PLASTIC STRUCTURES FOR ACCELERATED PLANT GROWTH

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The use by the nursery industry of plastic covered storage houses for overwintering both container-grown and fall-harvested field-grown evergreens has become a standard practice in Ohio and ın much of the northern United States. In recent years, some nurserymen have explored the aspect of utilizing basically the same structures with the addition of heat to grow certain nursery crops during late winter and spring.

At The Ohio State University a preliminary study was initiated to produce salable 1 gallon container grown plants in the shortest possible time in heated plastic covered structures.

MATERIALS AND METHODS

Cuttings rooted during the summer and fall of 1971 were potted ınto 1 gallon containers and stored in an unheated, unventilated plastic covered house. The storage house was covered with one layer of 4 mil. mılky or white plastic. A select number of control plants of each species remained in this house throughout the study to sımulate conventional winter storage.

On February 1, 1972, a majority of each of the plant species were placed in a 96' x 12' quonset -shaped, double layer, plastic-covered structure heated to 40° F. The outside layer was 4 mıl. thickness, milky plastic, and the inside layer was 4 mil. clear with the films separated by forced air provided by a shaded-pole blower.

The heat was supplied by a natural gas-fired Reznor unit Model No. XB 150 with a 150,000 BTU rating. Every 7 days the temperature was increased 5° F until 70° F was reached in late March. The 70° F temperature was maintained until June 1, 1972.

Thıs structure was equipped with a fan and shutter system to ventilate when the temperature reached 80° F. The heated and cooled air were transmitted through an 18" diameter perforated poly tube attached to the heating unit at one end of the house and to the shutter at the far end. The shutter was closed at all times except when the exhaust fan operated and brought outside air in through the shutter and poly tube.

RESULTS AND DISCUSSION

Most plants responded to the supplemental heat as indicated by the additional growth expressed in Table 1.

The greatest growth response to supplementary heat was noted with *Abelia, Ajuga, Euonymus, Hedera,* and *Pyracantha.* The two *Cotoneaster* species and *Pachysandra* responded to the addition of heat but not as markedly as the other species.

Table 1. Growth of rooted cuttings of landscape plants overwintered in two plastic covered structures. The figures represent the average dry weight of tops of 5 plants harvested June 20, 1972 ath the soil line.

Plant	Grams Dry Weight		Per cent increase
	Unheated	Heated	
Abelia x grandiflora	6	24	300
Ajuga reptans	3	12	300
Contoneaster apiculata	6	11	83
Cotoneaster divaricata	19	36	95
Euonymus kiautschovicus	5	25	400
Hedera helix	4	17	313
Pachysandra terminalis	4	8	60
Pyracantha coccinea 'Lalandii'	4	20	400

Table 2. Growth of rooted cuttings ove-wintered in two plastic covered structures and grown outdoors for one full season. The figures represent the average height or diameter of 5 plants measured on September 22, 1972.

Plant	Growth in Inches		Grade increase
	Unheated	Heated	
Abelia x grandiflora (D) *	26	36	Yes
Ajuga reptans (D)	14	16	Yes, June
Hedera helix (D)	25	37	Yes, June
Ligustrum obtusifolium var. *regelianum*	13	21	Yes
Pachysandra terminalis	6	8	Yes, June
Pyracantha coccinea 'Lalandii'	10	14	Yes
Viburnum rhytidophyllum	6	13	No

* (D) Diameter measurement, all others expressed in height

To determine whether an additional grade or size could be achieved with the supplemental heat, select plants were measured in September 1972 and these differences are expressed in Table 2.

The three ground covers *Ajuga*, *Hedera*, and *Pachsandra* in the heated structure were salable 1 gallon plants by June while most other heated plants had increased a grade or two by the end of the growing season in September. *Viburnum*, although more than

doubling in size, was not considered large enough for sale and therefore not claimed to have gained a grade.

This technique of heating plastic-covered structures results in excellent plant growth with a number of species and should have application for producers of ground covers, lining-out stock, and container grown stock. To determine whether this concept of heating and ventilating is economically feasible for nursery crops produced in plastic structures will be studied in research now in progress.

LITERATURE CITED

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RALPH SHUGERT: Thank you very much, Elton.

We will move right on to our next paper which is entitled "Growing Nursery Stock on Organic Soils", and to tell us about this will be Jan Jansen.

GROWING NURSERY STOCK ON ORGANIC SOILS

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Growing ornamental plants on organic soils is not something that is uniquely new, nor is it something that has been done only on the North American continent.

Nurseries growing ornamental crops on organic soils have long been established in the various areas of Europe, with perhaps the most well-known area being the Boskoop region in The Netherlands. In the United States, many of our cutflower production areas in Florida are on muck. Greenhouse forcing azaleas are also grown in Florida muck and are subsequently shipped throughout the country.

Most research and production work, however, seems to have been concentrated primarily on edible crops, principally vegetables. In recent years, work has been done with the growth of blueberries and with turfgrass production on organic soils. Work done with