

How Grafting Technique on *Aesculus* Can Influence Healing[®]

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GRAFTING METHODS

The technical goal of grafting is to unite a scion and rootstock as quickly as possible, using one of several methods that will produce a strong union with maximum cambial contact. I employ three types of carpentry when grafting *Aesculus*:

- 1) Cleft
- 2) Splice
- 3) Whip and tongue

Advantageous buds (i.e., suckers) often appear when healing is slow or incomplete. Though advantageous buds can and will be commonly produced around the union regardless of the technique, any style that leaves edges of cambium tissue exposed is more likely to do so. For this reason I prefer splice or whip and tongue more so than cleft grafting.

Each year Brotzman's Nursery grafts approximately 200 *A. ×carnea* cultivars and *A. ×arnoldiana* cultivars onto *A. hippocastanum*. I usually graft onto potted stock that has been warmed to induce root initiation. *Aesculus* respond well to heat and a hot callus pipe can be used. I have also plunged them in peat and stood plants upright in flats. Grafts are always secured with rubber bands and I usually use parafilm over the union, though wax is okay. The key is not to let the union or scion dehydrate. Healing is fairly rapid. Many times a lot of callus tissue is produced and care must be taken that it does not grow over the rubber band. Advantageous buds should be removed as soon as possible.

Splice Graft. When scions and understock are of similar diameter, each can be prepared with a long, flat sloping (approximately 60° to 70°) cut 1 to 2 inches long, making sure both cuts are equal size. Lay them together, matching cambiums as perfectly as possible. Advantageous buds can develop at any point after healing has started, but most often where cambiums do not knit smoothly.

Cleft Grafting. Typically this style is used when the scion and understock are not the same size. The scion is prepared on both sides with wedge-shaped cuts 1 to 1¼ inches long. A cut of corresponding length is made in the understock, making sure to keep to one side of the pith. The understock is cut off flat before the scion is inserted. Since cambial tissues can be matched on only one side, advantageous buds can arise on the open side, but most often occur on the flattened stub of the understock. The open side usually fills in with callus tissue and heals nicely.

Whip and Tongue. Scions and understock are prepared as for splice, but each piece receives one additional cut that runs parallel to (but not in) the pith. Cuts in the pith tend to split easily. When slid together the scion and understock are more secure than with a simple splice. Though more complicated to make, I like the finished appearance of the healed union. Advantageous buds are also less than with cleft grafting.

CONCLUSIONS

Many different grafting techniques can be used to propagate *Aesculus*, and all of them will produce strong, healthy unions. If one technique more than another produces incomplete healing or more advantageous buds, the propagator should work to perfect the process or utilize another method that produces better results.

Bernheim Arboretum and Research Forest; Eastern Region IPPS Tour Site for 2001[©]

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This poster presentation is designed to introduce I.P.P.S. members to Bernheim Arboretum and Research Forest. As a tour site for the 2001 meeting in Lexington, Kentucky, all members will have an opportunity to visit Bernheim and study the plant collections and facilities. This private, nonprofit institution covers over 15,000 acres of mostly forested Kentucky Knobs land. Plant collections cover primarily woody ornamentals, with over 8000 plants in current inventory. This presentation describes Bernheim's natural resource infrastructure and its research philosophy.

Bernheim Arboretum and Research Forest is a private, nonprofit organization located 20 miles south of Louisville, Kentucky in U.S.D.A. hardiness Zone 6b. This 15,000 acre facility contains approximately 400 acres of arboretum and other publicly accessible areas, 12,000 acres of mostly forested research forest, and over 35 miles of hiking trails. The arboretum's collections contain over 8000 plant specimens with significant collections of *Ilex*, *Acer*, *Viburnum*, *Magnolia*, *Malus*, *Hamamelis*, *Buddleja*, *Hydrangea*, and *Aesculus*. Most of the arboretum's collections have been amassed over the last 40 years. In addition to the woody ornamental plant research, Bernheim maintains an active natural areas program concentrating on natural systems restoration and management.

Bernheim's woody ornamental plant collections are arranged in a roughly taxonomic placement facilitating comparison and study. The soils are primarily clay loam of several designations, with pH typically between 6.6 and 7.0. The record low temperature is -24°F however 0°F to -5°F is most typical for winter low temperature.

One of the major goals of Bernheim's horticultural research program is to conduct rigorous performance evaluation studies on a wide range of local and introduced plants in order to identify those with the greatest potential for success in landscape situations. To insure that Bernheim's plant recommendations are adequately supported, rigorous performance evaluation studies will be conducted. These studies will employ appropriately replicated, scientific study of such features as; cold tolerance, insect and disease susceptibility, growth rate, propagation potential, and potential invasiveness. In addition, ornamental characteristics to be evaluated include summer