AN ADAPTATION OF A COURSE FOR TELEVISION TEACHING OF HORTICULTURE

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A THESIS

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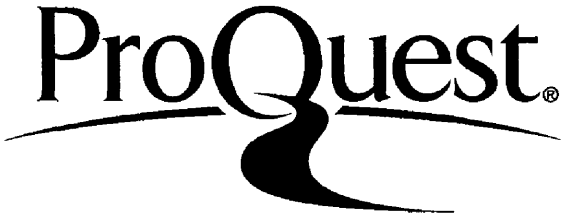

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SUMMARY

Professional horticulturists have an opportunity and a responsibility through the medium of television to educate producers and consumers in the utilization of fruits, flowers, vegetables, and ornamental plants.

In the past, educational television has drawn upon related areas, such as radio, theater, motion picture industry, audio-visual education, and commercial television, for its techniques and talent which have resulted in a quantity of writing which was chiefly interpretation. Most of the research in television has been provided by the United States Department of Defense and the United States Department of Agriculture.

As soon as several ultra high frequency stations were designated for education, there was more opportunity for research in educational television. The present project was designed therefore, to adapt a lecture-laboratory course in Horticulture to an effective telecourse; to make a quantitative study of the use of scientific terminology in television teaching.

After making an appraisal of the course content and surveying the technique of presentation in the classroom and laboratory, the subject material and lecture topics were regrouped under the following ten popularized program titles: Plan Your Garden First, Always Prepare Your Garden, Know

Your Annual Flowers, Better Buy Bulbs, Use Trees and Shrubs, Know Your Perennial Flowers, Grow 100 Roses, Have Your Own Orchard, Don't Have Insects and Diseases, and Take Advantage of Your Setting.

Formats, including descriptions for the sets, audio-video instructions, and the items to be presented were prepared for each program.

Visual aids were selected for the purpose of clarifying the subject matter and to demonstrate the various types of visual aids adaptable to horticultural topics.

The average total cost for each program including time for adaptation, visual aids, and the use of the studio, was $293.14. The production of one program as a basis for calculation showed that 12.6 man-hours were required for the preparation and presentation.

A syllabus was provided to serve as a study guide, as a record of assignments and to furnish special information for the programs on annuals, perennials, and bulbs.

Each of three matched groups of students was exposed to a program containing 15, 20, or 25 specialized horticultural terms without the addition of superimposed labels of these terms which were projected for testing purposes. Each of three identical groups was exposed to the same program with the addition of superimposed terminology. Results of the tests which were designed and provided for the test groups showed that there was no alteration in the percentage

of terms comprehended or recalled as a result of increasing the number of terms from 15 to 20 to 25. The number of terms comprehended was in direct proportion to the number supplied and therefore more information was comprehended equally as well from an increase in the number of terms used.

The use of superimposed terms improved the ability to recall the terms only when 20 terms were used. It was recommended therefore that the use of superimposed terms was of limited value.

Further research would be required to determine the optimum number of scientific terms for a 30-minute telecast teaching horticulture.

INTRODUCTION

The raising of living standards as a result of research in the production and marketing of horticultural crops has been the responsibility of professional horticulturists for many years. The producer and consumer have been dependent on horticulture not only for their fruit, flowers, vegetables and ornamental plants, but also as a means of expressing much of their creative ability. It was equally important that the horticulturist share his responsibility with the agriculturist in an attempt to educate people in the utilization of this information. As long ago as 1909, Bailey was cognizant of this responsibility when he maintained that "the teaching of agriculture ought not to be confined to colleges of agriculture" and that "the college must be taken to the people". Following the establishment of state colleges of agriculture and military science (Morrill Act, 1862) and the establishment of state experiment stations (Hatch Act, 1887) the extension service was begun (Smith-Lever Act, 1914).

Few methods for the dissemination of horticultural information have been more promising than the establishment of television stations at colleges of agriculture. The increasing use of television has served to augment the existing methods of agricultural extension. This was natural, considering the original purpose of the Smith-Lever Act: "To aid in diffusing among the people of the United States

useful and practical information on agriculture and home economics and to encourage the application of the same through field demonstrations, publications, and otherwise."

Horticultural education has a broad and colorful appeal especially when it is provided through a medium which offers close contact with the instructor and reaches both general and specific audiences at the same time.

Considering the future possibilities of universities using the medium of television for teaching, the present study was designed to adapt an existing university course in horticulture to television and to make quantitative measurements of the use of scientific terminology in television teaching of Horticulture.

PAST CONTRIBUTIONS TO EDUCATIONAL PROGRAMMING

Impact on Society. The literature in the area of educational television has covered a broad scope, but fundamental research on this subject has not been extensive. Educational television has been considered to be a related art and has drawn upon radio, theater, motion pictures, audio-visual education, and upon commercial television for its personnel and techniques (Vincent, Ash, and Greenhill, 1949, SDC Report 269-7-7; New, not dated). Contributions from these related fields have produced a large quantity of writing, must of which had been interpretation or opinion in related areas but not research in television.

Since educational television was given consideration with the designation of 242 ultra high frequency channels specifically allocated for education on April 14, 1952 (Emery, 1953), the impetus for fundamental research has been inspired. Along with the use of the medium by educators has been the recognition of many problems.

Recognizing television as an effective and efficient tool for communication, several universities have begun to use this medium (Emery, 1953).

In 1952 Hunter projected the use of television as a responsibility of a university when he said, "Television as a medium of communication, a method of transmission, is by its nature a part of the process and means by which educa-

tion must fulfill its prupose and discharge its obligation to society."

Advances made in raising the general welfare of society have been direct functions of the efficiency of a system of enlightening the people (Kersta, 1946). The development of the use of television has been reflected by the changing patterns of home life (Shane, 1950). It has been shown that the family is more selective in its choice of magazines and newspapers, entertains more friends and larger groups of children more frequently (Battin, 1950). This has provided an opportunity to project more education into the home. Behnke maintained in 1953 when greater public understanding of science and its aims were of utmost importance, that scientists have an opportunity to establish educational television in an effort to supplant programs of lesser significance.

As an Aid to Education. Educational television has not been a substitute for classroom instruction, but rather it has been a technique for extending education and enhancing existing methods of instruction. Wigren (1952) in clarification of this concept, believed that in the broadest sense an educational television program could be used to mean any television program which caused the individual to respond by bringing about a desirable change in his behavior. Wigren indicated that the educator has been interest-

ed in projecting subject material in a specific area which needed to be a planned learning situation purposefully prepared. Such planned learning situations have been designated by him as educational television programs.

Two broad classifications of educational television have been described by Emery (1952): the "in classroom" program which aided in giving vision to intricate demonstrations and was significant as an interest gaining device; the "out of classroom" television described as programs designed for home viewing, not only for direct education, but also for parent education of the activities inside the school (Shayon, 1952).

The costs of establishment of television studios and employing skilled television personnel have been high (Moreland, 1946). To utilize the medium most effectively, Moreland maintained that it was necessary to develop an understanding of the limitations as well as the opportunities of television. The educator has had to be in a position to handle the larger costs of production, heavier demand of the time of all concerned, and the necessity of closer adherence to professional standards of production (Moreland, 1946). Wigren (1952), indicated that educational programs, if designed by educators, have had a greater chance for success because educators have had professional competency to understand the principles of human growth and development, the needs and interests of learners, and the ways in which learn-

ing takes place. He said that programs must be planned to create a learning situation and with teaching as a direct objective.

Schreiber (1952) indicated that television learning was comparable to film learning because both television and sound movie films appealed to the senses of sight and hearing.

A comparative study of the effectiveness of instruction by television, television recordings, and conventional classroom procedure was conducted at Fordham University for the Special Devices Center of the United States Navy. This research demonstrated conclusively that television as an audio and video medium could be superior to other methods. Under the conditions outlined in the resulting naval report, it was found that television was better than classroom instruction in 50 percent of the comparisons made. Another 38 percent were of value equal to classroom instruction. Kinescopic recordings of television programs were found to be more effective for instruction than classroom lecturing in 75 percent of the comparisons (Rock, Duval, and Murray, not dated, SDC Report 476-02-2).

Further study by the Special Devices Center has demonstrated that learning from kinescopes of "live" television programs was more successful as a teaching aid than were regular instructional films. In all exposures within the study, kinescopic recordings provided a higher learning

level than when the test groups knew they were viewing a regular moving picture film.

Wilson (1951) reported a sewing course which was conducted by the United States Department of Agriculture. Demonstrations were successful in communicating ideas and practices regardless of age, educational training, and amount of sewing practice of the viewers. He also indicated that since the test group consisted of non-college people, the medium had high potentialities for adult education. Attitude change as a result of more knowledge was demonstrated by Berninger and Watson, (1954). They noted that a change of attitude from "unfavorable" to "favorable" was a significant step in motivation -- one of the purposes of education.

Wilson and Moe (1951) and Battin (1954) established the importance of the opportunity for television to reach a variety of audiences. Children spent 11 percent of the 168 hours available for viewing all types of television (Battin, 1954). More of this time might be utilized with educational programs because Wilson (1951) reported that of his test group, 83 percent were very much interested in viewing educational programs.

The "sight-sound" pictures at the University of Iowa were among the first programs of educational television (Kurtz, 1934). Kurtz was very enthusiastic about this programming especially when he was able to identify leaves of trees projected through the medium of television. After al-

most 20 years of technical improvement and increased use of television, 45 universities and colleges were offering instruction by television (Fritz, et al, 1952).

Teaching has been highly successful in universities where programs of educational television have been provided (Cassel, Rochte, Gahle, Beak, Williams and Brown, 1954). These university instructors found that the level of performance of the students has been equal, or better than the performance of the regular classroom students. They indicated that courses offered by the six universities they represented, provided credit for students who met the requirements of the telecourse.

Klein (1950) suggested that one television channel be set aside for educational purposes using non-commercial entertainment, education and documentaries. Through the use of the channels made available for educational purposes, educators have recognized that television is not only a tool for education, but also an instrument for public relations (Steetle, 1952).

Educational television has been used as an extension technique. The efficiency of its use has been suggested by the Governor's Committee on Educational Television for the Commonwealth of Pennsylvania, 1953. They have reported that whereas it takes hundreds of agricultural extension workers to reach farmers in Pennsylvania, by means of television one person can reach more farmers with equal or

greater effectiveness.

The adaptation of a classroom course to television was said by Garrison (1954) to be a problem of adjusting the academic content to a visual medium. The problems were to insure a high level of learning and maintain audience interest at the same time (Chauncey, 1954). Chauncey suggested that a program be designed toward a previously established objective.

Program length has been shown to influence the level of learning, one hour of continuous broadcasting being established, by Allen (1954) as the maximum length. This concept was reenforced by the research of the United States Navy Special Devices Center (SDC Report-269-7-7) which showed that as more and more information was presented, interferences were set up which resulted in less efficient learning of any particular item (Vincent, Ash, and Greenhill, 1949).

In reports that have been published by the Joint Committee on Television Education, the scope of subject material has been broad and varied. Western Reserve University has produced teaching programs of: Literature, Psychology, Geography, Economics, Music, Biology, Dramatics, Speech, and History. The students who received credit by television home study were shown to have gained as much information as the regular student who had had the benefit of contact with the instructor in the classroom (Western Re-

serve University, 1951-1953).

It was suggested by Speece, Skelsey, and Gapen in 1953 that educational programs had to be prepared to command attention because rarely would there be a captive audience, as in a classroom. They thought that programs would have to be designed so that they would command attention comparable to programs on competitive channels, if good teaching was to be achieved. Hard and Watson (1953) reported that a dramatic type of presentation had more audience appeal than a lecture or demonstration type of presentation and was of equal value for communicating horticultural information. The Special Devices Center of the United States Navy has reported (SDC Report 476-02-3) that either narration plus meaningful film or narration combined with drama was effective as teaching procedures for television.

Visual aids played an important role in effective television programming according to Speece, Skelsey, Gapen (1953), who also indicated that visual aid should create interest, make a direct contribution, and help to clarify the subject matter. Otherwise they felt that the use of visual aids was of little value. Their other criteria for visual aids for television were motion, simplicity, durability, and transportability. Tonkin and Skelsey (1953) stated that visual aids for television should include "live" materials, motion pictures, models, still

pictures, slides, charts, and diagrams. The use of motion pictures was recommended particularly because of the opportunity provided to capture action as it happened. Hovland, et al (1949) seemed to think that motion pictures might be biased. They suggested, in fact, that educators should be cautioned to portray an unbiased point of view.

The amount of learning has been shown to be much greater when information was presented explicitly (Rock, Duva, Murray, no date, SDC Report 476-02-3). This was true when the meaning was presented directly in words, or expressed in plain words either by a dramatic sequence, or by a chart, map, or an animated cartoon.

DEVELOPMENT OF A UNIVERSITY COURSE FOR TELEVISION

Adaption of Course. A course entitled "Garden Flowers", Horticulture 328*, presented regularly in scheduled classroom and laboratory meetings during the spring term of the academic year, was chosen as a sample telecourse because of its adaptability to television (TABLE I). The subject matter and sequence of presentation was reorganized to concentrate seven scheduled lecture and laboratory hours for an average of 20 students into 30 minutes of personal instruction over television. The sequence of the lectures was arranged considering seasonal interest and an accumulative sequence of garden procedure.

It was necessary to select formats and visual aids that would make the course clear and concise. Having sifted and isolated the factual material, it was necessary to designate the content to be clarified with visual reinforcement afforded by television. The demonstration type of format was chosen because it provided an opportunity to use a larger variety of visual materials and a larger number of

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* Course Description: Horticulture 328. Garden Flowers. Spring. 5 (3-4). Identification, utilization, and culture of perennials, annuals, and other ornamental plants in the garden; professional garden care and maintenance.

TABLE I

Course Outline, Horticulture 328
GARDEN FLOWERS
April, 1953
Room 304, Horticulture

Textbook: Better Homes and Gardens Garden Book, Meredith Publishing Company, Des Moines, Iowa. Copyright 1951.

	<u>Garden Planning</u>
Lecture 1	Adaptation of a garden plan
Lecture 2	Maintenance of planting
Lecture 3	General plan of a garden
Laboratory 1	Visit to the horticultural gardens
Laboratory 2	Practical problem on garden planning
	<u>Preparation and Planting</u>
Lecture 1	Preparation of soil
Lecture 2	Planting and care of a garden
Lecture 3	Criticize any article in current garden magazine
Laboratory 1	Soil preparation
Laboratory 2	Direct seeding and division of perennials

Identification of Perennials

Lecture 1	Use and culture of perennials
Lecture 2	Use and culture of perennials
Lecture 3	Plan two perennials borders using different color
Laboratory 1	Plan of a border
Laboratory 2	Order materials

Trees, Shrubs, Lawns

Lecture 1	Utilization of trees and shrubs
Lecture 2	Maintenance of a lawn
Lecture 3	How to establish a good lawn
Laboratory 1	Prune shrubs and trees
Laboratory 2	Campus tour

Identification of Annuals

Lecture 1	Use and culture of annuals
Lecture 2	Use and culture of annuals
Lecture 3	Design one annual border
	Design one annual and perennial border using 20 annuals and 15 perennials
Laboratory 1	Plan of a border
Laboratory 2	Order perennial plants

Use and Planting of Bulbs

Lecture 1	Identification of types
Lecture 2	Culture of bulbs
Lecture 3	Planting plan
Laboratory 1	Plant gladiolus, or rejuvenation of bulbs
Laboratory 2	Mid-term

Culture of Roses

Lecture 1	Types and varieties of roses
Lecture 2	Culture of hybrid "T" roses
Lecture 3	Order rose bushes
Laboratory 1	Prune roses or plant roses
Laboratory 2	Dust roses

Value of Home Fruit Planting

Lecture 1	Most ornamental types and varieties of fruit for Michigan Culture and planting of these fruits
Lecture 2	Dwarf trees, Espalier trees and small fruit
Lecture 3	Spraying schedule
Laboratory 1	Prune fruit trees and grapes
Laboratory 2	Plant annuals

Control of Insects and Diseases

Lecture 1	Insects and insecticides
Lecture 2	Diseases and fungicides
Lecture 3	Order spray materials
Laboratory 1	Practical problem
Laboratory 2	Visit Cooley Gardens

Specialized Gardens

Lecture 1	Window gardens, terrace gardens, roof gardens and architectural gardens
Lecture 2	Wall gardens, alpine gardens, bog gardens, and water gardens
Lecture 3	The special gardens and criticisms
Laboratory 1	Slides of special gardens
Laboratory 2	Annual garden

spontaneous motivations. Plants, diagrams, models, photographic transparencies, and moving picture films were used as visual aids to demonstrate the scope of visuals available for horticultural programming. A cost and source analysis was made for the visual aids used in each of the programs. The individual formats for the programs included the audio and video instructions. The settings were selected to minimize costs and yet maintain the proper environment and function.

The course was designed to offer through the television method university credits equal to those offered by attending regular classroom and laboratory instruction.

A syllabus written for the student viewer presented each telecast separately and included the following items: An explanation of the topics, suggestions for preps and materials to be used by the viewer during the program, a listing of terminology which was confusing or required explanation, assignments, and suggested readings for students with special interest in particular topics.

Formats for Programs.

Department of Horticulture

TELECOURSE #328 - GARDEN FLOWERS.

"Plan Your Garden First"
April 3, 1954

Scene: Opening setting for the series is a professor's office, casually decorated with pictures of ornamental trees, flowering specimens of seasonal perennial flowers, and on the desk is a collection of materials necessary for the course.

On the walls of the office of the instructor in the second setting are four pictures of garden plans. The garden model prepared for the program is located to the stage right on a castored table to facilitate varying its position. Bookcase, filing cabinet, and desk materials are added to simulate an office.

The third setting is the interior of a garden house and a work bench with a silhouetted backing for garden tools.

Introduction

AUDIO	VIDEO	TIME
Music up and under:		
Open	Slide: WKAR - Television Michigan State College	
	Slide: Dept. of Horticul- ture	

	Slide: Dept. of Horti-culture	
	Slide: Telecourse Gar-den Flowers	
	Slide: Plan Your Garden First	
	In studio - - - open on Div. Head.	
Explains new method of presenting Hort. by television and leads to scene two for introduction of instructor	Professor seated at desk on the open - - rises for exit at the end of ex-planation	
Introduction of in-structor Begin lecture	Open on set #2 Professor makes intro-duction and exits	4 min.
	Body	
Relative costs of garden construction	Cover to tight shot of garden model	12 min.
Low maintenance Suitability of plan Planting plan	Focus on border areas	

Soil types	Back to cover shot	
		4 min.
Season and color		
Care of tools and maintenance	Dolly into garage doors on model - - pick up set #3 on camera #2	
		3 min.
Assignment	Chest shot	
		3 min.
Summary	Cover to right shot	
		2 min.
	Close	
Music up and under	Slide: Plan Your Garden First	
Close copy	Slide: Telecourse Garden Flowers	
	Slide: Dept. of Horticulture	
	Slide: WKAR Television Michigan State College	

"Always Prepare Your Garden"
April 10, 1954

Scene: The opening setting, the instructor's office with the instructor seated at his desk, is dressed the same as Scene II of "Plan Your Garden First."

A laboratory for Floriculture including a potting bench, flats of soil, mulching materials, stakes, labels, and other greenhouse tools, presents the second setting. Three students are engaged in laboratory procedure.

AUDIO	VIDEO	TIME
	Introduction	
Music up and under		
Open	Slide: WKAR Television Michigan State College	
	Slide: Dept. of Horticulture	
	Slide: Telecourse "Garden Flowers"	
	Slide: Always Prepare Your Garden	
Music up to studio		1/2 min.
	Body	
Introduce topic	Open on instructor, cover shot	
Spading	Tight shot on diagram	3 min.
Music bridge to second scene	Open on second set. Cover shot	

Demonstration of soil in flats	Quick tight shots of soil in flats	3 min.
Explain watering	Bring cameras in close for close scrutiny	3 min.
Mulching Explain uses	Show various kinds of mulches	4 min.
Planting and dividing plants Instructor explains, then class repeats operation before camera	Pan plant materials	7 min.
Sowing seeds	Instructor demonstrates and goes into film	3 min.
Labels, stakes, cold frame, and greenhouse	Take a look at materials Slide: Cold frame Slide: Greenhouse	2 min.
Music bridge Assignments	Back to office Instructor seated	2 min.

Close

Slide: Always Prepare
Your Garden

Slide: Telecourse Garden
Flowers

Slide: Dept. of Horticulture

Slide: WKAR Television
Michigan State College

1/2 min.

"Use Trees and Shrubs"
April 17, 1954

Scene: Opening scene displays a garden set in early spring before the leaves have emerged from the buds of the trees and shrubs. Two shrubs of nearly mature size have been brought on the set for effect and for pruning demonstration. A lawnmower is being repaired in the foreground. In the background lawn furniture is being repainted and renovated for the new year.

Introduction

AUDIO	VIDEO	TIME
Music up and under	Slide: WKAR Television	
Open copy	Michigan State College	
	Slide: Dept. of Horticulture	
	Slide: Telecourse "Garden Flowers"	
	Slide: Use Trees and Shrubs	1/2 min.

Body

Music up and under to studio	Open on lawnmower repairs	
Instructor explains good lawn maintenance, feeding, watering and importance of careful mowing	Instructor stands and goes to lawn chair at rear of set	
		10 min.
Instructor explains the use of trees and how tree shape can add to an effective landscape	Slide #1 American Elm Sketch of leaf, fruit, tree	
	Slide #2 Sugar Maple Sketch of leaf, fruit, tree	
	Slide #3 White Oak Sketch of leaf, fruit, tree	
	Slide #4 Pin Oak Sketch of leaf, fruit, tree	
	Slide #5 Lombardy Poplar Sketch of leaf, fruit, tree	
	Slide #6 White Spruce Sketch of leaf, fruit, tree	

	Slide #7 Honey Locust Sketch of leaf, fruit, free	7 min.
Pruning is explained by instructor	Instructor explains pruning by demonstrating on studio specimens	
Rejuvenation is explained		8 min.
Assignments	Instructor returns to lawn chair	2 1/2 min.
	Close	
Music up and under Close copy	Slide: Use Trees and Shrubs Slide: Telecourse "Garden Flowers" Slide: Dept. of Horticulture Slide: WKAR Television Michigan State College	

"Know Your Perennial Flowers"
April 24, 1954

Scene: Instructor's office with five flowering specimens of perennial plants in the room. A tripod beside the desk holds five black and white diagrams of enlarged specimens of plants. On the instructor's desk is a slide Viewmaster.

Introduction

AUDIO	VIDEO	TIME
Music up and under	Slide: WKAR Television Michigan State College	
Open copy	Slide: Dept. of Horticulture	
	Slide: Telecourse "Garden Flowers"	
	Slide: Know Your Perennial Flowers	

Body

Music up and under to studio	
Instructor explains topic	Cover shot of instructor at desk
Continuous explanation of culture and use of perennials	Bring in projection and alternate shots with the studio 5 slides and then to potted specimens

10 slides from projection
5 pictures on tripod
Back to projection for remaining 5 slides

25 min.

Assignments — Cover to professor

3 min.

Close

Music up and under
Close copy

Slide: Know Your Perennial Flowers
Slide: Telecourse "Garden Flowers"
Slide: Dept. of Horticulture
Slide: WKAR Television Michigan State College

"Know Your Annual Flowers"
May 1, 1954

Scene: The lecture will be given from the instructor's office. Five specimens of flowering annuals are placed about the room. A viewmaster is on the instructor's desk and beside the desk is a tripod to support the enlarged photographs. The garden model used on the program "Plan Your Garden First," is located on the opposite side of the room.

Introduction

AUDIO	VIDEO	TIME
Music up and under	Slide: WKAR Television Michigan State College	
Open Copy	Slide: Dept. of Horticulture	
	Slide: Telecourse "Garden Flowers"	
	Slide: Know Your Annual Flowers	
Music up and under to studio		

Body

Introduction to topic	Open on instructor seated at the desk	
Explain slides of annuals	Alternate shots and movement by interspersing flowering specimens	15 min.
	Instructor goes to tripod	5 min.
Explain uses	Instructor goes to garden model	5 min.
Assignments	Instructor back to desk	3 min.

Close

Close Copy

Out of studio

Slide: Know Your Annual Flowers

Slide: Telecourse "Garden Flowers"

Slide: Dept. of Horticulture

Slide: WKAR Television Michigan State College

"Grow 100 Roses"
May 8, 1954

Scene: A garden setting. At the rear of the set is a garden fence with a rose garden behind it. A wheelbarrow with roses ready for planting is in the foreground, a garden chair is at the center and various garden tools are scattered on the set.

Introduction

AUDIO	VIDEO	TIME
Music up and under	Slide: WKAR Television	
Open copy	Michigan State College	
	Slide: Dept. of Horticulture	
	Slide: Telecourse "Garden Flowers"	
	Slide: Grow 100 Roses	

Music up and under to studio

	Body	
Instructor explains types and varieties of roses	Instructor is seated in lawn chair Limbo shot off set	
		9 min.
Purchasing roses	Film at Nursery Sales Station	
		6 min.
Pruning	Instructor moves to front of wheelbarrow	
		6 min.
Picking roses	Instructor goes to rear of set and cuts roses	
		4 min.
Assignment Music up and under Tradition of roses	Returns to lawn chair Instructor remains seated	
		3 min.
	Close	
Music up and under Close copy	Slide: Grow 100 Roses Slide: Telecourse "Garden Flowers" Slide: Dept. of Horticulture Slide: WKAR Television Michigan State College	

"Have Your Own Orchard"
May 15, 1954

Scene: Instructor's office, a garden model located center foreground simulates a proposed trip to home orchard.

Introduction

AUDIO	VIDEO	TIME
Music up and under	Slide: WKAR Television Michigan State College	
	Slide: Dept. of Horticulture	
	Slide: Telecourse "Garden Flowers"	
Music up and under to studio	Slide: Have Your Own Orchard	

Body

Instructor explains topic for the day	Instructor seated at desk	
Instructor explains Espalier	Close up of diagram	
Dwarf trees	Slide projection	15 min.
Values of planting dwarf trees	Chest shot of instructor	3 min.

Instructor explains how to grow fruit trees in limited areas	Slide projection	3 min.
Instructor explains how grapes may be used effectively	Slide projection	6 min.
Assignments	Close up of instructor	1 min.
	Close	
Music up and under Close Copy	Slide: Have Your Own Orchard Slide: Telecourse: "Garden Flowers" Slide: Dept. of Horticulture Slide: WKAR Television Michigan State College	

"Better Buy Bulbs"
May 22, 1954

Scene: The opening scene is in the instructor's office with ten types of flowering bulbs and a Viewmaster on the desk. The office is dressed the same as for the second scene, "Plan Your Garden First."

The second scene is an exterior setting of a garden. A garden box is at ground level so that it can be used to simulate the planting of the bulbs.

The closing scene is in the instructor's office using a portable blackboard to facilitate illustration of inter-planting of bulbs.

Introduction

AUDIO	VIDEO	TIME
Music up and under	Slide: WKAR Television Michigan State College	
Open copy	Slide: Dept. of Horticulture	
	Slide: Telecourse "Garden Flowers"	
	Slide: Better Buy Bulbs	
Music up to studio		
	Body	
Instructor explains topic	Instructor seated at desk	2 min.
Instructor shows various types of bulbs	Picks up bulb from desk, shows it to class, and brings in slide as example while describing the flowering habit	16 min.

Motivates switch of scene to exterior set	Collects bulbs to make exit	
Music	Open exterior set	
Instructor explains planting depth	Plants bulbs in garden box	
		5 min.
Motivate return to office	Back to office set, Cover shot of instructor and blackboard	
Explain interplanting		3 min.
Assignments		2 min.
	Close	
Close Copy	Out of studio	
	Slide: Better Buy Bulbs	
	Slide: Telecourse "Garden Flowers"	
	Slide: Department of Horticulture	
	Slide: WKAR Television Michigan State College	

"Don't Have Insects and Diseases"
May 29, 1954

Scene: Instructor's office; on one wall of the room is a display of insects and diseases together with packages of spray materials.

Introduction

AUDIO	VIDEO	TIME
Music up and under	Slide: WKAR Television	
Announce copy	Michigan State College	
	Slide: Department of Horticulture	
	Slide: Telecourse "Garden Flowers"	
	Slide: Don't Have Insects and Diseases	

Body

Music up and under to studio		
Instructor explains today's topic	Chest shot of instructor at the desk	
Instructor explains types of insects and controls	Instructor rises and goes to display	
		10 min.

Instructor explains the types of diseases	Close up shot of phlox leaves	10 min.
Spray methods are explained	Cover shot for demonstration	6 min.
Assignments		2 min.

Close

Music up and under
Close Copy
Music up and out

Slide: Don't Have Insects and Diseases
Slide: Telecourse "Garden Flowers"
Slide: Department of Horticulture
Slide: WKAR Television Michigan State College

"Take Advantage of Your Setting"

Scene: Living room. Seated about the room is a group of people attentively listening to the speaker. As the scene opens, the speaker introduces his subject and the lights are lowered.

The room is comfortably furnished. Moving pictures of gardens are projected from the rear of a transluscent screen.

Introduction

AUDIO	VIDEO	TIME
Music up and under	Slide: Michigan State College	
Open copy	Slide: Department of Horticulture	
	Slide: Telecourse "Garden Flowers"	
	Slide: Taking Advantage of Your Setting	

Body

Music up and under to studio		
Instructor explains featured garden in relation to natural and architectural settings	Cover shot of group and dolly in to speaker and then back to cover shot as light dims. Bring in projection	
Speaker concludes talk	Bring up lights and focus on speaker	
Instructor outlines program for final examinations		
		28 min.

Close

Music up and under	Slide: Take Advantage of Your Setting	

Close copy	Slide: Telecourse "Garden Flowers"
	Slide: Department of Horticulture
	Slide: WKAR Television Michigan State College

Visual Aids for Programs.

The visual aids have been selected to improve the visual parts of the television program. They have been chosen to add clarity, program interest, and working material for the instructor as he develops the subject matter. The use of the term "visual aid" has in some instances been expanded to include props because in some program presentations it is difficult to distinguish between what is necessary for the accurate representation of the subject matter and what is an added feature for comprehension.

"Plan your garden first"

A garden model (4 x 5') was designed in three dimensions to include the physical features of a suitable flower garden. This model included the house, topography of the land, and existing trees. The general layout of the garden gave the relative location of the various areas. The flower borders were demonstrated by the use of overlays added during the progress of the program.

The garden model was constructed on a plywood base to give strength and durability. The house and garage were made from lightweight balsam wood and were oriented in their permanent positions on the base. A low grade plastic sponge was shaped to form the trees. The topography was represented by pasting paper over meshed wire at the required levels. Grassed areas were simulated by sprinkling green sweeping compound on elastic glued surfaces.

Driveways and sidewalks were made of light grey, finely ground slate. The shrubs and evergreen plantings were represented by parts of the following dried weeds and woody plants: Golden Rod (Solidago canadensis), Boxwood (Buxus americana), Globe Thistle (Echinops ruthenicus), and Teasel (Dipsacus fullonum). These materials were sprayed with household vegetable dyes to produce good black and white contrast for television reproduction.

The flower beds were made of construction paper varying in shapes to demonstrate how interest could be achieved by varying the line design.

The garage doors were constructed so that they could be opened to reveal the garden tool shop inside. By dollying the camera into this setting and duplicating a similar set in the studio, it would be possible to give the illusion of actually entering the tool storage area. A garden rake, hoe, pruning saw, shovel, spading fork, edging tool, trowel, pruning clipper, and a brush rake were hanging on a silhouetted surface to show each tool in its place. Included in the set was a conveniently located five gallon can of oil, a wheelbarrow, garden hose, and other small miscellaneous tools.

"Always prepare your garden"

Proper turning of the soil was demonstrated by use of a large diagram which showed both the principles of the operation and the effects of digging. Yellow, brown and

green inks were used to give adequate quality of black and white reproduction. The diagram included the angle of the soil slice made by the spade, the loosening of the soil, and the location of the manure and fertilizer.

Good tilth was illustrated in the studio by a friable, moderately moist soil. A puddled soil with very little organic matter was used to demonstrate contrasting poor tilth. By placing sandy soil and a clay soil in a glass column, the changing of the soil color showed how much water was absorbed and the depth and rate of water penetration.

Types of mulches were represented by straw, buckwheat hulls, and pulverized corn cobs and the depth of application of the mulches was shown in a garden box.

Living peonies (Paeonia officinalis), Iris (Iris germanica), and Chrysanthemum (Chrysanthemum morifolium) were used to demonstrate types of storage organs and the method of division for propagation.

Sowing of seeds was shown in relation to soil moisture and the contact of the seed with the soil. Germination and the emergence of the seed from the soil was illustrated by a 15-second animated film.

Three different types of labels were used, the painted wooden stake with the name stencilled on it vertically, the cross-bar type with a metal plate, and the glass vial type with a wire standard.

A prepared slide of a conventional type of cold frame illustrated the method of growing plants early in the spring. A kodachrome slide of the interior and exterior of a garden greenhouse illustrated the possibility of its use in garden work.

"Know your annual flowers"

Kodachrome slides were selected after evaluating their reproductive quality through the television system. Sharp contrast between the flower and the background was essential.

Black and white photographs were printed on coarse textured paper in proportion to the ratio of the dimensions of the television screen.

Flowering plants were grown in six-inch pots and were timed to be in flower on date of the program. The border designs for these flowers were illustrated by using the same paper overlays used in the program. "Planning your garden first".

"Better buy bulbs"

Tulip (Tulipa Gesnariana), Poet Narcissus (Narcissus poeticus), Crocus (Crocus Imperati), Hyacinth (Hyacinthus orientalis), Muscari (Muscari armeniacum), Scilla (Scilla atrocoerulea), Chionodoxa (Chionodoxa Luciliae), Lily (Lilium Speciosa), Snowdrop (Galanthus nivales), and Fritillaria (Fritillaria meleagris) served as examples of bulbs. The flowers and the flowering habit was shown by Kodachrome

slides. The bulbs were planted in a garden box in front of the camera so that the viewing audience could see the position of the bulb as well as the depth of the planting. Interplanting was shown by blackboard sketches of a perennial border.

"Use trees and shrubs"

Black drawings of tree outlines on yellow cardboard were used to illustrate the shapes of some trees.

Kodachrome slides of living specimens were superimposed over these basic shapes to give the total effect of the various trees.

Pruning techniques for shrubs were illustrated by a diagram with a celluloid overlay. All of the branches to be cut off were painted on the transparent celluloid. When the celluloid was removed, the effect of pruning the shrub was clearly visible.

"Know your perennial flowers"

The kodachrome slides were made in natural settings to demonstrate the use of each perennial. Black and white prints were enlarged and mounted on illustration board. Potted plants were in flower so that closeup shots could be taken to identify the flowers.

"Grow 100 roses"

Four types of roses were illustrated by the "limbo

shot" technique. Typical examples were selected from a nursery catalog and the same page was duplicated before another camera taking the close shot of the pictures in the catalog. By alternating from one camera to the other, the viewer was able to follow the demonstrator and have the feeling of actually reading the catalog.

Two dormant hybrid tea rose bushes were used to contrast good and poor quality. A five minute motion picture film was prepared in the greenhouse to show the planting, pruning, watering, and winter protection of roses. A rose bush was used in the studio to indicate the proper method of cutting a flower.

"Have your own orchard"

Kodachrome slides of apple (Malus Pumila), peach (Prunus persica), cherry (Prunus cerasus), and plum (Prunus japonica) in flower were used to convey the ornamental value, the use, and care of fruit trees in the home flower garden.

The espalier fruit tree was illustrated by a diagram showing how the tree was grown, trained and maintained.

Two kodachrome slides were used to show the grape arbor, the trellis, and the 4-cane Kniffen system of pruning grapes.

"Don't have insects and diseases"

A model of an aphid (100x actual size) was constructed of balsam wood blocks to show the manner by which a suck-

ing insect attacks a plant, and to demonstrate why a contact spray is used for its control.

A model of a tent caterpillar (100x actual size) was fashioned of paper machete to show the masticating mechanism of a chewing insect. The importance of complete spray coverage was demonstrated by showing a large leaf being covered with powdered sugar so that as the insect eats the leaf the poison is taken into its stomach. Labelled packages containing stomach poisons were displayed to designate identification of spraying ingredients.

Fungus diseases were illustrated by using infected and healthy plants of perennial Phlox (Phlox panniculata). Closeup shots of the leaves of the diseased plants revealed a powdery surface. The distortion of the leaves further indicated the presence of the organism. Closeup shots of the leaves of the healthy plant showed them to be vigorous, bright colored and shiny.

A five minute moving picture film was made in the Horticultural Gardens to demonstrate two types of equipment for dusting and spraying, mixing spray materials, and how to apply the spray-dust to the plants.

"Take advantage of your setting"

For this program an entirely different technique was employed. A well-edited movie had been prepared to illustrate special types of gardens by rear projection. This movie was made by a careful selection of urban, suburban,

and rural gardens representative of the state of Michigan. It included the owners and was used to interpret their personal interest in the plantings.

These pictures were shown with a running commentary by a professor in the studio, describing the good and bad qualities of each garden. It required a 25-minute film which in preparation was edited from 90 minutes of film and emphasized most particularly the topic title.

Cost and Source Analysis.

Cost analyses have been included for all of the visual materials. These costs were estimated in terms of quotations for current prices of labor, materials, and supplies.

"Plan Your Garden First"

Materials		Source	Cost
Plywood	20 sq. feet @ 12¢	E. Lansing Lumber Co.	$ 2.40
Balsam	2 bundles @ $1.50	Lansing Hobby Shop	3.00
Screen Wire	6 sq. feet @ 5¢	Hicks Hardware, E.L.	.30
Sweeping Compound	1 can @ 49¢	Kroger Co.	.49
Slate (scrap)		E. Lans. Lumber	
Sponge	2 blocks @ 29¢	Kroger Co.	.58
Weed Materials	Collected along roadside		
Construction Paper	24 sheets @ 1¢	Campus Book Store	.24
Tools ~~loaned~~ ~~by~~	Dept. of Horticulture		20.00
Wheelbarrow ~~loaned~~ ~~by~~	Department of Horticulture		60.00
Paints and Dyes		Campus Book Store	2.00
Miscellaneous			1.00
Construction Cost	10 hours @ 85¢		8.50
Total			$98.51

"Always Prepare Your Garden"

Materials		Source	Cost
Illustration Board	2 sheets @ 30¢	Campus Book Store	$ .60
Paints	4 bottles @ 25¢	Campus Book Store	1.00
Labor on Diagram	4 hours @ 85¢		3.40
Glass Columns (2)	Dept. of Hort. @ $2.00		4.00
Flats with soil (2)	@ 50¢	Dept. of Hort.	1.00
Mulch Materials	@ 50¢	Dept. of Hort.	.50
Perennial materials (3)	@ $1.00	Dept. of Hort	3.00
Animated film (16mm)		Jam Handy, Detroit	25.00
Labels	@ 10¢		.30
Slides	5 slides @ $1.00	Extension Photo Lab	5.00
Total			$42.80

"Know Your Annual Flowers"

Materials		Source	Cost
Kodachrome slides (35mm)	15 slides @ $1.00	Ext. Photo Lab.	$15.00
Black and white prints (16" x 20")	10 prints @ $2.00	Ext. Photo Lab.	20.00
Flowering plants	5 plants @ $1.50		7.50
Total			$42.50

"Better Buy Bulbs"

Materials		Source	Cost
Kodachrome slides (35mm)			
	9 slides @ $1.00	Ext. Photo Lab.	$ 9.00
Bulbs	8 bulbs @ 25¢	Dept. of Hort.	2.00
Total			$11.00

"Use Trees and Shrubs"

Materials		Source	Cost
Illustration board (15 x 20"			
	7 pieces @ 35¢	Campus Book Store	$ 2.45
Celluloid Sheet	1 sheet @ 50¢	Campus Book Store	.50
Labor for Art Work			
	3 hours @ 85¢		2.55
Kodachrome Slides			
	7 slides @ $1.00	Ext. Photo Lab.	7.00
Total			$12.50

"Know Your Perennial Flowers"

Materials		Source	Cost
15 Kodachrome slides (35mm)	@ $1.00	Ext. Photo Lab.	$15.00
10 black and white photos			
	(16 x 20") @ $2.00	Ext. Photo Lab.	20.00
5 forced plants	@ $1.50	Hort. Dept.	7.50
Total			$42.50

"Grow 100 Roses"

Materials		Source	Cost
Garden Catalogues	2 copies @ 50¢	Wayside Garden, Mentor, Ohio.	$ 1.00
Rambler Rose Bush	1 plant @ 89¢	Kresge, E.L.	.89
Hybrid Tea Bushes	3 plants @ $2.00	Dept. of Hort.	6.00
Movie (16mm)		Ext. Photo Lab.	15.00
Floribunda'	1 plant @ $3.00	Farmington, Mich.	3.00
Total			$25.89

"Have Your Own Orchard"

Materials		Source	Cost
Kodachrome slides	4 slides @ $1.00	Ext. Photo Lab.	$ 4.00
Illustration Board	1 piece (15x20) @ 35¢	Campus Book St.	.35
Labor	3 hours @ 85¢		2.55
Barrel	1 barrel @ $2.00	Campus Salvage Dp.	2.00
Total			$ 8.90

"Don't Have Diseases and Insects"

Materials		Source	Cost
Model of sucking insect:			
Balsam wood	1 bundle @ $1.50	Lansing Hobby Shop	$ 1.50
Paint	4 cans	Campus Book St.	1.00
Labor	8 hours @ 85¢		6.80

Model of chewing insect:

Paper mache	Scrap newspaper		
Paint	4 cans	College Book Store	$ 1.00
Wire	3 ft. screen wire		
		Lansing Lumber Co.	.20
Labor	8 hours @ 85¢		6.80
Plants	2 perennial phlox		
		Dept. of Hort.	2.00
Movie (16mm)		Ext. Photo Lab.	15.00
Total			$ 34.30

"Take Advantage of Your Setting"

Materials	Source	Cost
25 minutes of black and white 16 mm. film	Photo Science Lb.	$500.00
Travel Incurred		300.00
Editing and Presentation		200.00
Total		$1,000.00

COST BREAKDOWN FOR EACH PROGRAM

"Plan Your Garden First"

Adapting Course	12.6 @ $4.00/hr.	$ 51.20
Visual Aids		98.51
Studio Costs	1 hour @ $78.45	78.45
TOTAL		$ 228.16

"Always Prepare Your Garden"

Adapting Course	12.6 @ $4.00/hr.	$ 51.20
Visual Aids		42.80
Studio Costs	1 hour @ $ 78.45	78.45
TOTAL		$ 172.45

"Know Your Annual Flowers"

Adapting Course	12.6 @ $4.00/hr.	$ 51.20
Visual Aids		42.50
Studio Costs	1 hr. @ $ 78.45	78.45
TOTAL		$ 172.15

"Better Buy Bulbs"

Adapting Course	12.6 @ $4.00/hr.	$ 51.20
Visual Aids		11.00
Studio Costs	1 hour @ $ 78.45	78.45
TOTAL		$ 140.65

"Use Trees and Shrubs"

Adapting Course	12.6 @ $4.00/hr.	$ 51.20
Visual Aids		12.50
Studio Costs	1 hour @ $ 78.45	78.45
TOTAL		$ 142.15

"Know Your Perennial Flowers"

Adapting Course	12.6 @ $4.00/hr.	$ 51.20
Visual Aids		42.50
Studio Cost	1 hr. @ $ 78.45	78.45
TOTAL		$ 172.15

"Grow 100 Roses"

Adapting Course	12.6 @ $4.00/hr.	$ 51.20
Visual Aids		25.89
Studio Cost	1 hour @ $ 78.45	78.45
TOTAL		$ 155.54

"Have Your Own Orchard"

Adapting Course	12.6 @ $4.00/hr.	$ 51.20
Visual Aids		8.90
Studio Cost	1 hr. @ $78.45/hr.	78.45
TOTAL		$ 138.55

"Don't Have Insects and Diseases"

Adapting Course	12.6 @ $4.00/hr.	$ 51.20
Visual Aids		34.30
Studio Cost	1 hour @ $ 78.45	78.45
TOTAL		$ 163.95

"Take Advantage of Your Setting"

Adapting Course	12.6 @ $4.00/hr.	$ 51.20
Visual Aids		1000.00
Studio Cost	1 hr. @ $ 78.45	78.45
Rear-view Projector	1 hr. @ $6.00/hr.	6.00
TOTAL		$1135.65

Cost of Syllabus

Printing and Make Up	1000 copies @ $.25	$ 250.00
Mailing	1000 copies @ .06	60.00
TOTAL		310.00

Total Cost for 10 Programs $2931.40

Enrollment Fees for 5 credits (1-5 credits, $15.00)

Number of Students required to consume cost - 196

Syllabus for Telecourse.

HORTICULTURE

TELECOURSE

328

Garden Flowers

THE SYLLABUS FOR THE STUDENT VIEWER

To The Student

Garden Flowers, Horticulture 328, is a study of the bulbs, annual, and perennial flowering plants, the development of the garden settings, the role of the orchard, disease and insect control, special adaptations to architectural and topographical features, and integration of garden flowers into the landscape.

The only requirement for enrollment in this telecourse is an interest in flower gardening.

By paying the registration fees, the student may enroll in this telecourse for five university credits applicable to a degree of Bachelor of Science. Awarding of full credit is dependent on the completion of the course, the assignments, and the final examination to be offered in the Department of Horticulture at the end of the course. Non-credit students may enroll and will receive the course materials, but will not receive university credit.

The textbook, "Better Homes and Garden, Garden Book", Meredith Publishing Company, Des Moines, Iowa, 1951, together with all Michigan State required publications will be mailed upon receipt of the enrollment fees. Other source books and references can be borrowed from the Michigan State College Library or purchased from a book dealer or publisher.

Each student is required to read the program outlines

and become familiar with the terminology before viewing the program. He is expected to obtain each of the articles listed under "Special Aids for Viewing" and have them in his possession at the time of viewing. Assignments are to be studied in advance of the program and "Suggested Reading" is included merely for supplementary information. The student is required to know all of the information included on the lists of perennials, annuals, and bulbs. Each list will be referred to when the assignments are made.

This telecourse is presented weekly at 10 A.M. each Saturday for a period of ten weeks over WKAR television, Channel 60 in East Lansing, Michigan.

April 3, 1954 "Plan your garden first"

The preparation of a garden plan gives the gardener an insight into the many problems of integrating the garden into a workable unit. It includes an estimate of the costs, the economy of space and expenditure, and an outline of the work which leads to the garden's completion. The plan should contain every possible incident, correct to scale and with all permanent buildings and landscape materials present. The thoroughly developed plan brings to mind many details which otherwise would be overlooked. It provides for the selection and management of soils, design for easy maintenance, and the prevention of unforseeable errors.

Terminology

Garden plan, public area, service area, play area, good

garden soil, pH, acidity, alkalinity, mulching, and winter protection.

Special Aids for Viewing

The three basic landscape areas are demonstrated from a garden model.

Features on the garden model are integrated into the garden plan.

The utilization of the areas for flowers is emphasized.

Select, maintain and store tools and equipment carefully.

Assignment

"How to Use Your Space" -- Textbook, Chapter I, pp. 1-50.

Suggested Reading

"The Plan and the Site" -- Modern Garden Craft by A. J. Cobb. Vol. I, Chapter I, Gresham Publishing Co., Ltd., London, 1938.

April 10, 1954 "Always prepare your garden"

The success of the flower garden is greatly influenced by the condition and content of the soil. Care must be practiced to keep the soil preperly drained, to maintain a high level of nutrients, and to insure good tilth. A balance of air, water, and organic matter is imperative. Manures and composts serve as an ideal source of added organic matter.

Double-trenching is a good technique for providing a deep seedbed, for incorporating air, and for adding organic matter to the soil. Seedage and plant division are the most common methods of propagating plants for the flower border.

Terminology

Tilth, subsoil, organic matter, cover crop, compost, double-trenching, seedage, and division.

Special Aids for Viewing

Notice how both the surface soil and the subsoil are illustrated in the diagram on double-trenching.

Two small containers for soil must be collected previous to the program. One container should have a high clay content soil and the other should be a high organic matter content soil.

Small, medium, and large sized seeds should be available for the program.

Assignment

"The soils in your garden" -- Textbook, Chapter 13.

Suggested Reading

The Gardener's How Book by Chesla C. Sherlock, pp. 183-186. The MacMillan Company, New York, 1935.

The Gardening Handbook by T. H. Everett, pp. 8-13. Sterling Publishing Company, New York, 1952.

April 17, 1954 "Use Trees and Shrubs"

The lawn serves to unify the garden and to provide an outdoor carpet. The success of a lawn is dependent upon the thorough preparation of a fertile seedbed, good seed, and a large supply of water. The trees and shrubs function as furniture to add accents, provide shade, and screen some areas. Selection of trees should be on the basis of utility. A good shrub must be adapted ecologically and have a long period of bloom. Regular pruning increases flowering, extends the life, and improves the shape of all trees and shrubs.

Terminology

Lawn mixture, seedbed, shrub, accent plants, screening, ecological, and pruning.

Special Aids for Viewing

Locate for reference during viewing pictures of the following trees: Sugar Maple (Acer saccharum), American Elm (Ulmus americana), White Oak (Quercus alba), Pin Oak (Quercus palustris), White Ash (Fraxinus americana), Lombardy Poplar (Populus nigra italica), and Norway Spruce (Picea abies).

Assignment

"Lawns -- how to make and keep them" -- Textbook, Chapter 2, pp. 52-72.

"Shrubs for many uses" -- Textbook, Chapter 5, pp. 154-181.

"Shade -- its problems and possibilities" -- Textbook, Chapter 9, pp. 229-248.

Forest Trees and Shrubs, Ext. Bulletin 264, Michigan State College.

Growing Beautiful Lawns, Ext. Bulletin 224, Michigan State College.

Suggested Readings

The Gardener's How Book by Chesla C. Sherlock. "Lawns", Chapter 21, pp. 201-295. The MacMillan Company, New York, 1935.

Shrubs and Vines for American Gardens by Donald Wyman. The MacMillan Company, New York, 1949.

April 24, 1954 "Know Your Perennial Flowers"

With careful selection, perennial flowers can provide the garden with a permanent planting which will furnish continuous bloom from early spring until late fall. The gardener should have a knowledge of the height, the flower color, how the plant is propagated, and any special cultural directions which may be necessary. To emphasize their versatility, attention is focused on their use in the garden. The informal border design includes three basic parts which are designated by the edge, middle, and the background of the border. Good design includes plants which are adapted to these various parts.

Terminology

Perennial flower, botanical names, division, cutting, cuttings, continuous bloom, border edge, middle of border, and background of border.

Special Aids for Viewing

Collection of pictures of those perennials which are listed.

Notes should be made on the special uses of the perennials.

Assignment

"Continuous Bloom Comes with Planning" -- Textbook, Chapter 3, pp. 73-79.

Suggested Reading

Popular Hardy Perennials by T. W. Sanders. "Perennial List" Part II. W. H. & L. Collingridge Publishing Company, London, 1928.

PERENNIAL FLOWERS

Botanical name	Common name	Flower color	Height in feet and time of flowering	
Achillea ptarmica	The Pearl or Achillea	White	2	July
Aconitum Napellus	Monkshood	Blue blue-white	4	August
Althea Rosea	Hollyhocks	White, red, yellow, purple	6	July
Alyssum saxatile	Basket of gold	Yellow	1	May
Anchusa azurea	Anchusa	Pale blue	4	May
Anemone pulsatila	Pasque flower	Lavender	1	April-May
Aquilegia canadensis	Columbine	White, yellow, red, blue	2-4	May
Arabis albida	Rock cress	White	1	April-May

Botanical name	Common name	Flower color	Height in feet and time of flowering	
Aster speciosa	Hardy aster	White, pink, lavender, red blue	1-6	Sept.
Brunnera macrophylla	Forget-me-not anchusa	Blue	2	April-May
Catananche coerulea	Catananche	Blue	2	July-Aug.
Centaurea montana purpurea	Centaurea	Purple	1-2	Aug.
Cerastium tomentosum	Snow-in-summer	White	1	May
Chrysanthemum coccineum	Pyrethrum or Painted daisy	Red, pink	2	June
Chrysanthemum hortorum	Chrysanthemum	White, cream, bronze, red	2	Sept.-Oct.
Chrysanthemum leucantha-num	Oxeye daisy	White	2½	Sept.
Convallaria majalis	Lily-of-the-valley	White	1/2	May

Botanical name	Common name	Flower color	Height in feet and time of flowering	
Delphinium hybrida	Delphinium	Lavender, blue, purple white	6	June
Dianthus barbatus	Sweet William	White, rose carmine	1-2	July-Aug.
Dicentra spectabilis	Bleeding-heart	Pink	2-3	May
Digitalis purpurea	Common Foxglove	Spotted white, rose, purple	2½-6	June-July
Gaillardia aristata	Blanket flower	Yellow, red, orange	2	June
Hemerocallis fulva	Daylily	Yellow, orange, red	2-3	June
Heuchera sanguinea	Coral Bell	Coral red	1-1½	July
Hosta plantaginea	Hosta	White, blue lavender	1-2	Aug.
Iberis sempervirens	Evergreen candytuft	White	3/4	May

Botanical name	Common name	Flower color	Height in feet and time of flowering	
Iris germanica	Iris	Various	1-2	Apr.-June
Liatris pycnostachys	Blazing Star	Pink, white	3-5	Aug.
Lycheris viscaria	German catchfly	magenta	2½	June
Mertensia virginica	Virginia Blubell	Blue, pink	2	May
Monarda didyma	Bee-balm	White, pink, scarlet	2-3	July
Myosotis sylvatica	Forget-me not	Blue, white rose	½-1	Apr.-May
Paeonia officinalis	Peony	Yellow, pink, white, maroon	2½	May-June
Papaver oriental	Oriental	Pink, red, white	3	June
Pentstemon barbatus	Beard-tongue	Scarlet	3	July

Botanical name	Common name	Flower color	Height in feet and time of flowering	
Phlox divaricata	Blue phlox	Blue, blue-purple	1	May
Phlox paniculata	Hardy phlox	White, pink, red	3-4	Aug.
Phlox subulata	Moss-pink	White, pink	½	May
Phlox suffruticosa	Carolina phlox	White, pink	3½	June
Physostegia virginiana	Physostegia or False Dragonhead	White, pink red	2-4	Sept.
Polemonium coeruleum	Jacobs ladder	Blue	2	June
Polygonatum multiflorum	Solomons-seal	White	3	May
Primula farinosa	Hardy primula	Yellow, red orange, pink, blue	½-3	May
Rudbeckia speciosa	Coneflower	Yellow, red, purple, white	3-6	July

Botanical name	Common name	Flower color	Height in feet and time of flowering
Salvia pratensis	Red salvia	Lilac, white pink	3 June
Stokesia cyanea	Stoke's aster	Blue-white	1 July
Thalictrum aquilegi-folium	Meadow rue	white to purple	3 June
Thermopsis caroliniana	Thermopsis	Yellow	5 June
Valeriana officinales	Garden Heliotrope	Pink, white, lavender	4 July
Viola odorata	Sweet violets	Violet white	1½ Apr.-May

May 1, 1954 "Know Your Annual Flowers"

Annual flowers provide the garden with a quick, inexpensive show of color. They can be selected to grow under a wide variety of conditions. Their wide range of color, varying heights, and staggered blooming period adds to their versatility. Many of the annual flowers are useful as cut flowers; they may be planted in combination with perennial flowers, bulbs, shrubs, and grassy areas.

Terminology

Annual, transplants, seedage, and Cultivar.

Special Aids for Viewing

Present a collection of pictures of the annuals as listed.

Program notations should be prepared of the special uses of the annual flowers.

Assignment

"Continuous bloom comes with planning" -- Textbook, Chapter 3, pp. 82-87.

Suggested Reading

Annuals for Garden and Greenhouse by J. S. Dakers. W. H. & L. Collingridge Ltd., Transatlantic Arts Inc., New York, 1951.

Gardening Handbook by T. H. Everett. "Annuals -- quick returns", pp. 42-45. Sterling Publishing Company, New York, 1952.

ANNUAL FLOWERS

Botanical name	Common name	Flower color	Height in feet and time of flowering	
Ageratum Houstonianum	Ageratum	Lilac, blue white, rose	½-2	Mid-June to September
Alyssum maritimum	Sweet alyssum	White, pale lilac	½	Mid-June to September
Amaranthus caudatus	Love-lies-bleeding	Dark Red	2-3	July to September
Antirrhinum majus	Snapdragon	Various	1½-2	June to September
Browallia americana	Browallia	Blue	2	July to August
Calendula officinalis	Calendula	Yellow and orange	1½	July to frost
Callistephus chinensis	China Aster	Various	2-3	July and August
Celosia argentea	Celosia	Maroon and Gold	2	July and August
Centaurea Cyanus	Cornflower	Various	½-3/4	July to August

Botanical name	Common name	Flower color	Height in feet and time of flowering	
Centaurea moschata	Sweet Sultan	Pink and rose	½	Late July August
Chrysanthemum carinatum	Chrysanthemum	Various	1-1½	July to August
Chrysanthemum parthenium	Feverfew	Yellow	1-3	July to August
Clarkia elegans	Clarkia	Purple and rose	1-6	August to frost
Cleome spinosa	Cleome	Red	3-4	July to August
Coreopsis tinctoria	Calliopsis	Yellow, red and orange	1-3	Late June to Sept.
Cosmos bipinnatus	Cosmos	Crimson, pink and white	4-6	August to frost
Delphinium ajacis	Larkspur	Various	1-3	Mid-July to Sept.
Dianthus caryophyllus	Carnation	Red, white pink, and yellow	1-2	June-Aug.

Botanical name	Common name	Flower color	Height in feet and time of flowering	
Dimorphotheca aurantiaca	Dimorphotheca	Yellow, orange and white	1-2	July to September
Eschscholtzia californica	California poppy	Cream, red orange and yellow	½-1	July to August
Gypsophila elegans	Babysbreath	White and pale pink	1-2	Late July to August
Helianthus annuus	Sunflower	Yellow	3-7	July to frost
Halichrysum bracteatum	Straw Flower	White, pink orange and red	2-3	July to August
Iberis amara	Candytuft	Various	½-1	Late June to mid-July
Ipomoea purpurea	Common Morning glory	Purple, blue white and red	Vine	July to August
Lantana hybrida	Lantana	Purple, red and pink	1-2	July to August
Lathyrus odorata	Sweet Pea	Various	6	July to August
Limonium sinuata	Statice	Various	1-2	July to August

Botanical name	Common name	Flower color	Height in feet and time of flowering	
Linaria maroccana	Linaria or toadflax	White, yellow red, pink or blue	1-2	July to August
Lobelia Erinus	Lobelia	White, pink lavender and blue	½-2	Mid-May to frost
Mathiola incana	Stock	Various	1-2	Late July to Sept.
Mirabilis jalapa	Four O'clock	Various	2-3	July to September
Nicotiana alata	Nicotiana	White and red	2-4	July to frost
Nigella damascena	Love-in-a-mist	Blue, white and lavender	½-1	July to August
Papaver somniferum	Opium poppy	Various	2-3	July to August
Petunia hybrida	Petunia	Various	½-1	Late June to frost
Portulaca grandiflora	Portulaca	Various	½-1	Late June to Sept.

Botanical name	Common name	Flower color	Height in feet and time of flowering	
Phlox drummondii	Phlox	Various	½-1	Late June to late September
Reseda odorata	Mignonette	Cream	½-1	Late June to mid-August
Salpiglossis sinuata	Salpiglossis	Various	2-3	July and August
Salvia splendens	Salvia	White and red, lavender and pink	2-4	Late June to frost
Sanvitalia procumbens	Common sanvitalia	Yellow	1	July to August
Scabiosa atropurpurea	Scabiosa	White, red and pink	2-3	Late July to frost
Tagetes erecta	African marigold	Yellow and orange	2-4	Mid-June to Aug.
Tagetes patula	French marigold	Yellow, orange and brown	1-2	Late July to August
Torenia fournieri	Torenia	White and lavender	1	Late June to August

Botanical name	Common name	Flower folor	Height in feet and time of flowering	
Tropaeolum majus	Nasturtium	Cream, yellow and orange	1	Late June to frost
Verbena hybrida	Verbena	White, red, pink and blue	1	Early August to frost
Zinnia elegans	Zinnia	Various	1-3	July to frost

May 8, 1954 "Grow 100 Roses"

Roses are available in a wide variety of types and color. Some rose plant may be chosen to suit almost any location or purpose. Because of this versatility, a thorough understanding of their culture is imperative. Careful selection and preparation of the soil is essential before planting; pruning must be adapted to the season, purpose, and the type of bush; diseases and insects can be a menace; and disbudding produces larger flowers on hybrid tea roses. Winter protection is necessary for tender varieties grown in northern parts of the United States.

Terminology

Hybrid Tea, floribunda, polyantha, rambler, dormancy, heeling-in, disbudding, and winter protection.

Special Aids for Viewing

Read Chapter 4 in the textbook for a better understanding of the uses of roses. Select a picture of a hybrid tea, floribunda, and a rambler from a nursery catalogue to be used as a reference during the demonstration of the various types of roses.

Assignment

"Success with Roses" -- Textbook, Chapter 4, pp. 131-152.

Suggested Reading

Better Roses by A. S. Thomas. Angus and Robertson Pub., London, 1950.

Pageant of the Rose by Jean Gordon. Thomas and Crowell Publ., New York, 1953.

May 15, 1954 "Have Your Own Orchard"

Fruit trees furnish shade and ornamental value both of which merit consideration when planning the garden. Careful selection of varieties and kinds of fruits will result in a supply of fresh fruit for the whole year. Dwarf trees can be used when space is limited; espalier fruit trees are especially artistic and conserve space. A few basic principles of fruit growing should be understood before planting a small home orchard. Adequate control of insects and diseases must be practiced to insure a crop as well as prevent contamination of the neighborhood.

Terminology

Compatability, espalier, dwarf tree, East Malling rootstock, pruning, and pollination.

Special Aids for Viewing

An illustrated fruit tree catalogue including varieties of apple, pear, peach, sweet and tart cherries, plum, and apricot will be helpful during the discussion of the varieties of fruit.

Assignment

"Fruit for the home place" -- Textbook, Chapter 15, pp. 365-374.

Dwarf Fruit Trees. Folder 136. Michigan State College.

The Home Fruit Garden. Folder 149. Michigan State College.

Suggested Reading

Simple Fruit Growing by P. K. Bear. W. H. & L. Collingridge Ltd., London, 1947.

Fruits for the Home Garden by U. P. Hedrick, Chapter V. Oxford University Press, New York, 1944.

May 22, 1954 "Better Buy Bulbs"

Bulbs provide the spring garden with many colorful flowers. The many types furnish a sequence of blooms from early April until after frost in the fall. Careful selection and planning with bulbs allows versatility of use with other bulbs, annuals, and perennials. A good deep, well-drained and well fertilized soil is essential for growing large flowers. An understanding of the various bulbs and bulb-like structures is essential for their propagation.

Terminology

Bulb, corm, bulbel, bulblet, root, tuber, rhizome, and rejuvenation.

Special Aids for Viewing

A collection of pictures of the flowering bulbs listed

will be useful. An actual tulip bulb, gladiolus corm, and a dahlia root in your hand during the demonstration of bulb-like structures will clarify and make the explanation more vivid.

Assignment

"Dahlia" -- Textbook, pp. 111.

"Summer Flowering Bulbs" -- Textbook, pp. 114-119 and 125-128.

"Spring Flowering Bulbs" -- Textbook, pp. 121-124.

"How to Handle Tulips" -- Textbook, pp. 128.

Suggested Reading

Garden Bulbs in Color by J. Horace McFarland, L. H. D., R. Marion Hatton, and Daniel J. Foley. The MacMillan Co., New York, 1948.

The American Gardner's Book of Bulbs by T. H. Everett. Random House, 1954.

FLOWERING BULBS

Botanical name	Common name	Flower color	Depth of Planting and time of flowering	
Canna iridiflora	Canna	Various	4-6"	July-Aug.
Chionodoxa luciliae	Chionodoxa or glory-of-the-snow	Blue with white center	3"	March-May
Colchicum autumnale	Colchicum Autumn Crocus	Purple and white	3"	Aug.-Sept.
Crocus imperati	Crocus	White, lilac and purple	2"	March-April
Dalhia pinnata	Dahlia	Various	4-6"	August-Sept.
Erythronium hartwegii	Dog's Tooth Violet	Yellow and orange	3"	April-May
Freesia Hybrida	Freesia	Various	4"	June
Fritillaria meleagris	Fritillaria	White, yellow and orange	4"	April

Botanical name	Common name	Flower color	Depth of Planting and time of flowering	
Galanthus nivales	Galanthus snowdrop	White	2"	March-April
G diolus speciosa	Gladiolus	Various	3-6"	July-Sept.
Hyacinthus orientales	Hyacinth	Various	6"	April-May
Iris hybridum	Dutch Iris	Violet and purple	4"	May
Ixia viridiflora	Ixia	Pale green	4"	May-June
Kniphofia uvaria	Tritoma or red hot poker	Red, gold orange	4"	July-Sept.
Lachenalia pendula superba	Lachenalia or Cape Cowslip	Yellow	5"	May
Leucojum verum	Leucojum or Snowflakes	White	3"	April
Lilium Speciosa	Lilies	Various	8"	June-Sept.

Botanical name	Common name	Flower color	Depth of Planting and time of flowering	
Muscari armeniacum	Muscari or Grape Hyacinth	White, blue, or flesh pink	3"	April-May
Narcissus Psuedo-Narcissus	Common daffodils	White, yellow and cream	7"	April-May
Narcissus Jonquilla	Jonquil	Yellow	4"	April-May
Narcissus poeticus	Poet Narcissus	White and yellow	7"	April-May
Ornithogalum umbellatum	Ornithogalum or Star of Bethlehem	White with green margin	4"	May-June
Oxalis Bowiei	Oxalis	Pink	2-3"	June-July
Polygonatum biflorum	Polygonatum or Solomon's Seal	White	2"	April-July
Ranunculus asiaticus	Ranunculus or Persian Buttercup	Various	3"	July-Sept.
Scilla atrocoerulea	Scilla or Squil	Blue, white and reddish	3"	March-May

Botanical name	Common name	Flower color	Depth of Planting and time of flowering	
Sternbergia lutea	Sternbergia or Fall Daffodil	Yellow	6"	Sept-Oct.
Trillium grandiflorum	Trillium	White	3"	April-May
Tulipa Gesneriana	Tulip	Various	5"	May-June

May 29, 1954 "Don't Have Insects and Diseases"

Cleanliness and immaculate maintenance are the first essentials for the prevention of insects and diseases. The accumulation of weeds, leaves, trash, and other debris provides a breeding place for garden pests. The common diseases and insects injuries must be identified in order to provide the most effective control. For simplicity, insects may be divided into two classes, sucking and chewing. Diseases are grouped according to fungi, bacteria, and virus. An "all-purpose dust or spray will give good control. Proper equipment and thorough coverage of all parts of the plant are essential. Direction for application of a dust or spray material should be followed exactly as recommended by the manufacturer.

Terminology

Sucking insect, chewing insect, fungi, bacteria, virus, spreader, spray schedule, insecticide, fungicide, and herbicide.

Special Aids for Viewing

Open textbook to Chapter 16, pp. 375-394.

A package of an "all-purpose" garden dust will be useful during the discussion of insecticides and fungicides.

Assignment

"Control of Garden Pests and Diseases" -- Textbook, Chapter 16, pp. 375-394.

Pest Control Program for Home Orchard and Small Fruit. Extension Folder 17, Michigan State College.

Suggested Reading

How to Combat Insects by T. H. Everett. The Gardening Handbook, pp. 112-115. Sterling Publishing Company, Inc., New York, 1952.

June 6, 1954 "Take Advantage of Your Setting"

Many gardens have limited space, adverse growing conditions, undulating topography, or have other problems which are difficult for the gardener to handle. The wide variety of plants and their versatility of uses, offer a challenging solution to most every garden problem. The development of special areas, utilization of inherent qualities, accentuation of good features, inclusion of indiginous plants are economical and satisfying solutions. Severe architecture lends itself to the use of more flowering plants. Special consideration should be given to flowers to be used in the following: alpine, rock, cactus, beach, water, bog, patio, and architectural garden.

Terminology

Alpine garden, rock garden, cactus garden, beach garden, water garden, bog garden, patio garden, architectural garden, xerophyte, and hydrophyte.

Special Aids for Viewing

A collection of pictures selected from current garden magazines to help the viewer to understand each type of special garden.

Assignment

"Window Gardening and Success with Plants" -- Textbook, Chapter 17, pp. 395, 404-406, 416 and 419.

Suggested Reading

The Rock Garden and Alpine Plants, by C. A. R. Phillips, W. H. & L. Collingridge, Ltd., London, 1946.

Water Gardening by Francis Perry. Charles Scribner's Sons, New York, 1938.

Miniature Gardens by Anne Ashberry. D. Van Nostrand Co., Inc., New York, 1952.

TESTING QUANTITATIVE USE OF TERMINOLOGY

Testing Program. Since it was difficult to know how much subject matter could be assimilated in each for the ten telecasts presenting Horticulture 328, a testing program was designed to measure the effectiveness of the use of three definite quantities of scientific concepts. It was also of interest to attempt to determine the value of the use of a system of superimposition to fortify the comprehension of each of these concepts.

Consequently, one television program was selected from the series as a sample to measure the quantity of scientific terms which could be assimilated in one broadcast. Individual slides of the scientific terms were prepared and were superimposed for 15 seconds on the screen at designated times during the testing program. The program was produced and recorded by the kinescope method.

For the test audiences, matched groups of first-term freshmen were selected from the Communications Skills division of the Basic College at Michigan State College (TABLE II). The groups were randomized and assigned to their respective cells in the statistical design.

The program was divided into three segments: one contained 15 terms, one contained 20 terms, and another contained 25 terms. Six different groups of viewers were exposed to each of the three segments, both with, and with-

TABLE II

TESTING SCHEDULE

Time	Instructor	Number of Students	Program
23 June 1954			
09.00 - 10.00 hrs.	Mr. W. G. Butt	21	15 terms
10.00 - 11.00 hrs.	Miss N. Landmark	24	15 terms with labels
11.00 - 12.00 hrs.	Mr. W. G. Butt	18	20 terms
15.00 - 16.00 hrs.	Miss N. Landmark	24	20 terms with labels
16.00 - 17.00 hrs.	Mr. T. B. Strandness	18	25 terms with labels
24 June 1954			
13.00 - 14.00 hrs.	Mr. D. F. Sheehan	18	25 terms

Students were enrolled in Basic College Course III, Communications Skills at Michigan State College.

out the addition of the superimposed terms. A "recall" test of the terms was made immediately after viewing the recording. Three minutes were allowed for the two groups receiving 15 terms, four minutes for the groups viewing 20 terms, and 5 minutes for the groups viewing all three of the segments. Before testing each group, uniform instructions were provided.

A "Comprehensive" test in which the students were asked to select the term which best fitted the explanation or definition was conducted immediately following the "recall" test. The two groups which received the 15, 20, and 25 term segments were provided 9, 13, 17 minutes, respectively, to complete the examination.

The testing program was conducted in a darkened classroom using a 16 mm moving picture projector*, with sound to show the kinescopic recording and a Kodo Slide Projector, Master Model Series 1, for the simultaneous showing of the black and white slides of the scientific terminology. The investigator and the professional movie projector operator rehearsed the synchronizing of the slides with film before the testing program was begun. The slides were projected onto the lower edge of the picture frame to give the effect of a studio superimposition. Prior to each exposure, each cell of students was motivated to cooperate by explaining

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*Bell and Howell movie projector, Model 185.

the nature of the research problem, by indicating that to cooperate was a favor to the investigator and that each student's paper would remain incognito. Each student was presented with one flower.

Statistical Design. The statistical design of the problem was a between-row, between-column pattern which facilitated the use of analysis of variance for the evaluation of the results. The tests questions and word lists were randomized to eleviate sample errors.

For the anlysis of variance, all cells were equalized to 17 students using a randomized selection from the tables of randomized numbers.

INTERPRETATION OF RESULTS

Development of Course. The telecourse which has been developed was the result of planned analysis of the content and techniques used to present Horticulture 328 in the classroom. From the lecture and laboratory outlines (see Adaptation of Course), and notes provided by the lecturer, the course content was evaluated and the information reassembled into ten programs suggested for television presentation. All subject material not related directly to the topic, any repetition of material, or any item which required previous study in related fields of science were eliminated to help facilitate organization into the 28 minutes of television time.

The lectures were rearranged to present the material in progressive steps so that, for example, the student would understand the problems of culture before the identification of annuals was presented.

Scheduled presentations did not allow as much flexibility for timing the topics to suit the season as did the lecture and laboratory classroom system of presentation.

The recommendations of Speece, Skelsey, and Gapen (1953) were adopted to make use of visual aids merely to interest the student and clarify the subject matter. The amount of time devoted to one item on a program was weighed against the contribution of that item to the overall subject matter in order to make the best use of the limited

time available.

The formats were organized to serve as a master plan from which the instructor might develop the continuity of the program and present pre-planning directions for the construction or acquisition of sets, for clearance of music which was held under broadcast regulations, and for all props, including living plants which had to be forced into flower at the time of the broadcast.

In consideration of the necessity for precise timing of the television production, the format was developed well in advance of the production to allow an opportunity to schedule the subject material in the 28-minute program, yet allow ample time for thorough explanations and complete coverage of the subject material. The sequence of subject material in the formats helped the director to anticipate the action and plan the positions for the cameras.

Although Hard and Watson (1953) reported that the dramatic type of presentation was of greater interest to an audience than a lecture or a lecture-demonstration type of format, all three types were of equal value for communicating horticultural information. Considering these data, the extra costs of dramatic talent, time required for rehearsals and production of dramatic scripts, the lecture demonstration type of format was adopted for the ten presentations. This method also afforded good control of the subject material. There has been disagreement about the

value of the dramatic type of presentation. Rock, Duva, and Murray (not dated, SDC Report 476-02-3), have indicated that a dramatic type of presentation had only one-half the educational value of one of narration. These results appear to be conflicting, but they were obtained for a specific audience of male military reservists, in contrast to the collection of general audiences of varied age, sex, and interest used by Hard and Watson (1953). Different topics were used for testing in each of the two investigations. No adequate system of presenting a simulated trip outside of the studio was possible in a dramatic sequence, yet this was accomplished by the use of rear view projection, a feature which was effective as part of a lecture-demonstration format.

It would be difficult to reduce the 12.6 hours for program required for preparation and presentation or reduce the average cost of $293.14 per program without impairing the quality of the production of this telecourse.

In an attempt to utilize the recommendations of Tonkins and Skelsey (1953), a broad scope of visual aids has been suggested in order to demonstrate their adaptability to the unlimited variety of topics afforded by horticulture. Since New (not dated) found the use of devices merely to capture attention to be of no value in a quantitative measure of learning, superfluous visual aids were avoided.

Using samples of a telecourse syllabus from the Univer-

sity of Toledo (Southworth and Stahl, 1953), Western Reserve University (Stromberg et al, 1951), University of Michigan (Taylor, 1953-1954), and Butler University (Graham, 1954), the syllabus for Horticulture 328 was prepared to serve as an explanatory plan and provide an opportunity for the student to read the assignments in advance. Special aids for the student were included in the syllabus to allow active participation during the program and provide learning by kinesthetic reaction as well as by sight and sound. Special terms which might be difficult to understand were listed separately so that the student might anticipate their explanation. Extra references were provided for students who might be interested in particular topics.

Testing Quantitative Use of Terminology. Increasing the number of terms used on a program from 15 terms in 15 minutes, to 20 terms in 19 minutes, to 25 terms in 24 minutes did not alter significantly the percentage of terms comprehended or recalled, when tests were made immediately following the exposure of a kinescopic recording of one program teaching horticulture to a randomized group of students (5 percent level) (Tables III and IV).

These data showed an increase in the number of terms recalled by two of the groups which were exposed to the superimposed terms. The group receiving 15 terms scored an average of 27.2, and the groups receiving 20 terms, 38.8, a difference of 11.6 percent (significant at the 1% level).

TABLE III

MEASURE OF "RECALL" IN PERCENT

	Programs including		
	15 terms	20 terms	25 terms
No labels	42.2	27.3	43.3
Labels	27.2	38.8	50.1

TABLE IV

MEASURE OF "COMPREHENSION" IN PERCENT

	Programs including		
	15 terms	20 terms	25 terms
No labels	54.8	50.0	54.1
Labels	64.6	57.6	51.1

Not significant at the 5% level

The increase in number of terms recalled by groups receiving 25 terms was 11.3 percent more than those receiving 20 terms, but it was not significant at the 5% level (Table III).

There was no significant change in the level of recall in the "no label" groups. The level of recall between the "15 term" and "25 term" groups was nearly equal. Between the "15 term" and "20 term" groups using no labels, there was a decrease in recall, but it was not significant at the 5% level (Table III). In general, the use of superimposed terms was not worthwhile.

The increase in number of terms recalled at the 25 term level may have been a result of the increase in the number of terms used because Vincent, Ash, and Greenhill (no date, SDC Report-269-7-7), have suggested that as more information is presented, interferences are set up which result in less efficient learning of a single item. With the use of labels the overall number of items recalled was higher as a result of using more terms.

The increase in recall of terms only beneficial at the 20 term level would not justify the general use of superimposed labels for hoticultural teaching. When consideration was given to the extra cost, the inconvenience of use, and the extra time for preparation, it was unlikely that the use of superimposed labels would be worthwhile.

The importance of vocabulary has been emphasized by

Conrad (1931). He stated that transfer of knowledge could be measured by the individual ability to define words correctly. Learning through television has been shown to be more meaningful when familiar words were chosen or when there was an explanation of all unfamiliar and technical terminology (Smith and van Ormer, not dated).

This concept might indicate that the use of superimposed labels might be beneficial for botanical names, cultivars, and some names of important plant processes, since these terms are generally more difficult to remember and there was an indication that the superimposed labels were an added advantage when 20 terms were exposed to the group.

Superimposition of terms did not increase the comprehension under the conditions of the investigation (TABLE IV).

There was no significant change in comprehension as a result of the use of superimposed labels (5% level). There was a measureable decrease in the quantity of comprehension as the number of terms was increased from 15 to 20 to 25 providing labels were superimposed on the picture (Table IV).

This has been confirmed by New (no date) who maintained that devices specifically designed for emphasizing subject matter in moving picture films were of no value as a quantitative measure of learning. It does not mean, however, that the group provided with the highest number of

terms did not learn more than either of the other groups. Without the use of labels all groups comprehended approximately the same percentage but this was in direct proportion to the number of terms to which they were exposed.

As a matter of interest, several students who were part of the testing group commented that the use of labels was a source of distraction.

Although there was evidence that the use of 20 terms in combination with the superimpositions was superior to the use of 15 or 25 terms in the quantity of items recalled, further research would be necessary to ascertain the number of terms, without labels, which would be optimum for a 30-minute telecast teaching horticulture.

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AN ADAPTATION OF A COURSE FOR TELEVISION TEACHING OF HORTICULTURE

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AN ABSTRACT

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ABSTRACT

Professional horticulturists have an opportunity and a responsibility through the medium of television to educate producers and consumers in the utilization of fruits, flowers, vegetables, and ornamental plants.

In the past, educational television has drawn upon related areas, such as radio, theater, motion picture industry, audio-visual education, and commercial television, for its techniques and talent which has resulted in a quantity of writing which was chiefly interpretation. Most of the research in television has been provided by the United States Department of Defense and the United States Department of Agriculture.

As soon as several ultra high frequency stations were designated for education, there was more opportunity for research in educational television. The present project was designed therefore, to adapt a lecture-laboratory course in Horticulture to an effective telecourse; to make a quantitative study of the use of scientific terminology in television teaching.

After making an appraisal of the course content and surveying the technique of presentation in the classroom and laboratory, the subject material and lecture topics were regrouped under the following ten popularized program titles; Plan Your Garden First, Always Prepare Your Garden, Know

Your Annual Flowers, Better Buy Bulbs, Use Trees and Shrubs, Know Your Perennial Flowers, Grow 100 Roses, Have Your Own Orchard, Don't Have Insects and Diseases, and Take Advantage of Your Setting.

Formats, including descriptions for the sets, audio-video instructions, and the items to be presented were prepared for each program.

Visual aids were selected for the purpose of clarifying the subject matter and to demonstrate the various types of visual aids adaptable to horticultural topics.

The average total cost for each program including time for adaptation, visual aids, and the use of the studio, was $293.14. The production of one program as a basis for calculation showed that 12.6 man-hours were required for the preparation and presentation.

A syllabus was provided to serve as a study guide, as a record of assignments and to furnish special information for the programs on annuals, perennials, and bulbs.

Each of three matched groups of students was exposed to a program containing 15, 20, or 25 specialized horticultural terms without the addition of superimposed labels of these terms which were projected for testing purposes. Each of three identical groups was exposed to the same program with the addition of superimposed terminology. Results of the tests which were designed and provided for the test groups showed that there was no alteration in the percentage

of terms comprehended or recalled as a result of increasing the number of terms from 15 to 20 to 25. The number of terms comprehended was in direct proportion to the number supplied and therefore more information was comprehended equally as well from an increase in the number of terms used.

The use of superimposed terms improved the ability to recall the terms only when 20 terms were used. It was recommended therefore that the use of superimposed terms was of limited value.

Further research would be required to determine the optimum number of scientific terms for a 30-minute telecast teaching horticulture.