

A rootstock which has been potted the spring before the grafting season is far better than a fall potted stock. The next factor in order of importance is temperature. Pines are fond of cool temperatures and a range between 60 and 70 degrees in the grafting case generally gives the best results. We have found that a little ventilation of the grafting case during sudden warm spells is preferable to shading, which reduces light intensity.

A side graft has been our most successful method, although a veneer type can also be used. Finished grafts are placed upright in the bench the union covered with sand which is watered lightly to exclude air pockets. A plastic cover is put over the bench during daylight hours and removed at night. The plastic cover is entirely removed when the scions begin to grow, this we find causes the least amount of shock to the newly healed graft. The root stock is reduced by some 50% when the plastic cover is removed and the balance removed as new growth on the scion begins to mature.

Nurserymen graft Pines to reproduce the many types now of such keen interest. Foresters graft Pines to reproduce good seed bearing types, observed in stands of forest plantings. These grafts help increase good seed bearing trees since they begin producing seed much earlier than would a seedling.

A recent article in a Forestry Magazine showed a forester obtaining his scion wood from trees forty feet or taller with the aid of a riffle. This would not be a profitable method for the nurseryman but I can see the advantage to the forester in saving all those steps.

In conclusion, for successful grafting of Pines, spring pot your rootstock, be sure you use compatible scions and stocks, keep your grafts on the cool side and use the most vigorous scion wood available.

Thank you.

MODERATOR O'ROURKE: Mr. Wells, would you prefer to give your paper now or hold it until Friday evening?

MR. JAMES WELLS: As you wish, Steve. It is actually a resume of Mr. Spaan's work which Roy mentioned earlier.

MODERATOR O'ROURKE: Suppose we have your paper now, because it ties right in with the others you have just heard. (Mr. Wells presented the following paper prepared by Mr. John Spaan.)

GRAFTING PINES OUT-OF-DOORS

By John Spaan
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Probably the most blame for failure of the grafts can be traced to the condition of scions at grafting time. Scions should be taken only from the season's new growth, and must be made of firm, semi-mature wood.

While several Pinus sylvestris types produce fairly even textured new growth, others have variable stages of growth, containing both firm and soft wood over a period of time. Pinus sylvestris fastigiata is very good for an even supply of scion wood, while many types of Mugho pine vary as much as 6 weeks or more. Scions should be 2-1/2 to 3-1/2 inches in length, and all needles, excepting one inch at the top, removed. Fifty or sixty scions at a time can be prepared, for the operator to carry in a container under a damp cloth.

The side graft method should be used when grafting pines at the ground level in nursery rows this time of year. Since the scion must always be placed on the north side of understock, the rows of understock should be planted in north to south direction.

The understock should be polished clean, 4 to 5 inches just above ground. At the lowest part make a one inch cut downward and inward. At the bottom of slash, cut again slightly downward to remove slash cleanly. This cut should be as deep as half the thickness of the scion to be used. Cut scion to fit slot, smooth in bottom and sides, and tie in place, which should be firm but not too tight. Then, since rubber is probably used, tie once again, but a little looser as protection for the possible loss of the first band. Scions can be a trifle smaller, but never larger than the cut made in understock.

Grafting and tying should be done by the same person for utmost efficiency, and anyone with even a rudimentary knowledge of grafting should be able to perform this work in a short while in a comfortable manner.

Tying can be done with raffia, cotton twine, or rubberbands, but rubber is easiest and quickest but requires more checking unless tied twice.

No waxing is required, but the actual grafted part should be covered with sawdust mulch, leaving just the top with needles sticking out. Mulch prevents weeds and helps protect grafts in wind or frost conditions. Twenty days later, 30% to 40% of understock tops should be removed, and the following spring, just before growth starts, the lower part should be cut, leaving a 3/4 to 1 inch stub just above the graft.

SPRING

Graft failures, can at this time be replaced with a saddle type graft, if larger scions are available.

Slice off the understock just below the old sidegraft leaving a

2 to 2-1/2 inch stump which is evened by a 1 inch cut on either side. Place a scion of the same size with the triangle removed, and tie downward two times and replace sawdust mulch. Although somewhat slower to make than the sidegraft, the saddle graft, in this favored part of spring, is far superior in every way for producing more and stronger living grafts. However, grafting time is quite short, but could probably be extended for an indefinite time, if dormant scions could be kept in good condition. This, I have never tried.

For standard or multiple grafting, side or saddle grafting is optional, with the operator, of which there do not seem to be any, although it is by far the most interesting, since any pine from small Bonsai up to seed producing trees can be grafted.

When topgrafting, after the graft has been tied once, pull up needles right below the graft, or pull a small bundle from another part of the tree, and wrap them around the tied graft, tie two or even three times as protection for first band, since erosion is faster than on the ground. The so-called pigmy pines must be either veneer grafted or on pieceroots since rooting cuttings is seldom practical and too slow. The softer needled *P. parviflora* and longer tender needled *P. Tanyosho* and other *Densiflora* types are much more sensitive to outdoor grafting, and are probably best grafted with a veneer type of graft. Such a graft must be made in spring's favorite days, since a veneer graft would be a poor risk for winter weather except in some much favored locality. However, if firm and large scions of *P. Tanyosho* are available, they can be side or saddle grafted quite satisfactorily and will make a standard tree that is out of this world.

Both Spruce and Hemlock all can be grown and grafted in the open, but haven't done very much work with them, and pines are the leaders anyway.

Happy landing to the future pine grafters.

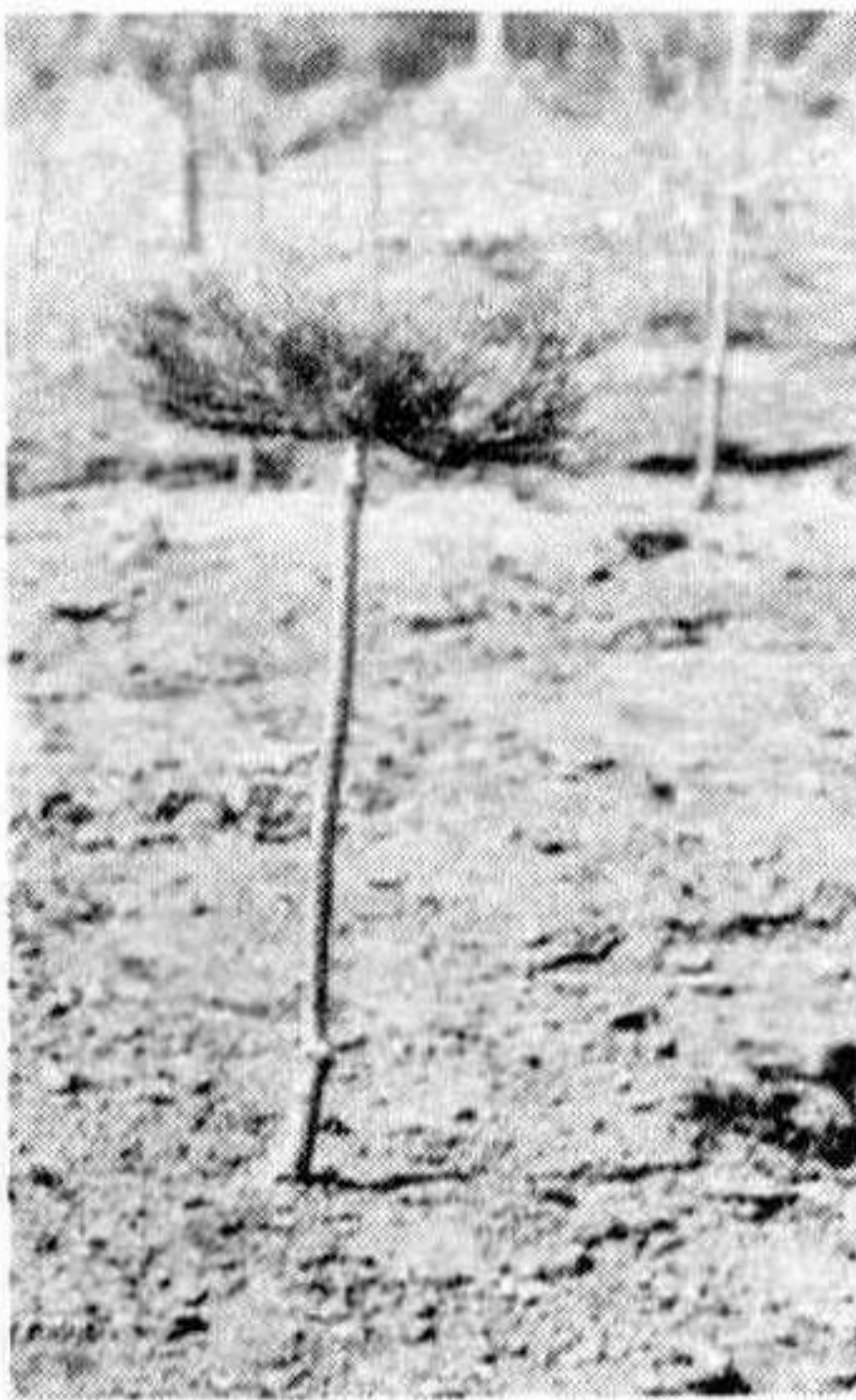


Figure 1

PINUS MUGO MUGHUS
Grafted on a 30" Standard



Figure 2

Six 3 year old grafts of dwarf
PINUS MUGO MUGHUS
on a standard 5 feet tall, 7 years old.

(Editors Note: After a brief recess the morning sessions resumed with a panel discussion on root cuttings. The moderator was Mr. Fred C. Galle, Ida Cason Gardens, Pine Mountain, Georgia).

MODERATOR GALLE: Root cuttings, of course, is an overlooked phase of propagation. I think it is one of those phases you have to dig into the group to find out and then you realize it is not as unusual as some of the other media. If you check the literature there is just one page in the Standard Propagation Book. That is all that is mentioned. The rest is left up to you. You can find some references in books out of this country, more references than we have in American literature.

With that, I am going to introduce Ken Fisher, who will be the first on the Propagation of Root Cuttings from Perennial Plants.

MODERATOR GALLE: We will go on with our next speaker, Bill Flemer from Princeton Nurseries.

PERENNIAL PLANTS FROM ROOT CUTTINGS

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There are a limited number of perennial plants that can be propagated by root cuttings. However, throughout the country there are many thousands of plants produced by this method, since among others, Oriental Poppies and Phlox decussata are handled in this manner.

Perennials that are to be propagated by root cuttings, are no different from woody plants in that their roots must be capable of producing shoots. Such shoots are developed from latent (dormant) buds laid down in the initial period of growth, or from adventitious buds formed after the root cutting has been made. Such adventitious buds usually occur in the larger portion of the roots, closer to the crown of the plants.

Generally speaking, in our area (Lake County, Ohio) root cuttings are made in late fall or early winter. For this purpose the desired number of plants are dug in late fall and stored in a cold frame or similar place, until the propagator is ready for them.

The one exception is Oriental Poppies (Papaver orientale), which must be handled during the summer while dormant. July is about the best time. This gives the root cuttings time to make new roots and tops before the onslaught of winter, and the young pot plants can be kept outside in a cold frame over winter.

Healthy one year parent plants are selected and the firm roots about an eighth to three sixteenths of an inch in diameter are broken off at the crown, by an upward pull. Keep them on the bench all