A Simple Frame for Softwood Propagation

At the Arnold Arboretum's Dana Greenhouses the propagation of woody plant cuttings is carried out largely under polyethylene plastic, except during summer when intermittent mist is employed. The structures and system presently in use have reached a high degree of efficiency due to testing of new ideas and adoption of improvements seen elsewhere.

With the advent of polyethylene plastic film, a great deal of the finicky care previously required to root cuttings has become unnecessary. The plastic material is air permeable, yet vaporproof; this permits a high relative humidity to be maintained, and by reducing transpiration prevents the cuttings from wilting.

By modifying and adapting certain components of the Arboretum's carefully controlled system, amateur horticulturists can propagate easily cuttings that previously were considered difficult. The ensuing device is a simply constructed polyethylene propagating chamber which may be placed outdoors and left for weeks on end without attention.

Plate 1 shows an assortment of plants that were rooted from softwood cuttings in such a frame. They include shrubby dogwoods, viburnum, magnolia, buddleia, weigela, and pachistima.

Plates 2 and 3 illustrate the preparation sequence. First, a site is chosen which offers as much light as possible without direct sunlight. (A location on the north side of a house, wall, tree, or such would be satisfactory.) A standard 1 by 2-foot greenhouse flat is pressed against the earth to show its outline, and the soil is then excavated to a depth whereby the flat's edges will be level with the surrounding soil.

Next, two-mil polyethylene plastic is cut to line the flat with enough surplus so that it extends about 2 inches on all sides. The medium (in this instance, half sand and half horticultural grade perlite) is added and slightly firmed.

Plate 2 shows a flat with three rows of cuttings inserted be-
neath a structure of turkey or utility wire which has been cut and bent so that it will support the plastic about 6 inches above the cuttings.

It is important that this framework lie flat at the top, rather than in a curve as is sometimes suggested. Temperatures within the little propagating unit are warmer than the surrounding atmosphere and consequently water continually condenses on the inner surface, then accumulates in droplets which become too heavy to remain. These fall back on the cuttings and into the medium, thus creating an environment of continual moisture. A flat surface above permits even distribution of the falling drops whereas a curved top directs them to the side walls and down, leaving the center portion of the chamber dry.

Collection of Cuttings

It is well to gather softwood cuttings early in the morning for at this time they are in their freshest condition. Only wood of normal growth should be chosen. Immediately on collection, the cuttings are placed in polyethylene bags which are tightly sealed with rubber bands. The bags are not squeezed to exclude air and this permits packing them on top of one another without crushing the contents.

To prevent a buildup of heat within the bag, it must be shielded from the sun. At the Arnold Arboretum we put cuttings into styrofoam or picnic-type coolers and this has proven highly satisfactory. In the event that the cuttings cannot be processed immediately after collection, they will remain fresh for a week or two if stored in a refrigerator at 40 degrees.

Making the Cuttings

The leaves are removed from the part of the cutting which will be below the medium, and a slanting cut is made below the node or nodes (the place on the stem which normally bears a leaf or leaves). If the tip of the cutting is soft and rubbery, it too is removed as it could decompose, thereby inviting fungus infection.

Root Inducing Substances

A number of root inducing substances may be employed. Hormodin #2 or Hormo-Root “B” are used on most softwood cuttings; Hormodin #3 or Hormo-Root “C” would be needed for the more difficult subjects such as Ghent azaleas, stewartias, and so forth.
To prevent contamination, one should work with a small amount of the root inducing material on a piece of paper rather than dip directly into the supply container.

Softwood cuttings are generally moist enough so that it is unnecessary to wet them before applying the auxin. The bases of the cuttings are dipped into the powder just deeply enough to cover the newly-cut surfaces.

**Insertion of Cuttings**

The cuttings are now inserted in the medium after a hole is made for each large enough to receive it without brushing off the root inducing material. An important point to consider is that cuttings should not be overcrowded. Enough interspace should be left so that air can circulate around the cuttings and light can reach the medium. This sanitary measure aids in preventing problems with diseases. See Plate 4.

Next the cuttings are watered. This serves two purposes: first, it compacts the medium around the cuttings, and secondly, it provides the initial watering.

The framework is put in place and covered with the polyethylene plastic; soil is then mounded over the plastic where it meets the ground. It should be emphasized that with this system of propagation it is imperative that all air leaks be eliminated as they could reduce the very necessary high humidity and cause failure.

**After Care of the Propagating Case**

After initial watering it is unlikely that any further moisture will be needed. It would be wise, however, to check the cuttings each week or so to make sure that fungus infection is not occurring, or that insects are not present which have hatched from unnoticed egg masses.

Inspections can be made through the transparent polyethylene without its removal. It is unusual for problems to arise through the activity of fungi; however, in the event that this does occur, the covering should be lifted and infected cuttings disposed of. The remainder may then be sprayed with an application of 50% Captan at the rate of 2 teaspoons in a gallon of water.

**Tests for Rooting**

After several weeks, the cuttings are checked for rooting. This is accomplished by grasping each with thumb and forefinger. A gentle upward tug will show whether the cutting has
rooted. Heavy resistance indicates an extensive root system; slight resistance, either a heavy callous or small roots; no resistance, the absence of roots altogether.

Potting or Boxing

Once the cuttings are sufficiently rooted, they are carefully lifted from the medium and immediately potted or boxed. Material rooted under conditions of high humidity and temperature must be brought into normal atmosphere gradually. This is accomplished by again covering them with polyethylene.

On cloudy, humid days the plastic can be removed; and if several such days occur in succession, the transition will be complete. Otherwise, uncovering the cuttings at night and recovering them during the heat of the day for a period of five or six days will accomplish this very necessary conditioning.

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