

Magnolia Propagation at Arcola Creek Nursery

Victor Swanson

Arcola Creek Nursery, 2452 Dock Road, Madison, Ohio 44057 U.S.A.

INTRODUCTION

I begin my presentation with a quote from the last I.P.P.S. newsletter written by this year's program chairman, Mr. Tim Brotzman, who also happens to be a good friend and neighbor. In his comments regarding this year's program, he wrote, and I quote, "Fundamentally, propagators (and nursery operators) have been inventive, practical, and blessed with keen powers of observation, skills that become well honed by time and experience." After considerable thought, I concluded that "yes", I can relate to that.

Tim's quote brought a remembrance of one of my first experiences in the nursery industry which involved the calibrating and mixing of water soluble fertilizer. Upon completion of my task, my employer, a highly respected nurseryman and plantsman of that day, and I believe a charter member of this organization, carefully inspected my work by a rather unusual method of scrutiny. For his final approval, he reached down, cupped his hands in the tank of fertilizer and slowly raised his hands toward his face! As he proceeded, I said to myself, "Oh no! He's going to drink it!" Fortunately, he was just sniffing it, but much was learned through that episode. I soon learned that time, experience, observation, and a natural feel for plants are truly key factors to success in this business. I have always approached propagation and growing from a common sense point of view rather than a scientific viewpoint, and have carried that philosophy since 1982 when we began to build our nursery.

So, with those thoughts in mind, I introduce you to Arcola Creek Nursery. We are a small wholesale operation of 25 acres located in Lake County, Ohio, more specifically, Madison Township, about 50 miles east of Cleveland along the shores of Lake Erie. The heavy concentration of nurseries in this area is largely attributed to the moderate climate conditions, natural water supply, moisture, drainage, and other protective factors due to the proximity of Lake Erie. Our main focus is field production of high-demand, somewhat unusual flowering trees and shrubs, for the landscape and retail use. Although balled and burlapped material is 75% of our annual income we also sell bareroot hostas and daylilies, and do custom propagation in the form of rooted cuttings, bareroot liners, and seedlings. We propagate over 90% of the plant material that eventually goes to the field to be finished off. Liners are purchased only when we want to try something new, or when there is a crop failure. Our annual production constitutes approximately 40,000 softwood and semihardwood cuttings, 1000 grafted pieces, and 20,000 seedlings along with bareroot perennial divisions. One may conclude from these figures that we are definitely a "mom and pop" operation!

People inside and outside the trade often ask how I decide what to grow in the nursery. Personal preference is always a consideration but more importantly is the quality and diversity of the sandy loam soils that help make the decision.

One item that performs very well in our soil is some taxa of magnolia (Table 1). It just so happens that magnolias are also a favorite of mine!

Table 1. Magnolias propagated at Arcola Creek Nursery.

<i>Magnolia</i> (<i>M. liliiflora</i> 'Nigra' × <i>M. stellata</i> 'Rosea') 'Betty', 'Ricki', and 'Susan'
<i>Magnolia</i> (<i>M. acuminata</i> × <i>M. denudata</i>) 'Butterflies' PP #7456 (grafted)
<i>Magnolia</i> × <i>loebneri</i> (<i>M. kobus</i> × <i>M. stellata</i>) 'Ballerina', 'Leonard Messel', and 'Merrill'
<i>Magnolia</i> × <i>soulangiana</i>) 'Alexandrina'
<i>Magnolia stellata</i> 'Centennial', 'Royal Star', and 'Waterlily'
<i>Magnolia virginiana</i> glaucous form (seedling grown)

METHOD AND MATERIALS

The majority of our magnolia plants are rooted from softwood cuttings which are processed and stuck beginning around June 15th. I cannot emphasize enough the importance of timing in the rooting of softwood cuttings. Many cultural aspects and techniques such as hormone treatment aid in the process, but it is my personal opinion that none is more important than the condition and quality of the cutting itself. As a television commercial once stated, "timing is everything!" Considering all of the summer activities that are done throughout the nursery, none of them is of higher priority than propagation! For us, magnolias are normally the first plants we propagate due to their overall difficulty and short window of success time.

When we first started propagating magnolias, we took "heel" cuttings. However, having a field production operation, the demands of planting and harvesting made it difficult to get heel cuttings in a timely manner. In other words, we had high incidences of crop failure! Through observation and experimenting, we have found that cuttings made from lateral shoots taken from juvenile plants 3 to 4 years in age, have consistently higher rooting percentages than heel cuttings taken too late, or those cuttings taken from vigorous strong terminal shoots. Cuttings are quickly brought in from the field and washed in a large tub of water to cleanse from any pesticide residues, sand, and pests as well as to maintain turgidity. During the process of preparing the cutting, I have found a basal wound to be very beneficial in the overall success and production of root primordia. This is due to an accumulation of hormones and carbohydrates in the wounded area and also an increase in respiration. Wounded cuttings are also able to absorb growth regulators and more water from the rooting medium, thus promoting callus production and eventually root initiation. We also clip the leaves to reduce transpiration, as well as to provide increased air circulation, thus cutting down on potential fungal problems.

After wounding, the cuttings are first dipped into Hormo Root, a talcum-powder-based indolebutyric acid product of 2% strength. Due to the overall difficulty of magnolias, we have found 2% to be the most effective with very little burning.

The cuttings are then stuck in Christie Nursery polyflats which are 18 inches long × 15 inches wide, and 3½ inches deep. Each flat will contain approximately 100 cuttings. Our growing medium consists of Canadian peat moss, coarse perlite, and coarse concrete silica sand (5 : 5 : 2, by volume). This recipe has proven to provide

excellent drainage and porosity. We use this same ratio for most everything we propagate including *Rhododendron* and *Daphne*.

The filled flats are placed in our propagation polyhouse which measures 22 ft × 48 ft. The climate in the greenhouse is easily maintained due to its compact size. Intermittent mist nurtures the cuttings until root initials form which takes from 3 to 6 weeks. Rooting time varies among taxa. The National Arboretum's "girls" selections being first, followed by the *M. stellata* or star-type magnolias, and finally the *L. × loebneri* cultivars. Periodic checks of the bottoms of the flats helps determine the progress of root activity.

When sufficient roots are seen, the flats are moved from the mist house to a hardening off house that is covered with 47% shade cloth. Occasional misting is done by hand until the plants have acclimatized to the new environment.

Magnolias, along with all other tender crops, are overwintered in our minimum heat polyhouses which are maintained at a temperature of 38 to 40F. The following spring, plants are removed from the flats, root pruned, and planted in liner beds and grown for 2 years. The reason for the liner beds is threefold: (1) Growing in a confined area rich with organic matter, including composted ryegrass and composted leaves, provides nutrients to help the rooted cuttings push growth quickly; (2) plants in beds are easy to maintain with regard to weeding, fertilizing, and watering; (3) beds act as a quality control measure from which we can select the most vigorous plants to be grown on to finished B&B stock.

Magnolia virginiana or sweetbay magnolia has been propagated somewhat successfully by cuttings in the trade. However, at our nursery we prefer to grow them from seed because we usually have an abundant supply of seeds and have experienced a high percentage of germination. We are also able to sow the seeds outdoors rather than taking valuable greenhouse space.

Seed is collected during the month of September primarily from our own field stock. The seed is then picked from the follicles and the pulp removed from the seed using screens. Cleaned seed is then placed in plastic bags along with moist sand to prevent desiccation, and placed in the refrigerator until it is time to sow.

Proper seedbed preparation is critical to the overall success of the seedlings. Composted leaves and Michigan peat are spread and incorporated into the natural soil to create a rich sandy loam soil. The site is next fumigated with methyl-bromide canisters placed under a sealed clear poly tarp, and then punctured, thus sterilizing the top few inches of soil. Normally the site is fumigated for 48 h followed by a minimum of 14 days of airing before the seeds are sown. Planting of seeds usually takes place in October or November. The actual procedure we use to plant the seeds is quite antiquated, but very effective in saving valuable space. Furrows are made by gently hammering 1 inch × 4-inch boards in the soft tilled soil. After the furrows are made, the seeds are dropped by hand into the furrows and covered with soil. Salt hay is thickly spread over the seed bed area; it aids in keeping the soil moist and weed free.

Germination takes place the following spring, generally around the end of April or early May. With the emergence of the hypocotyl and the first "true" leaves, the salt hay is largely removed to provide only a thin covering and shade is provided by means of a snow fence up on raised blocks and pipes. Although the germination percentage is normally high, the growth of the seedlings during the 1st year is minimal. During spring of the 2nd year, the sweetbays are undercut, pulled, root

pruned, and transplanted in a regular 6-row, liner-bed configuration. At their new location, they are pruned, fertilized, and nurtured for 2 years to establish heavier branching and fibrous roots. Much development takes place during this stage. Plants can attain a height of 30 inches which is desirable for field planting. The 3-year-old plants are once again undercut, root and top pruned before being hand planted in 4-ft nursery rows, and grown to finished sizes for harvest.

At Arcola Creek Nursery, we are very excited to have the growing rights for *M. 'Butterflies'*, a wonderful hybridized creation of Phil Savage. 'Butterflies' showcases large deep yellow flowers. Currently we are in our 3rd year of propagation, exclusively by grafting. All understocks are potted in tree bands 1 year before grafting is done. It is grafted in February on *M. kobus* using a side-veneer graft. The graft is secured by a rubber band and sealed water tight with ParafilmTM wrapped around the union. The versatility of this laboratory film eliminates the need for bench grafting tents. The finished graft is set upright in flats which are placed on top of sand beds in the greenhouse. Bio-therm hot water bottom heat helps to activate roots and stimulate the cambium tissues, thus promoting callus. As with the other magnolias, the newly formed grafts are planted in May into liner beds for 2 years. We choose to cut the rubber bands and ParafilmTM from the union prior to planting, although it is not imperative as the rubber band eventually rots and the growth of the union breaks the ParafilmTM. Periodic sucker removal from the understock helps keep all the energy directed to the scion. This year we planted our first field crop and hope to add 'Butterflies' to our catalog in the near future. Stay tuned.

CONCLUSION

Magnolias are a never-ending challenge. Have I master the art of propagating them? Hardly! I have found it to be one of the most humbling experiences in my life. We are who we are by what we learn. The keen power of observation and experience can only be achieved if it is modeled and taught to us. Many times as I look out over the fields from the second floor balcony of my home I am reminded of the people who took the time to teach me the skills I needed to know to learn the industry. To Zophar Warner, Ed Losely, John Ravestein, and Tim Brotzman, this Society, and a host of other folks, I will forever be grateful.

LITERATURE CITED

- Dirr, M.** 1983 Manual of woody landscape plants, 3rd edition. Stipes Publishing Company, Champaign, Illinois.
- Hartmann, H. and D. Kester.** 1968 Plant Propagation, principles and practices. 2nd ed. Prentice Hall, Englewood Cliffs, New Jersey