

When that scion bud starts, we have that stem to tie it to, and we do not place a stake to the side. We don't put up the stake until the new shoot is up about three feet high. This year, I am going to bend them at that time. When they begin sprouting, we will put in the stake and cut that five inch stub off.

CHAIRMAN FOWLER: How many years do you have to stake this tree before it will support itself?

MR. LONG: If I can put them out on the street with plenty of low branches, I don't need a stake or a support more than two years. If they go out straight, it may take six years, and so we have to go back and restake them. The little extra trouble I can go to in training is worth it.

CHAIRMAN FOWLER: With *Pistacia chinensis*, does a root bound condition in a gallon can indicate a complete loss?

MR. LONG: Well, it's a complete loss as far as the use that we have for it. I wouldn't take one of them even as a gift.

Chairman LeValley introduced Mr. Robert Weidner, Buena Park Greenhouses Inc, La Habra, California.

PROPAGATION OF TROPICAL PLANTS FOR THE FOLIAGE PLANT TRADE

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There is scarcely a species in this field that is difficult to propagate. There is scarcely a field where disease is so great a factor. For this reason, we can never separate disease control from propagation.

We have reduced cutting loss to a point so close to zero that it no longer interests us to figure loss. Cuttings grown under glass are expensive! We cannot afford to lose them.

In addition, under the sanitary conditions of the U. C. System, we have cut production time almost in half by being able to propagate a large percentage of our material in the pots in which they are sold. For example, Crotons take twenty-eight days to root to satisfy us. If rooted in bed, bare-rooted, then potted, we must allow nearly the same time for establishing. By rooting in the pot, we use merely the twenty-eight days. From our point of view, this is a gift of 60% to 70% more greenhouses.

We have the usual aids — low and high pressure mist, heating cables, fan and pad cooling, etc. We have learned from our use, which aids fit which plants.

We might divide all our propagation into several classes by methods.

- Leaf Cuttings
- Tip Cuttings
- Cane Cuttings
- Leaf & Eye Cuttings

Leaf Cuttings. — The joys of this world would rapidly increase if all our plants would so respond. We get a heavy production of leaves per plant. The commonest plant so propagated is the African Violet, yet the method does move into our field. Peperomia Emerald Ripple is our most popular number propagated by leaf cuttings. An essential part of growing this plant as a stock plant is in its watering. We try to minimize water on the foliage. Splashing spreads any disease there might be present, and there is always disease present. Leaves are stripped off with almost all the petiole. They are removed to the propagation area. We have devised a small tool to reduce petioles to a required and standard length.

Cuttings are then dipped in our “triple dip,” which consists of:

1 cup Parzate

1 ounce Terraclor

2 tablespoons (heaping) Agrimycin 100

Use in three gallons of water.

Keep agitated while using.

Insertion is then made in a peat and Perlite mix.

Tip Cuttings — Tip cuttings are similar to any propagation from tips except for a few points. Above and beyond all else, we cut to leave the most vigorous leaves on the stock plant. We have amply proven to our own satisfaction that complete or even radical stripping of a stock plant is very costly in terms of subsequent production. Depending on how they are to be sold — long distance or close by — we either insert these cuttings into flats or pots. We use flats heavily, contrary to normal greenhouse practice of beds, to gain greater mobility. Cuttings are often developed beyond the need of propagating conditions, but may need more maturing, or delayed to fit a customer's desires. Those we can shunt to another house.

In potting, we are often faced with extremely large cuttings, for example *Philodendron pertusum*. *Philodendron pertusum* is a plant that we propagate from cuttings which might be up to two feet tall. It would be an absurdity to try to root them in beds or flats. Though they would root well, we would sacrifice greatly by having such a large leaf area on a bare-root cutting. Therefore, we pot them. This is also true of *Dieffenbachia*. To pot them in a pot of soil commensurate with the size of the plant would throw a weight factor prohibiting long distance shipping, especially by air. Therefore, we substitute sphagnum moss. Sphagnum is light weight, water retentive and an ideal rooting medium for these tropical plants. Again harking back to the huge leaf surface of these plants, we must pay minute attention to humidity. Most tropical plants have a minimum of defense mechanisms from drought. Therefore, we use mist systems constantly over these cuttings. We also violate another rule, and do have a medium on the benches in propagation to hold the plants up. They are so light weight on the bases that without this, they would fall like ten pins if somebody blew on them.

In tip cuttings of the huge variety of small plants, we again vary our techniques, depending where the plant is to go, and somewhat, but not greatly by the variety of plant. On certain Peperomias and *Philodendron*, we use nothing but pure peat. Rooting is accomplished as

well or better with some Perlite added, but when they are wrapped for shipment, the slightest abrasive substance would cause a scratch on a leaf that would render the plant unsalable. On most of our tip cuttings we use a preventative dip in what we call "the triple dip." There are some plants that we found are inhibited in growth by Terraclor, others blanched by Agrimycin, so we avoid where experience teaches us. In addition, some extremely large plants cannot be dipped without bruising. In all other cases, we use the dips. It has been our experience that this is 50% superstition, 25% "being chicken," and 25% value. If there is a heavy infestation of *Rhizoctonia* or *Phytophthora*, no dip we have yet found will save our necks

Cane Cuttings. — Cane cuttings are another very large source of supply. We often take cane cuttings of plants where we also use tip cuttings, to achieve a small type plant for a different use on the customer level. Emphasis cannot be great enough at the way of keeping the plant clean. On the majority of cane cuttings, we like to strip the leaves, cut them into the eyes and dip them in the "triple dip." They are then inserted horizontally and given a light covering of peat and Perlite. The problem in the use of cane cutting is in the maturity of the wood. The cuttings nearest the base are very mature, nearest the tip, very immature. Germination of the eyes varies with this maturity. We are, therefore, faced with a long period of time for the complete potting from a bench devoted to cane cuttings. In the case of *Philodendron pertusum*, we have at least one full year before the last plants are removed from the bed. We, therefore, put these cane cuttings in closer than we would normally like to do, and thin as they reach a certain determined size

The final general classification of vegetated propagation of foliage plants would be one which would probably cover the greatest number of plants propagated, the leaf and eye cutting. The most popular of all foliage plants, the *Philodendron cordatum* and the second most popular, Pothos, are propagated in this way. We let them grow into vines and when they have reached an economical length from 18" to 24" they are cut. You will note that we grow stock plants in pots. This is contrary to other peoples' methods, but we have satisfied ourselves again that this is best for us. First, we gain more plants per square foot. Second, we get more light exposure on every leaf. Third, we are able to rogue quickly if a plant reverts, or if any sign of disease problem creeps up. The leaves are then cut 1/2" above the eye, 1" below. The stem below the eye affords a good anchorage when potted later. In most cases, these are inserted at a very close spacing, because we will pot them when the new growth begins.

There are other cases where we grow two to three leaves on the new plants necessitating a 2-1/2" by 3" spacing. From a propagator's point of view, I cannot over emphasize my belief in disease control. The great results we have achieved in our field have proven it to me. We have taken plants that are traditionally slow and made them rapid plants. We have been impressed with the loss of vigor in propagation and in future growth that minor disease can cause. We like to use the

example of a cold in a human being. Few people die from colds, but few are very efficient when they have them. We have been working under the U.C. System since its inception, and probably are the world's greatest salesmen of it. There are a few different things that we have bumped into, since using the system. Some of you are familiar with them, but I think they are worthy of repetition. One item is the penalty for sterile conditions. If someone goofs and allows disease to enter, it will sweep through much more rapidly than it would in an unsterile condition. This is leading some investigations at U.C L A. into the use of a steam air mix where a better job is done at lower temperature, leaving competing organisms in the soil.

Another puzzle that is bumping into us as we strive to achieve the best possible plant is what makes a good propagating stock plant. We are leaving the belief now that the plant grown to our best ability for sale, a good stout, sturdy plant, is necessarily the plant that responds to propagation best. This is contrary to former beliefs. When we have left the problem of disease behind us, we have entered into many problems of this kind that we would formerly have blamed on disease.

Once upon a time, a highly skilled propagator was a kingpin. Partly due to depression conditions, partly due to misguided information from research stations, the propagator's star waned. One would have thought, from bulletins of some years back, that all propagation could be done on a mechanical basis. The more we work with mechanical contrivances, the more we appreciate the fact that propagation, at its best, is the work of a most skilled man in the nursery.

The following questions were asked during the Question Box

CHAIRMAN HERB FOWLER: Are cuttings totally immersed in the "triple dip"?

MR. WEIDNER: Most of the plants are completely immersed. On plants that give us a great deal of trouble, we give as long as a 10-minute soak. Ordinarily, it is just a dip.

CHAIRMAN FOWLER: If the "triple dip" doesn't stop major outbreaks of disease, what does?

MR. WEIDNER: I don't know the answer, but it has been our experience that no chemicals stop major outbreaks. We have found that all we can do is to follow the mechanical method that I described of growing the plant up well-above any water lines or splash and taking the cutting above that level.

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