whatever is given on the package and if we want 25% captan in the final mix, we start out with 50%.

DICK STADTHERR: What size trees are you using? Are these big trees or small trees from which you are propagating?

HOY GRIGSBY: I have tried all ages. We have not had good results in any of these as you have seen here, but the older trees do root more poorly as you would expect and in working out these techniques we're working with six year old trees.

HANS HESS: The next subject this morning is on the effects of medium, pH, and root inducing chemicals upon the rooting of *Gardenia jasminoides*. It will be given by Dr. Booker T. Whatley.

THE EFFECTS OF MEDIA, pH, AND ROOT INDUCING CHEMICALS ON ROOTING OF GARDENIA JASMINOIDES

BOOKER T. WHATLEY, MCKINLEY MAYES & JACK H. JEFFERSON
Southern University
Baton Rouge, Louisiana

A limited amount of published information on the propagation of *Gardenia jasminoides* is available. Southern growers propagate gardenia cuttings in open nursery or in cold frames. The cuttings. six or seven inches long, are made in late winter or early spring. The cuttings are stuck in sandy soil which covers two-thirds their length (1, 5).

Watkins (5) in Florida has reported that high humidity,, constant temperature and moisture are necessary for speedy rooting. The media used have been clean, sharp builder's sand, peat or sphagnum moss. Gardenias being susceptible to root-knot and other diseases, sterilized or fresh media are required. Root inducing chemicals are not essential, but larger root systems are formed in shorter periods on cuttings that have been dusted with one of the root-inducing agents.

Hartmann and Kester (2) reported that leafy terminal cuttings may be rooted in the greenhouse under glass from fall to spring. A mixture of one-half sand and one-half peat moss was a good rooting medium. These authors further stated that gardenias were difficult to transplant and should be moved only when small.

Laurie *et al* (4), in Ohio, reported that tip cuttings four to six inches long taken between December and March and treated with a growth substance hastens rooting, which may be expected in four to six weeks.

Materials and Methods

A 2 x 3 x 5 factorial experimental design with three replications and ten cuttings plots was employed to study the effects of media pH and root-inducing chemicals on rooting of *Gardenia jasminoides* cuttings during a 45-day period.

[1]The authors express their appreciation to Dr Barton R Farthing, Professor and Head, Department of Experimental Statistics, Louisiana State University, for his advice and assistance regarding the statistical analysis

The root-inducing chemicals used were 3-indoleacetic acid and 3-indolebutyric acid at levels of 0, 25 and 50 ppm respectively in talc. The root-inducing mixtures were prepared according to the method described by Jefferson (3).

Three of the media used were vermiculite, perlite and the Southern University potting mix. The following is a description of the Southern University potting mix;

Ingredients by Volume

1 Part Top Soil
1 Part Course Sand
1 Part Peat Moss (Acid)
2 Parts Sawdust (Old)

Additives Per Cubic Yard

3 Pounds Superphosphate
10 Pounds Dolomite Lime
pH 6.4
Steam treatment for 45 minutes at 180° F.

Two additional media were prepared by adding two and four pounds of aluminum sulfate per cubic yard of media respectively to the Southern University potting mix.

The pH of the media under investigation were vermiculite, 6.0; perlite, 7.2; Southern University potting mix, 6.4; Southern University potting mix with two pounds of aluminum sulfate added, 5.1; and Southern University potting mix with four pounds of aluminum sulfate added, 4.3.

The cuttings used were terminal soft wood and three nodes in length (3½ to 4 inches) from three-year-old stock plants. All leaves were removed from the second and third nodes. The cuttings were approximately five mm in diameter at the base. The rooting mixture was applied and the cuttings stuck in 2¼ inch round jiffy pots containing the respective media. The potted cuttings were placed on the propagation bench and watered in. The cuttings were then propagated under mist with bottom heat.

The data were obtained by counting the number of roots that penetrated the peat pot in 45 days. (October 13 to November 26, 1965).

Results and Discussion

The mean number of roots that penetrated the jiffy pots in 45 days for the respective media were vermiculite, 14.0; perlite, 1.4; Southern University potting mix, 5.6; Southern University potting mix with two pounds of aluminum sulfate added, 7.4; and Southern University potting mix with four pounds of aluminum sulfate added, 5.9. Highly significant differences were found between the media used (Table 1).

No significant differences were found between 3-indoleacetic acid and 3-indolebutyric acid regardless of the level used. No significant interactions were found between any of the factors under investigation.

TABLE 1. ANALYSIS OF VARIANCE

Source of Variation	d./f.	S.Sq.	M.Sq.	F
Replication	2	206		
Media (A)	4	14,965	3,741.3	27.35**
Acid (B)	1	36	36.0	.26
Levels (C)	2	50	25.0	.18
Media X Acid (AB)	4	752	188.0	1.37
Media X Level (AC)	8	549	68.6	.50
Acid X Level (BC)	2	615	307.5	2.25
Media X Acid X level (ABC)	8	330	41.3	.30
Experimental Error	58	7,936	136.8	
Sampling Error	810	45,983	56.8	
Total	899	71,422		

Summary

A 2 x 3 x 5 factorial experiment with three replications were employed to study the effects of media, root-inducing chemicals and three levels of these chemicals on rooting of *Gardnia jasminoides* terminal cuttings. Vermiculite was found to be significantly better than the other media tested. Perlite was by far the least desirable of the media. 3-Indoleacetic acid and 3-indolebutyric acid at 25 and 50 ppm were no better than the control. The essentiality of root-inducing chemicals at the levels used was not shown.

The data seem to indicated that rooting media for this species should be from medium to slightly acid.

LITERATURE CITED

1. Anonymous. 1957. Gardenia Culture. U.S. Department of Agriculture Leaflet No. 199. Washington, D.C.
2. Hartmann, H. T. and D. E. Kester. 1959. Plant Propagation Principles and Practices. Prentice-Hall, Inc., Englewood Cliffs, N.J.
3. Jefferson, J. H. 1965. Preparation of Rooting Compound. Unpublished.
4. Laurie, A., D. C. Kiplinger, and K. S. Nelson. 1958. Commercial Flower Forcing. McGraw-Hill Book Company, Inc. N.Y.
5. Watkins, J. V. 1950. Gardenias in Florida. Agricultural Extension Service. Gainesville, Florida.

HARRISON FLINT: What temperature do you try to maintain in the rooting medium?

DR. WHATLEY: The thermostat was set at 68° F. plus or minus 2 degrees.

DICK FILLMORE: I'm not clear on the volume of vermiculite which was added to the basic mix or whether or not it was used in pure form.

DR. WHATLEY: Vermiculite and perlite were used in the pure form.

JIM WELLS: Any misting system?

DR. WHATLEY: Yes, we had it under intermittent mist. One minute every fifteen minutes during daylight, from about 7:30 a.m. to about 4:30 in the afternoon.

HANS HESS: Our next topic this afternoon is by Sid Waxman on the propagation of blueberry cuttings under various light intensities.

PROPAGATION OF BLUEBERRIES UNDER FLOURESCENT LIGHT AT VARIOUS INTENSITIES

SIDNEY WAXMAN
Plant Science Department
University of Connecticut
Storrs, Connecticut

Introduction

The trend in propagation as well as in the growing of plants has been toward a more controlled environment. For example; shading, bottom heat, mist and the plastic tent, all are forms of environmental control. By rooting cuttings under controlled conditions more consistently uniform results may be anticipated.

Although the use of such expensive controls as growth chambers, in which light, temperature and humidity are closely regulated, is not economical; structures can be used in which these environmental factors are more easily and perhaps less expensively controlled.

For example, a roof-covered pit house, built 7 - 10 feet into the soil and insulated, may be the most ideal unit for the rooting of cuttings. The buffering effect of the soil surrounding this unit could prevent temperatures from getting too high in the summer and too low in the winter. With such temperature control the relative humidity would not vary appreciably. Sudden losses of water vapor from the leaves on a partly cloudy day could be avoided in this type of structure because the light source is always under control and at a uniform intensity.

The deciding factor as to whether the use of such a structure is economical lies in the light energy input required, i.e., in the cost of lighting. There is no need to provide a light intensity equal to that of the sun. Although the sun may provide up to 12,000 footcandles of light, most so-called "sun-loving" species can grow normally with a maximum of 2,000 footcandles. "Shade-loving" plants, are able to grow at intensities as low as from 200 to 500 footcandles.

An experiment was made to observe the response in rooting of a shade-loving plant (blueberry) to various intensites of light in a plastic tent and under a mist system. Specifically, the object of the experiment was to determine the minimal range of light intensity under which root initiation and development may occur.