

spring and fall. On the other hand, flowering was heavy on Deutzia only where the tops were protected by wall of baled straw.

Similar protection tests have been set up for the winter of 1955-56. Here the plants have been set tightly together into five 4-foot wide beds as was done the previous winter. One of these beds has been left unprotected for the check, while the others have been protected with one of the following: mulch around and up to the top of the container, baled straw wall around all sides, lath snow fence around all sides, and roofing paper spread over lath snow fence around all sides.

With these three years of growing ornamental trees and shrubs experimentally in containers, there seems little doubt but that this is an entirely feasible method of producing nursery stock in Ohio.

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MODERATOR MATKIN: Thank you, Mr. Barker. It occurs to me that possibly the reason you think these Plaintainers are too small is because you have five-gallon-sized plants in them. Perhaps in the West we move them earlier than you do. We will postpone questions and discussion of the various papers until the end of the session.

Next on the program is a discussion of a typical operation in that great State of Texas. We have with us from Verhalen Nursery Company of Scottsville, Texas, Mr. John Roller.

Mr. Roller presented his paper entitled "Container-Grown Trees in Texas." (Applause)

CONTAINER-GROWN TREES IN TEXAS

JOHN B. ROLLER

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Container-grown trees in Texas are a fairly important subject. In the beginning, may I be permitted just a little missionary work. Container-grown plants and container-grown trees, just like the State of Texas, are with us whether you like it or not. At least, I am firmly convinced they are both here to stay.

There has been a great increase in population and a very great building boom in the Southwest as in all other parts of the country. As a result, there is an excellent market for plants and trees of all types. In some of our cities you can see from one place one or even two thousand homes that are under construction or have just been completed.

As each home is completed, the home owner wants to plant the garden and it makes no difference if he gets there in June, July, or August. With container-grown material he can immediately plant trees and shrubs and they live.

At Verhalen's Nursery, our program for this year called for about 20,000 shade trees in containers. They are not the best types of trees, but consist primarily of chinese elm, sycamore, poplar, Arizona ash and quite

a few ornamental trees. *Magnolia grandiflora* and mimosa are grown in quite large numbers but as those trees will not grow in the northern section of the country my remarks will deal mostly with two varieties of shade trees that will succeed in northern areas. These are *Liquidambar*, the sweet gum, and *Nyssa sylvatica*, the black gum.

We sow the seed in the spring and germination occurs immediately. We pot the seedlings using a mixture of half peat moss and half soil. The young trees can stay in the pot for one growing season or can be transferred to a one-gallon container after they have become established in the pot. It usually takes about six to eight weeks for the seedlings to become established in the pot.

Usually they are grown in the gallon size container the remainder of that season and should reach a height of 36 to 40 inches. There is a good market for trees of that size. I have heard nurserymen say that they would not plant trees that size, but we have found that there are a great number of people who enjoy planting small plants and trees. They like to see these plants grow. We sell a large number of three-foot trees in one gallon containers, but we also transfer a definite quantity into the five-gallon containers.

At the end of one growing season in the five-gallon container, the sweet gum tree will measure five to six feet in height. It can be grown another season in this large container, if desired. It is easily shipped, is fairly light in weight, and the transplanting losses are practically nothing.

We usually get our seed of the black gum in the early winter. They can be planted immediately and germination occurs in the spring. They are planted in a mixture of Michigan peat and sphagnum. It is not unusual for them to grow as much as twelve inches in a matter of three or four weeks.

The black gum is transferred to the gallon size container at the end of the first growing season. In one year, from seed, they reach a height of about 36 inches and are beginning to branch nicely. Later in the second season, they are transplanted to five-gallon containers and will have reached a height of seven feet at the end of the second season.

In regard to the soil mixture, the one thing in our mind which is paramount for container growing is adequate drainage. Our soil mixing is usually done mechanically in the field. We grow a cover crop for a period of about two years and then the soil is mounded with a road grader. To this we add equal amounts of peat, sawdust, and manure. The mixture is brought to our canning area in dump trucks and there it is run through a shredder where any further additions are made. Additions which may be added include additional moss, fertilizer, or lime.

It takes only a very small labor force to grow a large number of plants in containers. In fact, the labor force of possibly 18 or 20 persons can handle approximately a million plants.

Our method of watering is with overhead sprinklers. This is not a perfect system because there are wet and dry spots. We have not been able to eliminate either of these with the overhead sprinkler system. A dry spot can be readily watered by hand with a hose, but the wet spots remain a problem. For this reason, we add as much humus to our mixture as possible to improve drainage and aeration. Water is applied at a

rate of about fifteen inches per month during the growing season. Of course, it is heavier in the summer than in the spring and fall.

We fertilize at two week intervals. We alternate a dry fertilization with a liquid fertilization. The dry fertilizer is applied by hand, just by placing it on top of the soil mixture. Liquid fertilization is done through a power sprayer. It is too expensive to put on through the overhead irrigation system. I believe that about one-third of the fertilizer is lost if applied through the irrigation system.

The dry fertilizer consists only of nitrate of soda or ammonium sulphate. The liquid applications are commercial products, such as Rapid-gro, Instant Grow, etc., which ever is more readily available. We depend upon the liquid fertilizer to supply the trace elements. Since our soil is high in potash, we do not need potash in the fertilizer treatment.

Briefly, that covers our method of growing trees and plants in containers. There is, however, one thing that does not necessarily enter into the growing of container plants but really is one of the big factors. This is the harvest. It is a very easy thing to go out and lift a container plant and put it on a truck on very short notice. Handling container-grown plants is not dependent upon the weather. To us, this is a very important point in favor of container-grown trees and plants. Another important consideration which favors container-grown trees is that trees, even to ten or twelve feet in height, can be planted in July and August without wilting or leaf drop.

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MODERATOR MATKIN: Thank you, John. I am certain that you have given some valid arguments for the use of container-growing in the nursery business.

Next on the program is a discussion on container-grown conifers in Illinois, by Mr. Jack Hill, D. Hill Nursery Company, Dundee, Ill. Mr. Hill is one of your well-known members.

Mr. Hill presented his paper, entitled "Container-Grown Conifers in Illinois." (Applause)

CONTAINER-GROWN CONIFERS IN ILLINOIS

JACK HILL

D. Hill Nursery Co.

Dundee, Illinois

It is a little difficult for me to sort out the actual differences between container-grown plants in Illinois and container-grown plants in Arizona, California, Texas, or New England.

I believe the thought with which I would like to begin is the analogy of what the container actually is. I have commented to many of you here in this group that there is evidently great preoccupation with the technique of growing plants in a container. Actually, it is the same plant, whether grown in a container or in the field. And the same factors—