

SOFTWOOD CUTTING PROPAGATION OF OAKS, MAGNOLIAS, CRABAPPLES, AND DOGWOODS

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At Simpson Nurseries we propagate trees in many ways including seeds, hardwood cuttings, budding, and grafting. However, the propagation method that we are steadily expanding is that of softwood cuttings. Today I wish to discuss softwood cutting propagation of oaks, magnolias, crabapples, and dogwoods. We have chosen to use the softwood cutting method because seeds are too variable, hardwood cuttings are too limiting, and budding and grafting are too expensive and time-consuming. We have found that softwood cutting propagation is not the answer for all trees. However, we do consider it an excellent method for many shade and flowering trees that have superior shape and fall color, characteristics that we want to maintain.

GENERAL PROCEDURES AND PRACTICES

It is important first to emphasize a few procedures and practices common to the softwood cutting propagation of the four genera of plants we are discussing. The cutting material is gathered in the early morning, between 7:00 and 10:00 a.m. and is immediately placed in wet burlap. It is then transported to the propagation area where it is placed on pallets under a specifically designated mist system.

When we are ready to prepare the cuttings for sticking, we remove the cutting material from the mist system and dip it into a solution of Benlate and Diazinon 4E (eight oz. Benlate plus one pint Diazinon 4E per 100 gal. water). The cutting material is then placed on a table where it is cut into specific cutting lengths, and sometimes wounded, depending upon the plant being prepared.

The cuttings are then dipped into a rooting hormone, using the concentration suitable for the particular plant. We have experimented with mixtures of naphthaleneacetic acid (potassium salt K-NAA) and indolebutyric acid (potassium salt K-IBA). However, we primarily use the K-IBA.

The final step is the same for all four plants; the oaks, magnolias, crabapples, and dogwoods. The cuttings are taken to the nursery's main mist system and rooting area. We use the Parasol nozzle by Spraying Systems and maintain the pressure of the nozzles at 80 to 100 psi.

The cuttings are then stuck $\frac{1}{2}$ to $\frac{3}{4}$ in. deep into a propagation mix consisting of 35% peat, 40% perlite, and 25% sand (6B gravel)

with five pounds Osmocote (18-6-12) and one pound Micromax per yd.³ We generally use Lerio 2¼-in. rose pots for rooting. However, we are currently testing some trays by "Tray Masters of Florida" because of their sloped sides and large openings in the bottom.

SPECIFIC PROCEDURES AND PRACTICES

After describing several general procedures used in softwood propagation, it is particularly important to discuss practices that are unique to each of these four plant genera.

Dogwood (*Cornus florida*). At Simpson Nurseries, we have taken dogwood cuttings throughout the summer months. However, our best results occur when the cuttings are taken in May or in late August. The cuttings are 3 to 4 in. long and are taken from hardened current season's growth. Early cuttings are quick-dipped in 1% K-IBA. Late cuttings are dipped in 1% K-IBA for 10 sec. It is preferable to have a node at the base of the cuttings, but it is not absolutely necessary. Callus appears in three to four weeks, with roots forming in six to eight weeks.

Crabapple (*Malus* 'Hopa', *M.* 'Almey,' *M.* × *eleyi*, *M. floribunda*). Crabapple cuttings are usually taken in July. We take 2 to 3 ft. shoots from the current year's growth, then cut them into 4-in. lengths. All the leaves are removed from 1-in. of the cutting, starting at the base. Two to three leaves are left at the top of the cutting. The tip is usually too soft to use. We use 0.5% K-IBA as a quick-dip. Callus appears in 2 to 3 weeks with roots forming in 4 to 6 weeks.

Magnolia (*Magnolia grandiflora*) Simpson Nurseries take *Magnolia grandiflora* cuttings from the current year's wood that has hardened off. The time period can range from June to August. The cuttings are taken from southern magnolia trees growing in the container area of the nursery. We select the trees with superior shape, growth, leaf size, and color. The final cuttings are approximately 4-in. long and have one or two whole leaves remaining on them. The bases of the cuttings are cut at a slant or wounded slightly. They are then dipped in 1% K-IBA. Callus appears in 3 to 4 weeks with roots appearing after 6 to 8 weeks.

Oaks (*Quercus virginiana*, *Q. shumardii*, *Q. laurifolia*) We have historically grown these three oak species from seed. However, because of variable growth and, in the case of the *Q. shumardii*, variable fall color, we have begun experimenting with the softwood method of propagation.

Cuttings from live oak and laurel oak are normally taken in July from the current year's hardened growth. The cuttings are 2 to 3 in. long and are usually tip cuttings. The thicker stems generally represent better cuttings. Since the leaves and stems are removed from the bottom inch, there is usually a wound, which can take up the K-

IBA. The bases are quick-dipped in 1.2% K-IBA. Callus appears in 4 to 5 weeks with rooting taking place in 7 to 9 weeks.

Cuttings from *Quercus shumardii* are taken in late July from the current year's growth and are 3 to 4 in. long. The wood is not as brittle nor as hard as the wood on the other oak species. We quick-dip the cuttings in 1% K-IBA. Callus appears in 4 to 5 weeks with rooting taking place in 7 to 9 weeks.

CONCLUSION

At Simpson Nurseries we have found softwood cutting propagation to be the preferable method for propagation of certain species of oak, magnolia, crabapple and dogwood. Because of the tremendous success we have experienced, we intend to expand our experimentation and utilization of the process. In our opinion, the potential and merit of softwood cutting propagation have been well documented and demonstrated.

TISSUE CULTURE OF OAKS AND REDBUDS

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Abstract. A micropropagation method for *Quercus shumardii* is described. Stem sections were utilized as explants and shoot multiplication was promoted with WPM amended with BA. BA and 2iP were tested in a range of 0.0 to 5.0 mg/liter with 2.0 mg/liter BA supporting optimal shoot growth. After 6 weeks shoots could be divided and subcultured on a combination of BA, IBA, and GA₃. Shoots were simultaneously rooted and acclimatized after a 15-minute dip in 500 ppm IBA. The methods presented required only minor refinements for the micropropagation of three other *Quercus* species and of *Cercis canadensis*.

REVIEW OF LITERATURE

The list of tissue-cultured woody perennials available to nurseries is increasing. Among these availabilities are: Amelanchier, apple, azalea, birch, blueberry, blackberry, dogwood, kiwifruit, Magnolia, Nandina, poplar, raspberry, *Raphiolepis*, *Rhododendron*, rose, and *Syringa*.

One problem with this list is that for many of the cultivars plants are only available one to two months of the year, and orders must be booked a year ahead. A second problem is that there are no oaks on the list. Oaks are a very highly valued tree, both as timber and as landscape plants.

Oaks are usually sexually propagated since clonal propagation has been limited (2,3,8). Seed propagation of oaks is plagued