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Propagation of Deciduous Azaleas[®]

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INTRODUCTION

There are 15 deciduous azalea species native to the Eastern United States, but they are relatively rare in our gardens. In 1791, plant explorer William Bartram said of *Rhododendron calendulaceum*, the Flame Azalea (Fig. 1), "This is certainly the most gay and brilliant flowering shrub yet known." (Slaughter, 1996). Our native azaleas have been greatly admired for hundreds of years, but partially due to propagation difficulties, these species are still not widely available in the trade.

Native deciduous azaleas come in a wide range of colors, and many are delightfully fragrant. Species bloom at various times of year, from early spring to late summer. Most native azaleas are not bothered by mildew, a major problem with the deciduous Knap Hill and Exbury azalea hybrids. Adapted to local environments, native azaleas require less care than many garden shrubs. Their delicate flowers, which usually bloom over a long time period, are also less susceptible to weather. Many plants have very attractive foliage. Unfortunately, due to loss of habitat, theft, deer browsing, and competition from invasive alien species, many wild azaleas are threatened.

EAST COAST NATIVE AZALEA SPECIES

Native azaleas are quite variable, and rare forms still exist in the wild that should be preserved and propagated. Some species are better suited to southeastern gardens, but the author briefly comments about all 15 native species, grouping them by color and order of bloom (Kron, 1993).



Figure 1. Picture of flame azalea in flower.

White Group.

Rhododendron alabamense – White with a yellow blotch; fragrant; sometimes difficult in containers.

Rhododendron atlanticum – White to pale pink; very fragrant with attractive blue-green foliage.

Rhododendron eastmanii – First identified as a species in 1995; flowers white with a yellow blotch.

Rhododendron arborescens – Very fragrant; white with red stamens; excellent heat tolerance, and roots fairly easily.

Rhododendron viscosum [Includes the *R. serrulatum* (see *viscosum*), *R. oblongifolium* (see *viscosum*), and *R. coryanum* (syn. *coryi*)] – Fragrant white flowers.

Pink Group.

Rhododendron vaseyi – Delicate pink to white flowers; adaptable plant but often difficult to root.

Rhododendron canadense (formerly *R. rhodora*) – Small purple flowers; does not like heat or drought.

Rhododendron canescens – Pink to white; mildly fragrant; good heat tolerance.

Rhododendron perclymenoides (formerly *R. nudiflorum*) – Similar to *R. canescens* but more difficult to root.

Rhododendron prinophyllum (formerly *R. roseum*) – Deep pink; fragrant; not very heat tolerant.

Orange Group.

Rhododendron austrinum – Yellow to gold; fragrant; heat tolerant and excellent in the southeast.

Rhododendron flammeum (formerly *R. speciosum*) – Yellow, orange, or red; heat tolerant; hard to root.

Rhododendron calendulaceum – Yellow, orange, or red; not as heat tolerant and often difficult to root.

Rhododendron cumberlandense – Similar to *R. calendulaceum*, but blooms slightly later; difficult to root.

Rhododendron prunifolium – Red to coral; blooms in mid- to late summer; heat tolerant; easy to root.

Natural Hybrids.

Gregory Bald Azaleas – Blends of white, yellow, pink, orange, and red; blooms in June.

CUTTING PROPAGATION

Stem cuttings are often preferred for vegetative propagation, but rooting deciduous azaleas can often be problematic. One major difficulty is that after cuttings root, they often refuse to break dormancy the following year. Since the plants drop their

leaves in the fall, cuttings with dormancy problems fail to send out new growth the next spring and eventually die.

Timing is the key to success when taking deciduous azalea cuttings. The best time is late May to early June while in active growth. By taking cuttings early, there is often adequate time to form roots and to send out additional growth before autumn. Plants begin going into dormancy when the days get shorter and nights turn cool. Some propagators force plants into growth in late winter so cuttings can be taken even earlier, thus increasing the chance of success.

The author suggests the following procedure for rooting deciduous azalea cuttings on a modest scale. He roots his cuttings under fluorescent lights in containers enclosed in plastic bags.

Procedure.

- **Cutting Selection.** Preferred cutting material is strong new growth that is getting firm, but is not hardened-off. Cuttings need not be very long; segments of 5 to 8 cm (2 to 3 inches) are ample.
- **Preparation.** Pinch out soft new growth and any developing flower buds. Remove lower leaves. To eliminate insects and fungal spores that could eventually cause problems, soak cuttings in a 5% Clorox solution for about 5 min and then rinse thoroughly. Cuttings can also be sprayed with a systemic insecticide/ fungicide mixture (Isotox / Funginex).
- **Auxins.** Dip the end of the cutting in a rooting hormone like Dip 'N Grow[®]. The strength should be relatively low, 1 part hormone to 10 parts water. Some propagators suspect that higher hormone concentrations may inhibit cuttings from breaking dormancy. Some growers are successful without using any rooting hormone at all.
- **Rooting Medium.** Stick cuttings in a rooting medium of equal parts peat and perlite. The medium should be damp but not too wet. Azaleas are shallow rooted so cuttings do not need to be inserted deeply, only the bottom inch or so, up to the first leaf on the cutting.
- **Care.** Enclose containers in clear plastic bags to maintain high humidity. Keep containers under fluorescent lights with "long-day" conditions, 18 to 24 h of light per day, to maintain vegetative state for at least 8 weeks, or until cuttings root. Since plants are used to high humidity, before removing the plastic, open bags slowly over several days to gradually harden plants off. Otherwise leaves wilt very quickly, since they are unable to adjust to abrupt change.
- **Dormancy Concerns.** Rooted cuttings that have sent out a flush of new growth can be moved to a cool greenhouse or cold frame in the fall to go through the normal dormancy process. Cuttings that did not break are best kept under fluorescent lights until spring to avoid dormancy problems. The author prefers to wait until early spring before repotting cuttings.
- **Growing Medium.** For cuttings or young plants, peat and perlite (1 : 1, v/v) is suggested; sometimes mixed with a bit of coarse sand. In larger pot sizes, excellent drainage is important so the author

uses a mix of equal parts of the peat and perlite rooting medium used for cuttings, combined with an equal amount of pine bark fines. Some growers prefer 100% pine bark fines for larger containers, especially when growing in full sun with heavy irrigation.

- **Potting.** Pot sizes of 8 to 11 cm (3 to 4.5 inches) are usually adequate for the first season. Transplant to 4- or 11-L (1- or 3-gal) pots the following year, and pinch or shear back early to encourage branching. Grow in full sun for best bud set. Plants can reach marketable size in 1 to 2 more years.
- **Care.** Plants appreciate ample water, but the amount of fertilizer deciduous azaleas need is related to light intensity. The stronger the sun, the more fertilizer plants can tolerate. Beware of high fertilizer with low light intensity, since it encourages disease problems. The author uses Nutricote Total, Slow Release 13N–13P–13K with micronutrients-Type 100, applied in spring after blooming. Supplement with dilute liquid fertilizer such as Schultz 15N–30P–15K, as cuttings leaf-out in spring, and as needed through the season. Avoid fertilizer late in the summer, since plants must go dormant before winter so as to avoid bark split and related winter injury. Since plants are deciduous, they can be overwintered with minimal protection if pots are clustered together and mulched well to protect root systems. Root systems are not as hardy as stems, so pots should not be allowed to freeze too hard, even with mature plants.

SEED PROPAGATION

Raising plants from seed is an excellent method for propagating native azaleas, especially for those species that are difficult to propagate by other methods. A single seedpod can have a hundred or more seeds, so a large number of plants can be raised from limited stock. In the wild, few seedlings make it to maturity because tiny plants are susceptible to drought and competition. However, once past that first year, plants are more adaptable to extremes. Seed-grown plants will show genetic diversity, but almost every one will make an attractive landscape plant.

During the late fall or winter, sow seed indoors thinly on the surface of peat and perlite potting medium, the same mix used for cutting propagation. Enclose containers in clear plastic bags and place them under fluorescent lights with long day conditions at 15.6 °C (60°F). Seedlings germinate in a few weeks, but grow slowly at first. Crowded seedlings can be transplanted to fresh medium when they show their first true leaves. Never let small seedlings dry out, for if that happens once, they usually die. Keep seedlings growing inside clear plastic bags until spring.

As with cuttings, allow seedlings to harden off by gradually opening the plastic bags over several days before moving them outside. Get seedlings used to increased light levels and then transplant to individual pots, 6 to 8 cm (2.5 to 3 inches) in diameter depending upon seedling size. Avoid over-potting. Eventually move to moderate light, 30% to 50% shade cloth for at least the first season. Pinch plants or prune back to encourage branching. The next year, move plants up to 11-cm or 4-L (4.5-inch or 1-gal) containers and eventually to a 11-L (3-gal) size. At that time, they should be grown in full sun, with ample fertilizer and regular irrigation to encour-

age bud set. Under good growing conditions, a well-budded landscape plant can be produced from seed in about 3 years.

There are various approaches for seed-grown deciduous azaleas. The former Arneson Nursery in Canby, Oregon, U.S.A., developed crosses that produced deciduous azalea hybrids that were quite uniform in color and plant habit. Vivian Abney of East Fork Nursery, Sevierville, Tennessee, U.S.A., raises many native azalea species from the wild, and each plant is labeled with the seed source. At the Tennessee Rose Nursery in Trade, Tennessee, J. Jackson and wife, Lindy Johnson, raise open-pollinated descendents of the "Zo" hybrids. These are multicolored native azaleas similar to June-flowering Gregory Bald hybrids, using stock plants from late Ohio nurseryman, Zophar Warner. The Lazy K Nursery of Pine Mountain, Georgia, U.S.A., is famous for its seed-grown natives, especially *R. prunifolium*.

OTHER PROPAGATION TECHNIQUES

- **Dormant Cuttings.** Mike Creel, retired extension agent from Lexington, South Carolina, is having success rooting dormant cuttings of deciduous azaleas. Woody twigs, preferably with branched segments, are placed under clear plastic domes. These domes remain outside in open shade, and cuttings are allowed to go through normal cold treatments. As the woody cuttings break dormancy, they send out new growth while forming roots at the same time. The plants started from dormant cuttings apparently avoid dormancy problems common with cuttings taken in early summer. Mike does not use any auxins for rooting.
- **Basal Shoot Cuttings.** Many deciduous azaleas are stoloniferous, so Allen Cantrell of Fern Gully Nursery, Chesnee, South Carolina, has been propagating plants by taking a portion of a shoot or root from the base of a mature plant. Segments are potted up and kept in a humid, shady area. Roots form below ground level, and adventitious buds break above where exposed to light.
- **Micropropagation.** Tissue culture has become one of the best methods for rapidly increasing cloned forms of deciduous azaleas (Briggs et al., 1988). The first stage is to isolate plant tissue in a sterile culture medium. Various chemicals are used to get shoots to elongate, after which they are cut into segments and rooted. After rooting, care is essentially the same as with raising small seedling plants. Through Virginia's Beautiful Gardens^{III} program, Barry Flinn and Rumen Conev, Institute for Sustainable and Renewable Resources at IALR, Danville, Virginia, are experimenting with tissue culture protocols using some of the author's native azalea selections. We hope to make quantities of those plants available in the future.

CONCLUSIONS

Our native deciduous azaleas of the Southeastern U.S. make excellent landscape plants and deserve wider distribution. Selected clones can be propagated by methods such as softwood cuttings, dormant cuttings, and basal shoot cuttings. Most of the difficulty related to vegetative propagation centers around dormancy problems where cuttings root but fail to grow. In vitro tissue culture propagation is proving to be a valuable method for rapid increase of cloned forms. Quality plants can also be raised from seed to blooming size in a few years with relative ease.

LITERATURE CITED

- Briggs, B.A., S.M. McCulloch, and L.A. Edick.** 1988. Micropropagation of azaleas using thidiazuron, pp. 205–208. In: von Henting, W-U and G. Grüber (Eds.). Intl. Symp. Prop. Ornamental Plants. Acta Hort. 226.
- Davidian, H.H.** 1995. Rhododendron species. Vol. IV Azaleas, Timber Press, Portland, Oreg.
- Galle, F.C.** 1985. Azaleas. Timber Press, Portland, Oregon.
- Kron, K.A.** 1993. A revision of Rhododendron section Pentanthera. Edinb. J. Bot. 50(3):249–364.
- Slaughter, T.P.** (Ed.). 1996. William Bartram: Travels and other writings. The Library of America, Penguin Books, New York, New York.
- Towe, L.C.** 2004. American azaleas, Timber Press, Portland, Oregon.