: item 2, Table I, p. 15, Plant Materials - Ornamental Shrubs and Vines; item 3, Table III, p. 17, Plant Materials - Ornamental Trees; item 5, Table IV, p. 18, Floral Design. A possible bias exists here because businessmen may not place a high value on theory and aesthetics.

When the response group evaluated practical experience, enthusiasm, grades and theory from most to least important, they followed what was anticipated as the response pattern in a profit-oriented situation. It is possible that sufficient credence had not been given to the level of understanding of subject matter reflected in grades and the scope of theoretical background leading to the conclusion reached by University of Florida researchers in 1976 when they reported that the survey conducted among Florida nurserymen concluded that the University graduate was deemed to be a good investment because of scientific background and ability to cope with problems (9).

Course evaluation provided by the respondents where they were requested to rate each course as most important with a rating of 4 to least important with a rating of 1 did not provide any significant information. Respondents rated most courses as 4 or 3. The courses they did not rate highly were Fruit and Vegetable crop courses, Post Harvest Physiology, Floral Design, and Floriculture - Cut Crops. The response

group appears to have abdicated rating any course not directly related to their business lower than three or feels very strongly that the courses rated at the top of the scale deserve to be categorized in this manner.

The attitude of the responding group does not express optimism for employment in these segments of the horticulture industry. A profile indicates that in 75-90 percent of the cases the group did not respond to the question, "What type of position does your firm have or could you offer a graduate?". The largest portion of those responding (45 percent) indicated that they have or could offer a position as a Trainee. Sixty percent of those responding would offer a salary of \$6,000 to \$10,000 per annum, and approximately 37 percent would grant annual salary increases of from 5 to 10 percent; the projected rate of inflation is from 7 to 10 percent. Thirty percent said they would increase salaries by less than 5 percent per year.

II. CONCLUSIONS

The sample response group participating seems representative of that portion of the industry about which data was needed and the sample appears large enough to satisfy the requirements.

The respondents indicated a strong satisfaction with the course content of this core group of courses and the skills and competencies shown by graduates at the B.S. level by the land grant universities of the southeastern United States. There is no basis in the data produced which would commend curricula change in any of the course areas covered

by the research, unless one considered the relatively low evaluation given the course in Floral Design sufficient reason for discontinuance. Taking this reasoning further there is an indication in the respondents' predictions of levels of employability of graduates in significant numbers that curricula emphasis should be shifted to preparation of students for careers in other areas. Areas of potential employability that could be considered include Landscape Design and Contracting, Public or Botanical Garden management, Recreation Area management, Urban Landscape installation and Management, and reclamation and restoring of disturbed land areas to include those damaged by strip mining and quarrying.

It can be concluded that large numbers of attractive opportunities do not exist in this segment of the industry for the B.S. graduate. Some opportunity exists of course in a family situation or for the individual who is willing to accept low pay in exchange for experience with the intent of going into business for himself in a few years. The salary ranges offered by the group are not competitive with other offerings for B.S. graduates. In the Federal and State government, entry level salaries, according to U.S. Department of Labor representatives, range from a low of \$10,000 to a high of \$14,000 and teaching salaries for B.S. level graduates are in approximately the same range, depending on geographical location.

The number of respondents (23) participating in work-study programs is encouraging and it is concluded that this is the primary means by which industry's plea for practical experience can be met rather than by the dilution of academic course work to an unacceptable level.

Participation by industry in work-study programs can be a meaningful and valuable approach when carefully coordinated and supervised by the employer and the institution cooperating. Completion of such a program must satisfy the academic standards established as well as providing the participating business with a capable trainee who is diligent in both his studies and their application to the needs of the participating business.

Considering the growth of the field and the number of graduates being produced at the B.S. level, more research is indicated in this area. Additional segments of the industry from different geographic areas and from other areas of career potential should be surveyed with the same or an equivalent instrument.

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REFERENCES

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APPENDIXES

APPENDIX A



The University of Tennessee
INSTITUTE OF AGRICULTURE

Department of Ornamental Horticulture
and Landscape Design
P.O. Box 1071
Knoxville, Tennessee 37901

Dear

I am a graduate student at the University of Tennessee in the Department of Ornamental Horticulture and Landscape Design. My thesis research is on an unusual aspect of Horticulture and I would like some assistance from your department.

I have found a very strong indication on the part of former undergraduate students that the skills they had acquired were not being properly considered when they undertook a job search to begin their career. They feel that they are not being given the opportunity by employers to apply these skills during the early phase of their career. Discussions with students at other schools and with prospective employers at professional meetings have served to confirm that this subject deserves investigation.

Initially I will develop a matrix or composite of educational experiences for the typical Baccalaureate graduate based upon the core curriculum from 10 land grant university level institutions in the southeastern United States. When the composite is compiled, a list of competencies or skills possessed by the average graduate will be formulated. This listing will be submitted to prospective employers through their professional associations for review and comment concerning the relative value of the skill based upon a standard evaluation table. The listings of competencies and the data collected for analysis will be organized by a crosstabulation computer program.

Would you please provide me with Departmental Course descriptions and information regarding course sequences and emphases (e.g., turf, landscape design, etc.) that will be in sufficient detail so as to enable me to meld your program into the composite or matrix I have in mind. My enclosure should assist you in this regard. May I request that your response be returned to me by June 30, 1977.

May 18, 1977

Page 2

I am sure that you will have recognized that my program can be quite massive. Essentially my task will be to keep the initial study to a workable and useful degree.

I sincerely appreciate your cooperation. I feel that the study will result in some valuable conclusions that will prove helpful to all concerned. Particularly, this should be valuable to the beginning Horticulturist who should be rewarded with good career opportunities, fair and equitable remuneration, as well as the opportunity to pursue a satisfying career.

Sincerely,

Edgar L. Abbott
Graduate Assistant

ELA:nhe

Enclosure

INSTITUTION _____

COURSE #

COURSE TITLE

DESCRIPTIVE (ADDITIONAL INFORMATION AND DETAIL THAT YOU FEEL EXPANDS OR
ELABORATES UPON CATALOG DESCRIPTION)

LIST OF MAJOR SKILLS THAT YOU FEEL A SUCCESSFUL STUDENT WILL ACQUIRE
FROM THIS COURSE.

IS THIS A REQUIRED COURSE FOR ALL MAJORS IN HORTICULTURE OR IS IT PART OF
A SEQUENCE FOR A SPECIFIC AREA OF EMPHASIS?

PERSON COMPLETING THIS FORM.

NOTE: PLEASE PROVIDE A COPY OF YOUR CATALOG INFORMATION FOR RECORDS OF
THIS RESEARCH.

APPENDIX B

Course Title	1	2	3	4	5	6	7	8	9
Landscape Gardening	X		X		X	X	X	X	X
Home Grounds Management	X	X	X	X	X	X		X	X
Plant Propagation	X	X	X	X	X		X	X	2
Floral Design	X		X	X			X	X	X
Applied Floral Design			X						X
Greenhouse Management	X	X	X	X				X	X
Plant Materials - Shrubs	X	X	X	X	X	X	X	X	X
Plant Materials - Trees	X	X	X	X	X	X	X	X	X
Plant Materials - Herbaceous	X	X	X	X		X	X	X	X
Landscape Design I			X		X	X	X	X	X
Landscape Design II					X		X	X	X
Park Design			X	X			X	X	
Landscape Contracting & Maintenance			X				X		
Nursery Management - Retail	X	X	X	X	X		X	X	X
Nursery Management - Wholesale	X	X	X	X	X	X	X	X	X
Turf Management I		X		X		X	X	X	
Turf Management II						X	X	X	
Golf Course Design								X	
Floriculture (cut)	X	X	X	X	X	X	X	X	X
Floriculture (pot)	X	X		X	X	2	X	X	X
Horticulture Business Management								X	X
General Horticulture	X	X	X		X		X		X
Indoor Plant Science	X					X			

[illegible]

APPENDIX C

Course Title	1	2	3	4	5	6	7	8	9
Landscape Gardening	X		X		X	X	X	X	X
Home Grounds Management	X	X	X	X	X	X		X	X
Plant Propagation	X	X	X	X	X		X	X	2
Floral Design	X		X	X			X	X	X
Greenhouse Management	X	X	X	X				X	X
Plant Materials - Shrubs	X	X	X	X	X	X	X	X	X
Plant Materials - Trees	X	X	X	X	X	X	X	X	X
Plant Materials - Herbaceous	X	X	X	X		X	X	X	X
Landscape Design I			X		X	X	X	X	X
Nursery Management - Retail	X	X	X	X	X		X	X	X
Nursery Management - Wholesale	X	X	X	X	X	X	X	X	X
Floriculture (cut)	X	X	X	X	X	X	X	X	X
Floriculture (pot)	X	X		X	X	2	X	X	X
General Horticulture	X	X	X		X		X		X
Principles of Vegetable Production	X	X		X	X		X		X
Principles of Fruit Production	X	X	X	X	X		X		X
Advanced Fruit Production	X	X	X	X			X		X
Post Harvest Physiology	X	X	X		X		X		2

APPENDIX D



The University of Tennessee
INSTITUTE OF AGRICULTURE

Department of Ornamental Horticulture
and Landscape Design
P.O. Box 1071
Knoxville, Tennessee 37901

Dear Member of the Southern Nurserymen's Association:

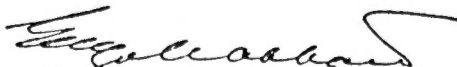
I would like to request that you take a few minutes of your valuable time to answer a few questions about your business and your attitudes on the educational experiences of graduates of southeastern land grant universities in the field of horticulture.

I realize that there are times when you feel that you are "over surveyed" but as you go through these pages giving me your opinions I think you will find that this effort is different and should lead to some conclusions that can be reported back to you through your professional association publications. The enthusiastic support of Mr. Thomas L. Henegar, Executive Secretary of the SNA in arranging for this mailing list is much appreciated.

You can be assured that your reply and all identification of individual responses will be considered confidential and that only the cumulative responses will be published. I urge that you return this survey to me this week in the enclosed postage paid envelope. Please be completely objective and candid.

Thank you for spending your time in this effort. I trust you will consider it well spent when the final conclusions are reached and when appropriate published for your information.

Sincerely,


Edgar L. Abbott
Graduate Student

ELA:nhe

Enclosures: Letter - SNA
Questionnaire



The University of Tennessee
INSTITUTE OF AGRICULTURE

Department of Ornamental Horticulture
and Landscape Design
P.O. Box 1071
Knoxville, Tennessee 37901

Dear Member of the Society of American Florists:

I would like to request that you take a few minutes of your valuable time to answer a few questions about your business and your attitudes on the educational experiences of graduates of southeastern land grant universities in the field of horticulture.

I realize that there are times when you feel that you are "over surveyed" but as you go through these pages giving me your opinions I think you will find that this effort is different and should lead to some conclusions that can be reported back to you through your professional association publications. The enthusiastic support of Mr. Jim Wanko, Assistant Executive Vice President of the SAF, in arranging for this mailing list is much appreciated.

You can be assured that your reply and all identification of individual responses will be considered confidential and that only the cumulative responses will be published. I urge that you return this survey to me this week in the enclosed postage paid envelope. Please be completely objective and candid.

Thank you for spending your time in this effort. I trust you will consider it well spent when the final conclusions are reached and when appropriate published for your information.

Sincerely,

Edgar L. Abbott
Graduate Student

ELA:nhe

Enclosures: Letter - SAF
Questionnaire



Figure D.1. Survey of horticultural industry segments in the Southeastern United States.

Card No.

Respondent No.

FLORICULTURE COURSES
(Cut and Pot Flowering Materials)

Completion of these courses should enable the student to:

1. Understand and practice the production of major commercial cut and pot flower crops.
2. Plan the rotation of crops to maximize production schedules.
3. Prepare and manage soil and soilless mixtures including soil testing.
4. Manage fertilization, watering, growth regulation, insect and pest controls, optimize light and temperature needs, etc.
5. Harvest and prepare crops for shipment and marketing.
6. Analyze production costs and consider alternative options or methods to obtain optimum cost relationships.
7. Become aware of sources of information for continuous adoption of improved practices.

Essential	Important Not Essential	Useful	Useful but not Necessary

1	2	3	4	5

POST HARVEST PHYSIOLOGY

Completion of the course will enable the student to:

1. Understand the chemical and physiological changes that occur during harvesting, handling, packing, transportation, and storage of horticultural crops.
2. Recognize the preharvest and postharvest conditions which influence these changes and prescribe methods of coping with the undesirable effects on crop material.

Essential	Important Not Essential	Useful	Useful but not Necessary

PRINCIPLES OF FRUIT PRODUCTION

Completion of the course will enable the student to:

1. Understand fruit bud formation, rest period, and water relations.
2. Control soil conditions and fertilization to optimize response of major varieties.
3. Understand planting, production, harvesting, storage, packing and marketing of fruit crops.
4. Provide protection against freezing of tissues and means of avoiding injury and disease and insect damage.
5. Know pruning principles and practices used to maximize production.

Essential	Important Not Essential	Useful	Useful but not Necessary

15
16
17
18
19

PRINCIPLES OF VEGETABLE PRODUCTION

Completion of the course will enable the student to:

1. Know the growth habits of vegetable crops.
2. Know the climatic requirements of vegetable crops.
3. Be capable of preparing soil for vegetable crops.
4. Be capable of fertilizing, controlling pests and diseases in vegetable crops.
5. Have knowledge of harvesting stages, procedures, storage, marketing vegetable crops.
6. Be able to plan cropping and to cost account for the growing seasons.

Essential	Important Not Essential	Useful	Useful but not Necessary

20
21
22
23
24
25

SECTION III.

This portion of the survey is intended to give us some insight into the qualities you would find desirable in a B.S. graduate in ornamental horticulture.

Rate each of the following in order of importance.
(Most important rate 4, least important rate 1.)

Grades	_____	_____	26
Practical experience	_____	_____	27
Horticulture theory	_____	_____	28
Enthusiasm	_____	_____	29

How do you rate the importance of each of the following areas of study in a student's background?
(Most important rate 4, least important rate 1.)

Landscape Gardening	_____	_____	30
Home Grounds Management	_____	_____	31
Plant Propagation	_____	_____	32
Floral Design	_____	_____	33
Greenhouse Management	_____	_____	34
Plant Materials - Shrubs	_____	_____	35
Plant Materials - Trees	_____	_____	36
Plant Materials - Herbaceous	_____	_____	37
Landscape Design	_____	_____	38
Nursery Management - Retail	_____	_____	39
Nursery Management - Wholesale	_____	_____	40
Floriculture (cut)	_____	_____	41
Floriculture (pot)	_____	_____	42
General Horticulture	_____	_____	43
Principles of Vegetable Production	_____	_____	44
Principles of Fruit Production	_____	_____	45
Advanced Fruit Production	_____	_____	46
Post Harvest Physiology	_____	_____	47

If you wish, we would consider comments you would care to make on the importance of training in other areas not covered in previous questions.

Employment of Graduates

What type of position does your firm have or could you offer a graduate?

Sales	_____	_____	48
Production Manager	_____	_____	49
Assistant Manager	_____	_____	50
Specialized Manager	_____	_____	51
(e.g. crop manager, propagator)	_____	_____	
Trainee	_____	_____	52

What beginning salary range?

6 - 8,000 annually	_____	_____	52
8 - 10,000 annually	_____	_____	53
10 - 12,000 annually	_____	_____	54
12 - 14,000 annually	_____	_____	55
14 - 16,000 annually	_____	_____	56
over 16,000 annually	_____	_____	57

What percentage would you increase salary annually as a graduate becomes experienced?

0 - 2%	_____	_____	59
2 - 5%	_____	_____	60
5 - 10%	_____	_____	61
over 10%	_____	_____	62

Do you currently participate in a work-study program with a university or college?

Yes	_____	_____	63
No	_____	_____	64

If yes, for what level of student?

High school	_____	_____	65
Undergraduate 2 year college	_____	_____	66
Undergraduate 4 year college	_____	_____	67
Graduate Student	_____	_____	68

Comment on the reason why not if such a program is now available to you.

Card No.

1

Respondent No.

2

3

4

5

In order to establish a framework for responses to this survey we need some information about your business.

Response Prepared by _____

Business address _____

SECTION I. (Check the most appropriate box.)

What category of business is it?

Nursery, Wholesale	☐	6
Nursery, Retail	☐	7
Nursery, Wholesale and Retail	☐	8
Greenhouse, Wholesale	☐	9
Greenhouse, Retail	☐	10
Greenhouse, Wholesale and Retail	☐	11
Garden Center, Retail Sales	☐	12
Garden Center, Wholesale and Retail Sales	☐	13
Supplier, Wholesale Only	☐	14
Supplier, Wholesale and Retail	☐	15

What size is your business (physical)

Nursery (acreage)	0 - 5	☐	16
	5 - 10	☐	17
	11 - 20	☐	18
	21 - 50	☐	19
	51 - 100	☐	20
	over 100	☐	21

Greenhouse (sq. ft.)	0 - 15,000	☐	22
	15 - 30,000	☐	23
	30 - 50,000	☐	24
	50 - 100,000	☐	25
	100 - 200,000	☐	26
	over 200,000	☐	27

Garden Center (sq. ft. interior)	0 - 500	☐	28
	500 - 1000	☐	29
	over 1000	☐	30

(sq. ft. exterior)	0 - 1,000	☐	31
	1 - 5,000	☐	32
	5 - 10,000	☐	33
	10 - 40,000	☐	34
	over 40,000	☐	35

Supplier (sq. ft. interior)	1 - 2,000	☐	36
	2 - 10,000	☐	37
	10 - 20,000	☐	38
	over 20,000	☐	39

Card No.

Respondent No.

1
2 3 4 5

PLANT PROPAGATION

Completion of the course will enable the student to:

1. Understand the science and practice of propagating plant materials.
2. Be capable of propagating by the use of grafting, budding, cuttage, division, layerage, and germinating seeds for primarily commercial production.
3. Manage the environmental needs and development of propagated material to the stage of final placement in residential or public areas.
4. Manage the protection of propagated material against pests.

Essential	Important Not Essential	Useful	Useful but not Necessary

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7
8
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HOME GROUNDS MANAGEMENT

Completion of the course will enable the student to:

1. Successfully transplant trees, shrubs, bedding plants, ground covers, etc.
2. Perform minimal propagation of the above plant materials.
3. Manage the home landscape including pruning, fertilizing, control of pests, watering, etc.
4. Manage lawn areas.
5. Use tools and associated equipment.
6. Plan effective color displays throughout the growing season.
7. Identify major native and non-native plants and cultural requirements.

Essential	Important Not Essential	Useful	Useful but not Necessary

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LANDSCAPE GARDENING

Completion of the course will enable the student to:

1. Identify and know the cultural requirements of major plant materials used in the landscape.
2. Know the design values of the plant materials used in the landscape.
3. Be capable of installing plant materials considering environmental needs and protection against hazards of weather, and pests.
4. Prepare basic designs for residential properties using valid design principles.
5. Understand management practices for post-installation growth and development of the landscape.
6. Be familiar with construction materials and their uses for patios, decks, planters, etc.

Essential	Important	Not Essential	Useful	Useful but not Necessary

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PLANT MATERIALS - ORNAMENTAL SHRUBS AND VINES

Completion of the course will enable the student to:

1. Identify the major shrubs and vines used in landscaping.
2. Understand the origin and classification of shrubs and vines used in landscaping.
3. Understand the adaptation and use of shrubs and vines used in landscaping.
4. Appreciate the design values of shrubs and vines used in the landscape.
5. Understand the environmental needs of shrubs and vines used in landscaping and protection against pests.

Essential	Important	Not Essential	Useful	Useful but not Necessary

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PLANT MATERIALS - HOUSE PLANTS

Completion of the course will enable the student to:

1. Identify and classify the major groups and varieties of plants used in the home and public interior spaces.
2. Be capable of propagating and satisfying the cultural needs of house plants.
3. Be capable of combining the cultural needs of house plants with interior design placement of major categories of house plants considering size, texture, and arrangement in containers, planters, etc.
4. Be capable of controlling pests of house plants.
5. Know the history, origins and classification of these plants and their cultivation requirements.

Essential	Important Not Essential	Useful	Useful but not Necessary

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PLANT MATERIALS - ORNAMENTAL TREES

Completion of the course will enable the student to:

1. Identify the major native ornamental trees used in the landscape.
2. Identify the major non-native ornamental trees successfully adapted and used in the landscape.
3. Know the history, origins and classification of these trees and their cultivation requirements.
4. Appreciate and be capable of using the design characteristics and values of the trees used in landscaping.
5. Understand the environmental needs of ornamental trees used in the landscape and the protection of these trees against pests.

Essential	Important Not Essential	Useful	Useful but not Necessary

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LANDSCAPE DESIGN

Completion of the course will enable the student to:

1. Be capable of perceiving design in three dimensions.
2. Understand and apply elements of design.
3. Understand plant and structural material and their uses in design.
4. Be capable of estimating costs.
5. Be capable of calculating landscape parameters.
6. Prepare landscaping specifications.
7. Design, present and develop properties.

Essential	Important Not Essential	Useful	Useful but not Necessary	
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FLORAL DESIGN

Completion of the course will enable the student to:

1. Successfully design basic arrangements including such items as table arrangements, corsages, etc. for commercial uses.
2. Understand and practice the construction of arrangements consistent with accepted design principles.
3. Understand the physiology of plant material preservation.
4. Understand and practice arranging floral materials for special holiday and occasion marketing.
5. Understand the principles involved in preparing arrangements for judging and competitions.

Essential	Important Not Essential	Useful	Useful but not Necessary	
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WHOLESALE NURSERY MANAGEMENT

Completion of the course will enable the student to:

1. Understand nursery soils.
2. Understand plant propagation.
3. Understand field production practices.
4. Understand harvesting operations.
5. Understand shipping, storage, protection.
6. Understand tools and equipment.
7. Understand labor management.
8. Understand laws and regulations pertaining to nurseries.

Essential	Important Not Essential	Useful	Useful but not Necessary

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RETAIL NURSERY MANAGEMENT

Completion of the course will enable the student to:

1. Be able to select locations for retail outlets.
2. Be able to design layout of garden center.
3. Understand production of woody plants.
4. Understand buying, sources, shipping, etc.
5. Understand rules and regulations affecting a business.
6. Understand advertising and promotions.
7. Understand basic landscape design.
8. Understand people-plant relationships.

Essential	Important Not Essential	Useful	Useful but not Necessary

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Essential					
Important					
Not Essential					
Useful					
Useful but not Necessary					

1. Possess a working knowledge of fundamental plant processes.
2. Know the influence of light, temperature, nutrients upon vegetative growth and reproduction of horticultural plants.
3. Understand production practices, harvesting, storage, of the principal ornamental, and in some cases, fruit and vegetable, crops.
4. Understand the role of horticulture in improvement of the environmental quality, economics and aesthetics of the landscape and in nutrition and medicinal uses.

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Essential						
Important Not Essential						
Useful						
Useful but not Necessary						

1. Grow greenhouse crops.
2. Design and construct hobby and commercial greenhouses.
3. Understand and manage the effects of light intensity, light duration, temperature, water and nutrients on greenhouse crops.
4. Understand and manage the heating, cooling, ventilation, circulation, watering and fertilizing systems used in the greenhouse.
5. Understand and manage the various soil or soilless media used for growing greenhouse crops.
6. Understand and manage spray programs and application systems used to control insects and diseases in the greenhouses.

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VITA

The author, Edgar Lee Abbott, was born in Queens County, New York, on August 5, 1920. He graduated from Newtown High School in 1938. He was employed by the Bureau of Advertising of the American Newspaper Publishers Association until January, 1941, when he entered the military service. He served in the Army Air Corps and the United States Air Force until July, 1970, when he retired as a Colonel. He was granted the degree of Bachelor of Science in Business by The George Washington University, Washington, D.C.

He was employed by the State University of New York at Binghamton, N.Y., from July 1970 until July, 1975, as Director of Personnel and Employee Relations and served as Chairman of the Advisory Committee on Personnel and Labor Relations Matters to the Chancellor of the State University of New York from 1973-1975.

In September of 1975 he enrolled in the University of Tennessee as an undergraduate in Ornamental Horticulture and Landscape Design and entered Graduate School in 1976. He was employed as a Graduate Teaching Assistant during the period of Graduate Study. He was awarded the Master of Science Degree with a major in Ornamental Horticulture and Landscape Design, December 8, 1978.

He is a member of Alpha Sigma Lambda and The American Society for Horticultural Science; The American Garden Writers Association, The American Horticultural Society and is a past member of The American

Management Association, The National Association of College and University Business Officers, and the College and University Personnel Association.

He was awarded the Legion of Merit and other military decorations and citations including the Award of the Distinguished Service Medal of the State of New York.

He is married to the former Peggy Morrison of Birmingham, Alabama, and they are the parents of Peggy Lee Huff, Kathleen Diane Abbott, and Patrick Dean Abbott.