Setting New Roots in an Old Tradition

Dr. Anthony V. LeBude
Nursery Extension Specialist
NC State University
Mountain Horticultural Crops
Research and Extension Center

Jeff Jones
Former Graduate Assistant in the
Department of Horticullutral
Science, NC State University

Dr. Thomas G. Ranney
Professor, Department of
Horticultural Science, North
Carolina State University

Brian Upchurch, and
Owner, Highland Creek Nursery,
Fletcher, NC

Joe L. Conner
Research Specialist, Mountain
Horticultural Crops Research &
Extension Center

In the mountains of western North Carolina, many folks are blessed with good agricultural land but lack resources to develop that land for ornamental plant production. When recent complications with the economy are combined with baby boomers nearing retirement, many folks in the area are looking to produce ornamental plants as either a side project or an outright change of employment to entrepreneurship. Even though many current nurserymen and growers might argue that the market is already saturated with nurseries and plant material right now, that does not seem to stop people from inquiring about the process or dampen their determination to succeed.

The nursery business, and for that matter horticulture in general, is grounded in plant propagation, whether by seeds, stem cuttings, grafting or tissue culture. Propagation is simply the easiest way to get started in the nursery business and allows for the least amount of initial capital while incurring a low risk. Moreover, plant material, if sold as liners, can produce an income within a year depending on the species. Think of any plant in the nursery industry that is produced and sold on a wide scale, and it probably roots well from stem cuttings collected at any time of the year; it also helps if the plants grow well in production, transplant easily to the landscape, and live without much care once established. Examples include ***Ligustrum*** sp., 'Green Giant' arborvitae, multitudes of hydrangea cultivars, and evergreen azaleas. Alternatively, some species in the trade are propagated more readily by other methods such as grafting, which incur higher production costs, but can drive down availability and raise the price for some species according to market demand. One example of a difficult and perhaps expensive plant is the native mountain Stewartia (***Stewartia ovata***), whose seeds have a complicated double dormancy, and whose stem cuttings might root at average percentages at only one time per year, only to die the following spring after overwintering. In production, plants are susceptible to ***Phytophthora*** root rot, as well as other soil born pathogens, and plants die quickly in the average landscape. One person noted that ***Stewartia*** only thrive in power point presentations, where their summer blooms can be heralded as the epitome of fine gardening. The plant is extraordinary, but it is difficult to find and grow successfully.

Native deciduous azaleas have always been in short supply due in part to inconsistent availability from many nurseries, cyclic exposure by garden writers uncoupled with availability of plants, and for some species, the unfortunate habit of flowering after Mother's Day weekend. There is no shortage of diverse, desirable cultivars, and large sizes of field-grown plants are sought after by local landscapers, landscape architects from the northeast, and other growers in North Carolina and surrounding states. Folks in the mountains have easy access to a wide range of native plant material with an enormous supply available of seeds or other propagative material (legal issues regarding collecting from the wild apply). Without much

technology, one method to propagate these plants is through mound layering.

Mound layering, or stooling, is a method of in-field vegetative propagation, drawing upon the principles of serial pruning and etiolation to encourage adventitious root formation. Stock plants grown in the ground are hedged annually and the bases of emerging shoots are covered with pine bark or another substrate providing a suitable environment for root formation. Subsequent roots grow into the surrounding substrate and rooted stems (layers) can then be severed from the stock plant. Annual hedging aids in the maintenance of vegetative, juvenile growth, which maintains a greater capacity to form roots than older more mature plant material. This form of propagation is a viable option for difficult-to-root plants, not to mention easy to root plants, and is utilized extensively with temperate fruit trees. Mound layering has the added advantage of requiring minimal facilities, and the technique can lend itself to mechanization in field situations. Upright growth habit and the ability to produce many new shoots following pruning are characteristics of plants that could be propagated successfully by mound layering.

Recent trials mounding stock plants of Oconee azalea (*Rhododendron flammeum*), Florida flame azalea (*Rhododendron austrinum*) and bottle brush buckeye (*Aesculus parviflora*) have been quite successful. Large 15-18 inches tall plant material grown from seeds were planted in fall 2005 and allowed to grow overwinter. In late winter 2006, plants were hedged to 6" above the ground and some were covered immediately with non-amended pine bark (Figure 1 on page 28). Other plants were allowed to leaf out and those were mounded in June. Before June mounding, plants were either not wounded or wounded by using a grafting knife to scrape a 2 inch length of bark off in a vertical direction. Additionally, a 5,000 ppm solution of the potassium salt of indole butyric acid (K-IBA) was sprayed, or not sprayed, on the stems. These methods were used to determine if wounding or the addition of K-IBA to plants might increase the formation of roots into the mounds. All plants were then mounded with about 15-18 inches of aged, non-amended pine bark (Figure 1). Plants were irrigated about one inch per week through the summer to keep the pine bark moist and allowed to grow until the

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following late winter. Mounds were dug in late winter 2007 and the experiment was repeated again for another year.

After each year, plants of all species produced about 6 rooted layers per mound. These rooted layers had variably sized root systems (Figure 1); therefore, some of the plants could easily be replanted as either liners in containers or a field, or replanted in a prepared field bed to establish more size before being field-planted later. Of course, the mound or mother plant remained in the planted bed for mounding again. Thus, the process is continual.

Figure 1. Mounding native rhododendrons. Clockwise from top left. Cuttings stock plants to 6 inches. March mounded plants using a 24 inch high x 24 inch wide wire basket filled with non-amended aged pine bark. In June, wounding stems with a grafting knife by slicing a small piece of bark off about 2 inches long. Also in June, spraying stems with potassium salt of indole butyric acid (K-IBA) prior to mounding. A representative picture of both the March mounded plants after stems grew through the bark, or a June mounded plant right after mounding. Mound removed the following March to show rooted layers of bottle brush buckeye. Mound removed the following March to show rooted layers of Florida flame azalea. Average sizes and quality of azalea rooted layers.

It did not matter when the plants were mounded or if they were wounded or sprayed with K-IBA. March mounded plants were the same size as June mounded plants and the addition of wounding or K-IBA did not improve the root systems considerably, at least not significantly enough to warrant those practices in a production setting.

For production, stock plants could be planted on 2 foot centers in a field bed, cut back yearly and mounded using a manure spreader or similar device to decrease production labor inputs. Irrigation to keep the pine bark moist around the mounds is necessary. Both drip and overhead irrigation would work. This low-tech approach to producing saleable plants can allow new nurserymen and growers to produce some plants easily while they concentrate on honing the more difficult production systems which require more skill and capital to be successful. Planting and propagating desirable cultivars, instead of seedlings, would provide an added market value to finished plants.

This work was partially funded by the North Carolina Nursery and Landscape Association and the Southeast Chapter of the American Rhododendron Society.