

transferred to either a larger-size pot or to a transplant bed until it has reached outplanting size.

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PROPAGATION BY CUTTINGS OF LILACS AND OTHER HARD-TO-ROOT SPECIES BY THE SUB-IRRIGATION METHOD

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At Weston Nurseries we have been rooting cuttings of lilacs for over 40 years — even before mist systems, polyethylene or rooting hormones were introduced. Our early lilac propagation was done in a pit greenhouse shaded with lath several feet above the glass. With careful supervision and occasional hand watering the cuttings rooted quite satisfactorily, particularly the deeper colored cultivars. In more recent years, we have been rooting lilacs in poly tents or with mist. None of these methods have proven reliably satisfactory for many cultivars, particularly the white ones. Today I would like to explain our sub-irrigation method. This is simply applying water to the cuttings from beneath the rooting medium. Metal pans are the only equipment we use at the end of a greenhouse shaded with 60% saran cloth and shielded from direct sunlight with white polyethylene. The pans (8 ft. × 3 ft. × 6 in.) are filled with $\frac{3}{4}$ inch stone to a depth of 2 inches and the rest with horticultural-grade perlite.

The stones are separated from the perlite with a fine-sized plastic mesh screen. We insert a 4-inch perforated drain tile in each corner of the pan. With this set-up we can fill the pan by pouring water into the tiles, thus letting the water run through the stones and gradually rise uniformly in the perlite as high as we wish. The pan is filled with water the day before the cuttings are stuck. The perlite is thus saturated and when the water is siphoned out prior to cutting insertion, the perlite becomes naturally compacted.

We take the lilac cuttings at flowering time and try to finish before the flowers fade. This assures us a uniformly-developed cutting each year and true-to-name cultivars, as we cut only from flowering plants. Cuttings are gathered early or late in the day and refrigerated overnight. We heavily wound one side before applying Hormoroot C. The cuttings are stuck close together in a three-inch-deep slit cut with a label. After sticking the cuttings the pan is again flooded with water until the cuttings are turgid. This may be for several hours or overnight, depending on weather conditions.

The normal operation of the rest of the greenhouse is maintained without particular regard to the cuttings in the pans. The pans seldom need to be refilled with water again before the cuttings are rooted. Occasionally, due to unusual heat and ventilation requirements, the cuttings may wilt and require a few hours of water until they recover turgidity.

Cuttings begin rooting in a month and most of them are ready for potting in about 6 weeks. After potting, normal watering is all that is necessary. Roots grow rapidly and the plants can be put in cold frames or even planted out in several weeks.

The rooting percentage is over 90% for all cultivars, except *Syringa vulgaris* 'Primrose', which has been about 60%. Cuttings that do not root fall into two categories. The majority remain green but do not callus and gradually become weaker. They may be weaker cuttings to begin with and could possibly be selected out before they are made. The other loss occurs when cuttings dry up completely. This happens on individual random cuttings and could be from mechanical or physiological causes. The key to the success of this method of propagation lies in the fact that dead and dying cuttings do not contaminate other cuttings. No further losses occur as conditions for spreading disease are greatly reduced. The cuttings are never watered from the top, misted or covered with poly; the well ventilated greenhouse conditions keep the leaves dry at all times.

This simple sub-irrigation method seems to be the best way to root plants that do not tolerate excess water on the foliage or are susceptible to diseases in humid conditions.

It seems that almost all cuttings will root satisfactorily with this method and we have had good success with *Hamamelis*, *Prunus*, *Viburnum*, *Cornus* and *Magnolia* species. After four years of production we can recommend sub-irrigation as certainly being the most reliable way to root white lilacs.

PROPAGATION OF NAMED DELPHINIUM CULTIVARS

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In *Plant Propagation: Principles and Practices*, 2nd ed., Hartmann and Kester say that "Delphiniums can be propagated easily by softwood cuttings taken in the spring." Unfortunately, they omit to say how. After struggling for five years with a variety of techniques, we finally came up with a system which is a combination of several ideas gleaned from the *Journal of Delphinium Society*.

Stock plants are dug out of the fields in the fall and all leaf and stem remains cleaned off. They are packed in wooden crates with slightly moistened shingle-tow around their roots and crowns, leaving their tops exposed. The crates are stored at 36°F and brought into a cool greenhouse in mid-January to promote new growth. The greenhouse night temperature is set at 45°F and the house is well ventilated on sunny days to prevent the shoots from becoming too soft. They are left in the shingle-tow to facilitate easy removal of the cuttings. Shoots appear in about two weeks and the first cuttings are ready for removal by mid-February. We usually take just the sturdiest shoots for they produce the most vigorous plants in the shortest time. The stock plants are either put back in the crates to get more cuttings, or are potted into 2 qt. pots using a peat-sand-vermiculite mix. When they have recovered, these plants are sold at our sales center with 2 to 3 vigorous shoots.

Cuttings are taken with a very sharp, pointed knife. It is essential to remove the cutting exactly at the interface of the old stem and the new shoot. This point can be identified by the swollen area at the base of the new shoot. If any part of the old stem is attached to the cutting it should be trimmed off for it will cause the cutting to rot. If the cut is made above the swollen area it will expose soft, pithy tissue or even the hollow area in the stem; this also causes rotting and removes buds which normally develop at the base of each stem.

To increase cultivars quickly we sacrifice stock plants and