

(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

lying in the same direction. While older parent plants can be used, you will find that well grown one year plants give a higher percentage of usable roots.

While some references claim the cuttings should be made and stored to callous, we, and I believe all others in our area, pot them immediately.

Some growers make a straight cut across the top of the cutting and a slanted one across the bottom, to make certain that proper polarity is kept. This requires extra handling since you make several cuttings from each root, and it entails squaring off the upper end each time.

A faster way is to use what we term a cutting board. This latter is any piece of smooth wood about eight to ten inches long and six inches wide. This is then marked with arrows to one edge. The roots are cut on this board with the tops to the marked edge. In this manner several roots can be cut off at the same time, slicing them off about one and one half inches long, until you get down to too small a diameter. In doing this you do get some small diameter roots on the cutting board as well as some that are too short. These are discarded at potting.

When the board is reasonably full with the cuttings it is taken carefully to the potting bench, and the roots are potted, top end up, into the pot selected. We used to use 2" clay rose pots, but have gone over to Jiffy Pots. We try to get the cuttings just under the surface of the soil. The pots are watered and set immediately into the cold frame where they are to stay all winter.

Even though potted, I cannot stress early planting to the field too strongly, if you are to have salable plants for fall. So set them out as early in the spring as you can work the soil.

Phlox decussata. While they can be handled in much the same manner, *Phlox decussata* lend themselves to a simpler treatment. The propagating plants are dug in the fall. (For our area it is usually just before or just after Thanksgiving.) We leave some soil on the plants and store them in apple boxes in an unheated building where they will not freeze or dry out. Here again we are talking of one year plants.

After the first of the year, the larger roots are pulled from the crowns of the plants and cuttings made in the same manner as described for poppies. From the cutting boards we place them into boxes or crates of soil.

We usually use grape crates. The bottoms of the crates are covered with about an inch of soil. With these boxes tilted on end, soil is placed against the end, and a row of cuttings, top up, is placed against the soil. Alternate rows of soil and roots are used until the crate is filled. We use enough soil to keep the rows of cuttings about an inch apart. We find it best not to cover the roots

entirely until the crate is placed level on the bench. Then a layer of soil is used to make certain that the tops of the root cuttings are covered about one quarter of an inch. These boxes or crates are watered once rather heavily and if necessary more soil added to cover any exposed root tops.

These crates are then placed into a cool greenhouse, where new roots and tops are formed. The house we use is a plastic one with one heating pipe so that we can prevent freezing. In other words, temperatures range from 35° to 45° F. most of the time. The cuttings are left in the crates undisturbed until planting time. When they are to be planted, the crates are taken directly to the field and the small plants troweled into the soil. If planted out in April or even late May, they will make sturdy young salable plants by fall.

The growing of Anemone japonica is a combination of the above methods. Generally speaking this plant should only be planted in the spring, and therefore it is offered as a Spring Pot item. The field plants are dug usually in mid-November, at which time the cuttings are made and boxed as with the Phlox just mentioned. Instead of leaving them in the crates or boxes, they are potted off after they have made new roots and the tops have begun to grow. These pot plants are then grown on in the greenhouse for late spring sales or to be planted to the field.

Anchusa myosotidiflora and named Stokesia such as Blue Danube, are readily propagated by root cuttings. In our operation we usually sow the cuttings on top of the bench, in a section that has been filled with good potting soil, and then cover the cuttings with about half an inch of sand. This can be done in January or February. If given some bottom heat they come right along, and in about a month are ready to pot. Here again we use Jiffy Pots. After the potted cuttings are well rooted and growing well, they are transferred either to a frame or an unheated plastic house to gradually harden them off so that late spring frosts will not damage them. The plants are ready to go to the field in late April to mid-May.

Named Rudbeckia such as The King are also propagated by root cuttings. We stand the cuttings up in rows as we do with Phlox decussata, and then pot them off after they have begun to grow. I will have to admit that our percentages of take are rather low most seasons.

Gaillardia may also be made in this manner, and we do so with the variety The Warrior. The more common named varieties come quite true from seed if obtained from a reliable source.

Echinops can also be increased by root cuttings. Ritro of course comes true from seed, but selected named varieties such as Taplow Blue can be increased by this method.

Several authors mention Dicentra spectabilis from root cuttings. We prefer to use the eyes for potting in late fall. (They can also be set directly to the field if done early enough in the spring.)

Stem cuttings under mist in the summer also give good results. The information on this method I find is scanty. A couple of references mentioned pieces of roots three inches long to be planted deeply in the soil. This to be done right after foliage turns yellow in the summer. Perhaps that is how it is done in Holland, since imported plants have a long "neck" with most of the eyes along that part, indicating that they were planted quite deeply. One nurseryman I talked to said he understood that such a method required two years. Perhaps that is why it is only mentioned in references I have seen.

Listed below are other perennials which, in one text or another, give root cuttings as a method of propagation, but without further details. Since we either do not grow the plant at all, or if we do it is by another method, I cannot give further details:

Arabis
 Asclepias
 Dictamnus
 Gypsophila paniculata
 Lobelia
 Plumbago (Ceratostigma)
 Saponaria
 Saxifraga
 Trollius
 Yucca

I rather imagine that in some of the above instances there may be confusion of a technical nature, as for instance on first thought we think of Plumbago larpentae as being propagated by root cuttings. Since however, one selects the growing tip end of the "root", more technically we are dealing with an "underground stem". Off-shoots of Yucca, I think, would be classified as rhizomes, which technically are underground stems.

References: Plant Propagation - Mahlstedt & Haber
 Propagation of Plants - Kains & McQuesten
 Commercial Flower Forcing - Laurie & Chadwick
 The Book of Perennials - A. C. Hottes
 Contemporary Perennials - Cumming & Lee
 Popular Perennials - T. W. Sanders

PROPAGATING WOODY PLANTS BY ROOT CUTTINGS

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The root cutting method of propagation is one of the least frequently used of all the methods of vegetative propagation. The primary reason for the relative rarity of this method is that the plants for which it is the best technique are infrequently grown in the average nursery. A secondary reason is that it is relatively inconvenient to