

gator at the Arnold Arboretum, Jamaica Plains, Massachusetts, is chairman of this portion of the program and will moderate the discussion.

MODERATOR COGGESHALL: This part of our program, as in previous years, will be devoted to short talks on plant propagation. There will be a short question period following each talk.

The first speaker is Mr. F. B. Gorton, Gorton's Nursery, Harbor Creek, Pa.

Mr. Gorton presented his talk, entitled "Own Root Versus Grafted Plants." (Applause).

OWN ROOT VERSUS GRAFTED PLANTS

F. B. GORTON

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Until several years ago, many ornamental plants, that would not come true from seed and could not be propagated successfully from hardwood cuttings, were grafted, budded or layered. A few of these were the Japanese red maple, certain forms of magnolia, pink flowering dogwood, selected forms of Blue Spruce, rhododendrons, lilacs, etc. Since that time, however, tremendous strides have been made in propagating plants from softwood cuttings. In many instances this has eliminated the need for grafting.

The introduction of polyethylene plastic film, misting or fogging, and chemical rooting agents have created a mild revolution in the nursery industry. It has spurred the imagination of many propagators to experiment for new and better ways of propagating certain plants. From these experiments came a large number of new methods for inducing root growth on softwood cuttings. A few of these were the intermittent or constant mist systems, the Burlap Cloud method, the plastic case method, and the Phytotektor System. All of these systems, and several more not mentioned, are very successful in propagating large quantities of own-root plants at very low cost. The system you would use depends upon the climate in which you lived and the type of soil available. In the Northern part of the country, most of the various systems in use require side and top protection of some type. Most of the own-root plants, propagated by any one of the above mentioned methods, have a very low mortality rate while being grown and will develop into beautiful true-to-name plants.

At Gorton's Nursery, which is located in Northern Pennsylvania, we do all of our propagating in shaded, glass-covered cold frames and in a greenhouse. The cold frames are watered by hand and the greenhouse has an automatic intermittent mist system. Strange as it seems, the plants from the cold frames usually have a better root system than those from the greenhouse. As soon as the cuttings are well rooted, they are sprayed or dipped into a plastic wax and planted outside into well prepared and shaded beds.

As we are concerned only with own-root versus grafted plants at this time, we will not discuss the merit of the other methods of propa-

gation. For many years grafting was the main foundation for propagating the better than average ornamental plants. The usual procedure was to grow the understock for approximately two years, pot it up for one year, then do the grafting in late winter or in a few cases in late summer. In most instances the grafted stock would be plunged in damp peat moss, in a closed grafting case or so-called sweat box, for the union to callus. The propagator would then cross his fingers and hope for a good catch. For no apparent reason some years it was very good and some years very poor. This was especially true with the better varieties of blue spruce, which many propagators have eliminated from their work schedule. However, in the last few years, many changes have taken place to help eliminate most of these hit and miss methods. Grafting cases, or sweat boxes, are gradually being eliminated. Most propagators now place their newly grafted stock on top of the open bench instead of in the case, thereby eliminating most of the disease problems. This has been made possible by maintaining higher humidity in the greenhouse, painting the union or dipping the complete scion into para-wax or some other similar material, and by using polyethylene strips or adhesive plastic material to wrap the graft union. In this case, no waxing is necessary but a fairly high humidity in the greenhouse is beneficial. Many recent articles have given this phase of the industry a shot in the arm. Today more propagators pay attention to quality than to quantity and the percentage of good grafts is very much higher.

A plant that has been grafted properly will develop much faster than a rooted cutting. This is because the root system of the understock is two, and sometimes, three years old at the time the graft is made. This furnishes a tremendous push to the scion. With an own-root plant, the roots and top grow simultaneously and thus is naturally slower developing. However, if you allowed the own-root plant the additional time it took to develop the understock for grafting, the own-root plant would be as large, if not larger.

We have just touched the high spots with regards to propagating own-root plants and grafted stock. We would like to draw your attention to some examples.

(Editor's Notes Mr. Gorton displayed plant materials propagated by grafting and own-root plants. The following account has been edited for presentation in these Proceedings.)

1. Japanese Red Maple:

- a) 6-month old, own-root plant. The plant is straight with active buds spaced equally around the main stem. Following transplanting there has been extensive root development.
- b) 2½-year old, own-root plant. The plant has grown considerably in size and is already developing into a good shape.
- c) 1-year old, grafted plant. This plant is certainly larger than the 2½-year old, own-root plant. It will require a certain amount of pruning to shape it up. You must remember that this grafted plant had a three year start. Most grafted Japanese maples have a side shoot growing out

which make them rather crooked. It takes about a year after they have been planted out to get them to develop properly. In comparison, the own-rooted plant, after one year in the field, will be a much better shaped plant.

2. *Magnolia Soulangeana*:

- a) 6-month old own-root plant. The plant is in excellent condition. The very heavy root system is protruding through the bottom of the pot. A plant of this size will grow approximately 12 to 18 inches in one year.
- b) 2½-year old, own-rooted plant. Although this plant is only slightly branched, it is well developed and has a very heavy root system. This plant was cut back a year ago to encourage branching.
- c) 1-year old, grafted plant. Suckers readily form with this graft if a large understock is used, or the grafting is poor.

3. Blue Spruce:

- a) 6-month old, own-rooted plant. The root system on this plant is not as heavy as most other plants of this age. Many will die if not watched very closely. They are extremely hard to root. We have had our best results with cuttings taken from young plants and placed in a cool shaded house. We have used Perlite for the rooting medium.
- b) 4-year old, own-rooted plant. This plant is taking a natural shape with branches evenly spaced around the main stem and rather close together. A spruce on its own roots requires very little staking and pruning to develop into a nice tree.
- c) 2-year old grafted plants. These plants have grown more than the own-rooted plants and have very few branches on two sides. These grafted plants quite frequently develop their own roots after a year or two in the ground.

4. Red flowering dogwood:

- a) 6-month, own-rooted plant. It has a very heavy root system but it must not be allowed to freeze the first winter or it will be killed. Storage at 35°F is recommended until planting time.
- b) one-year old, grafted plant. The top, center bud did not develop very much, however, a side bud, adjacent to it, grew vigorously. This makes the plant rather crooked at the top. This is not serious, however, as it will disappear in another year.

5. Lilac:

- a) 2½-year old, own-rooted plant. This is an excellent example of a plant on its own roots. It is straight stemmed, very well branched, and of good size.

To summarize, the advantages of own-rooted plants are:

Great quantities may be produced in a very short time and at very low costs.

They develop more naturally with very little staking or pruning.

They are propagated in the summer, which eliminates the expensive greenhouse heating required for grafted plants.

It eliminates the necessity of growing and potting up understock.

It eliminates the disagreeable suckers that develop on grafted stock.

The mortality rate is very low.

The advantages of grafted stock would be as follows:

Grafted stock develop much faster.

Grafting can be done in the winter when other nursery work is at a minimum.

Grafting is the best way of propagating many plants that cannot be rooted from cuttings.

Grafted stock, in many cases, develops a heavy set of flower buds much quicker than own root plants.

MODERATOR COGGESHALL. Thank you, Mr. Gorton, for a very interesting discussion. There is sufficient time for a few questions.

MR. ALBERT LOWENFELS (White Plains, N.Y.): What success have you had over-wintering the dogwood cuttings?

MR. GORTON: Last year we had about 3000 in a cold frame. We lost all of them. This winter we are trying the method suggested at our meeting last year by Mr. Charles E. Hess. We have about 6000 in this trial.

MR. JAMES S. WELLS (James S. Wells Nursery, Red Bank, N.J.): Will you briefly outline your method with Blue Spruce cuttings?

MR. GORTON: We are only experimenting in a small way and, as yet, have not developed a satisfactory method for commercial production. This year we tried two different ways: in the greenhouse and in the cold frame. The cuttings in the greenhouse all rotted. Those in the outside frames developed a good callus and in some cases were starting to root. We lifted these cuttings, transferred them to the greenhouse, and lost everyone.

MR. C. H. HENNING (Niagara Falls Parks, Niagara Falls, Ontario): Do you make any attempt to use juvenile wood, or terminal or lateral growth?

MR. GORTON: No we don't. We make sure we use good, new growth.

MODERATOR COGGESHALL: Thanks, again, Mr. Gorton, for this discussion.

The next speaker, this afternoon, is Mr. Thomas B. Kyle, Bohlender Nurseries, Tipp City, Ohio, who will discuss the propagation of miniature roses by softwood cuttings.

Mr. Kyle presented his talk, entitled, "The Propagation of Miniature Roses from Softwood Cuttings." (Applause).