

4. ----- 1958 Propagating Dogwood by cuttings American Nurseryman, March 15.
5. ----- 1958. Propagating several species of *Acer* by cuttings. Jour. of For., Vol. 56, No. 6.

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MODERATOR NELSON: Thank you, Professor Enright. Are there questions to be directed to Professor Enright?

MR. WILLIAM FLEMER: Were any of these cuttings *Magnolia grandiflora* hybrids, or were they straight species?

DR. ENRIGHT: Straight species. We had very poor results with the hybrids we tried.

MR. JAMES WELLS: Have you tried any of the strong powders in place of the concentrated dip?

DR. ENRIGHT: Not very many.

MODERATOR NELSON: Are there any more questions? If not, we thank you, Dr. Enright for a most interesting presentation.

The next speaker on our program is Mr. Hans Hess who is going to speak to us on the subject, "Copper Beeches by Grafting."

MR. HANS HESS (Wayne, New Jersey): I feel somewhat out of place talking about grafting, after having heard all these fine speakers talk about the rooting of cuttings. However, up to this point I don't believe there has been much successful work done with the rooting of copper beeches from cuttings, and therefore, we still have to resort to the old and tried method of grafting.

Mr. Hans Hess presented his talk, "Copper Beeches by Grafting" (Applause)

COPPER BEECHES BY GRAFTING

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It would not be proper to discuss the field of grafting without giving a little time to the preparation which precedes this mechanical operation. I will therefore start at the very beginning and speak for a few moments about the seeding of *Fagus sylvatica*, the understock for its suntanned brother. Many have had difficulty in obtaining a good stand of seedlings even though they used seed which was apparently fresh. We have found that the seed of *Fagus sylvatica* loses its viability very rapidly and consequently planting immediately after receiving the seed is of the utmost importance. The seed generally arrives from Europe after the ground is frozen solid and therefore seedbed preparation before hand is necessary. Seeding directly on the frozen ground does not effect the germination and it generally reduces the danger of rodent damage. We have, in a few instances had to remove four to six inches of snow before being able to plant the seed and obtained equally good results. We have for the past few years treated our beech seed with red lead to avoid any rodent damage. The seed germinates very early, in fact it seems as though germination takes place as the frost leaves the

ground. The seedlings begin to break through early in April and at this stage are extremely tender. It is therefore necessary to have frost covers available at the time you uncover the germinating seed. We use the conventional four by six loot, reed mats and keep them available until after the middle of May.

In order to get maximum growth and prevent burning, the seedlings are kept under 50% shade for the entire season. A majority of the seedlings will develop to grafting caliper in one season, although with the carrot-like root system it is difficult to safely lift the seedlings and pot them before the leaves absciss. As you know, seedlings potted in a dormant condition during the fall are very slow to re-establish and therefore do not generally make a satisfactory understock. We have found it satisfactory, when necessary, to pot the plants in early September with a full compliment of leaves and place them under interrupted mist for a week. By potting the plants in full leaf and using mist, re-rooting is for all purposes immediate, and after three days we gradually reduce the mist until it is discontinued at the end of a week. A very satisfactory root system is produced by grafting time, since the plants do not become dormant until nearly January. You have probably noticed that the European green beech will hold its leaves even though they are dormant. If you pot them early, before a frost and keep them in the greenhouse, the leaves will stay green and certainly help the rooting action.

The procedure we generally try to follow is to pot the seedlings in early March into 2¼" rose pots and grow them a full season in shaded frames. This method provides an understock with a very sound root system and insures the greatest degree of success. We bring the stocks into a cool greenhouse late in November and keep the temperature as close to 50 degree F. as possible until we are ready to graft them in late January or early February.

Before going further I must stress the importance of scion wood selection. It is possible to obtain fair results with three or even four year old wood, although, for the best results and the most vigorous plant, current season's wood is by far the best. As mentioned previously, we graft our beeches late in January or early February, which period, from past experience is the most satisfactory. This we feel is related to the approach of spring which encourages more rapid uniting of the scion and understock. The scion at this time of year comes into growth much sooner, which we have found is important for good results.

A regular side graft has been our best method of uniting stock and scion, since it provides a maximum area of contact. The more nearly perfect the fitting of scion to stock, the better the percentage of survival after the first year. The grafts are tied with either a waxed string or rubber band, both are satisfactory. The newly made grafts are then placed in the grafting case at an angle, since the depth of the bench does not permit setting them up straight, with the unions above the peat. We use both regular sash or plastic covers with equal success. It is possible, however, with plastic, to eliminate daily ventilation until it is time to harden the grafts. The sash remain closed for the first week. After this period the grafts receive a gradually increasing amount of ventilation during the morning, until they are receiving about an

hours ventilation by the third week. After five to six weeks we gradually begin to harden the grafts by adding ventilation during the night. This is accomplished by placing wooden blocks of 1" x 2" first in front of the sash and later on the side. Eventually we remove the sash entirely at night. Ventilation for hardening is added in the daylight hours in the seventh week until the grafts are completely hardened at the end of eight weeks. The grafts are now ready to be set up straight and to have part of the understock removed. Complete removal of the understock is done when the plants are ready for shipment or for planting outdoors. The grafts can be planted in a shaded bed or placed in a larger container after danger of frost has passed. They should not be planted in field rows until they are three or four years old, if you wish to have some plants left after the first year.

Summer grafting has been quite successful for several nurserymen and is done during late August or early September. I believe Mr. Hoogendoorn has grafted his beeches in the fall for many years. These grafts should be carried in a cool greenhouse or a frost free storage frame the first winter to prevent splitting.

In summary, then, the successful grafting of Copper beech is dependent upon, a well established understock potted either while dormant in the spring or under mist in late summer, the selection of good scion wood, and finally on good grafting practices as regards well matched scion and understock, ventilation, temperature and moisture.

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MODERATOR NELSON: Thank you, Mr. Hess. Are there any questions?

PRESIDENT STEAVENSON: Hans, there is just one point that I missed. What do you do with the grafts for three or four years before they are established in the field?

MR. HESS: We recommend that they either be kept in a container of some kind or else kept in a bed where they are protected. The wood of the beech is very, very brittle and of course, the scion being wrapped also is small. If it is disturbed at all it may fall off at the graft level.

MR. GERALD VERKADE (New London, Connecticut): After the grafts leave the greenhouse and are either placed in a container or bed are the losses very high?

MR. HESS: I believe the loss of beeches the first season is by far greater than for most other grafted plants. This I would say is due primarily to the fact that the wood of beeches is extremely hard, and a union is never, very good. I would say that you have as high as a 20 or 30 per cent loss.

MODERATOR NELSON: Thank you very much, Hans.

The next paper listed on this morning's program is entitled, "*Cotinus coggygria* by Softwood Cuttings under Mist." I understand that Mr. Sjulm is not here and consequently, Mr. Gerald Pfundstein will read his paper. Mr. Pfundstein!

Mr. Gerald Pfundstein read the prepared paper. (Applause)