

Propagating Magnolias in Tennessee

Terry Pennington

We are located in the gentle rolling Highland Rim of middle Tennessee in zone 6. The southeastern third of Warren county is in the Cumberland Mountains. Our elevation ranges from less than 800ft (244m) (along the Caney Fork River, to about 2,000ft (610m) at the top of the Cumberland Mountains. Our soils are light-colored, silt on the gentle rolling areas with clay and cherty soils on the steeper hillsides. Our average temperature in January is 40 °F (4 °C) degrees with the average temperature of July being at 77 °F (22 °C). On average, our last killing frost in the spring is April 12 and the first killing frost in the fall is October 24. The growing season is around 195 days and the average annual rainfall is 51in (129.5cm).

I have lived and worked in McMinnville, Tennessee (known as the Nursery Capital) for 54 years. We have a nursery where we grow shade and ornamental trees as our source of income. We have grown the common magnolias for many years, but they all have so many problems that we have never recommended them. We grew them because there was such a demand for their beautiful blooms.

Propagating, cultivating, and evaluating the new superior hybrid magnolias has been our main objective since 1990, and when we first heard about the new magnolias that had been crossed with *Magnolia acuminata*, it rang a bell. We knew that the magnolia situation was about to change for the better.

At that time, taking cuttings was the usual method of propagating magnolias in our area—none of the old nurseryman had heard of budding them. Thus, we ordered a few of the new yellow magnolia hybrids from a tissue culture nursery to use as a rooted cutting block. To my surprise, the new growth rooted well the first year. However, the second year, the new growth callused and produced only a few roots, and the third year was a complete failure. That experience taught us that some of the difficult-to-root varieties *will* root if the new growth is very juvenile. We also rooted some one-year-old seedlings of various difficult-to-root varieties and found that they needed to be as juvenile as the tissue-cultured plants.

That first year, we had about a 90% survival rate after lining out the one-year-old cuttings in the field, spaced to ball. Some varieties grew about six inches the first year and some only grew about three inches. Because of the difficulty in rooting and the slow growth in the field, growing these difficult magnolias from cuttings is not be the choice method of propagation.

We next looked to propagation by budding to a faster growing rootstock. We then found another problem. Practically nobody grows magnolia seedlings. Where would we get the seedling rootstocks?

We tried to find *M. acuminata* trees to gather seed from. Although *M. acuminata* is a native tree in our area, there is a problem in finding enough seed. The trees bloom well, but do not bear much seed and when we gathered the few seed that were produced, most all floated. We checked some of the floating seed and found and they all had a hollow cavity next to the endosperm. We assumed that the endosperm is not to full capacity, because of dry weather that year. Although the floating seed might germinate, it would be too weak to grow into a good seedling. The seeds that sank to the bottom were in good shape and would probably have germinated. Needless to say, we failed to gather enough viable seed from the local trees.

We then turned to seed companies for a seed source and found that they had only dried seed. We ordered 10 pounds of dried *M. acuminata* seed, stratified it, and planted it out in the spring. Only about 5% of the seeds germinated. Back to the drawing board.

We searched the literature (going back 20 years!) and found that the seeds were worthless because *M. acuminata* loses viability when dried. We contacted the seed company and explained the problem to them, and they agreed to start a new seed-cleaning program. They cleaned the seed as soon as they received it, placed it into a moist medium, and then put it in the cooler at a temperature of 36 to 40 °F (2 to 4 °C).

The following year, we received the first batch of this seed from the seed company. We put the seed in a moist medium and placed the seed bags in the cooler. The next spring, we sowed the seed in prepared seedbeds; it came up about three weeks after planting. The seedlings grew to about 10 to 18 inches (25 to 46 cm) the first summer. We took them up that fall and lined them out spaced to ball, about 24 to 28in (61 to 71cm) apart.

The following growing season, we discovered another problem: *M. acuminata* does not grow well the first year after transplanting. So, we did not bud them that first year.

The second year, the seedlings took off growing and actually reached a one-inch caliper. We dormant-budded them in August using the chip-bud method. We cut the seedlings back to the bud the following March. When the buds put out, we found that they had to have bud guides so they wouldn't form a dogleg at the base of their growth (see Photograph 1). Out of 45 varieties budded in this manner, *M. 'Golden Glow'* was the variety most likely to produce a dogleg. They definitely must be guided, or the bud will grow out sideways about 4 inches (10cm) before starting to grow upward. (This reminds me of budding Bradford Pear back in the 70s when bud guides were developed.)

The new bud grew into a tree of 8ft (2.4m) the first year without having to be staked. We were afraid that the wind would break the tree off at the graft union, but this did not happen. They grew straight without stakes and did not break from the wind. This block of trees consisted of 800 seedlings, and we lost only 42 of them. The bud take was 92%, which we thought was an excellent stick. We budded 32 of the new yellow hybrids to the *M. acuminata* rootstock and all were very compatible. So, although *M. acuminata* turns out to be a good rootstock, you do have to wait two years to bud it.

Because the *M. acuminata* rootstock takes two years to establish enough to bud, we looked to another species to use as a rootstock. We found a source of *Magnolia kobus* seed and ordered 10 lb. of cleaned seed. We put



Photograph 1. One of a block of 'Butterflies' dormant budded and put out in the spring after being cut off above the bud on March 1st.



Photograph 2. Balled in the field and ready for shipment.



Terry Pennington

Photograph 3. Shipping an order of balled and burlaped trees to a garden center customer.

them through the same process as described earlier for the *M. acuminata*.

They all grew at the same rate in the seedbeds, so we lined them out that fall the same as we did for the *M. acuminata* two years earlier. The *M. kobus* seedlings transplanted well and grew fast enough to be budded the first year. Although we gained a year on budding with the *M. kobus*, they did not grow as fast in the second year after being cut back as did the budded *M. acuminata*.

I would recommend using either *M. kobus* or *M. acuminata* as rootstocks for just about any

variety of magnolia. However, keep in mind that magnolias need to be watered well the first year to become established. Also, they will have to be watered the year that they are budded. They are rather unforgiving about this requirement—in 1999 we budded about 3000 trees in August and lost almost all of the buds because of the dry weather that year. However, once these two rootstocks are established, they can stand up to any other tree with regard to livability in transplanting, being balled and burlaped, and becoming established. (See Photographs 2 and 3.)

We have grown and evaluated over 200 magnolia hybrids and species for the last ten years. We have already selected eight magnolias that have passed the endurance test. These magnolias have been tested for the following qualities.

- hardiness in the cold zones
- blooming late enough to avoid frost damage to the blooms
- upright and a good tree form
- blooming before leafing (precocious)
- flower substance and color
- good growth rate
- blooming at an early age
- resistance to canker on the trunks
- tree bark does not split in winter temperature fluctuations

Eight Superior Magnolias

- M. 'Sunspire.'* This most superior tree has precocious yellow blooms and they appear late enough to avoid most frost damage. It has a good upright form and is hardy in zone 5. It has no problem with freeze damage or canker. This tree is number one yellow magnolia selection.
- M. 'Daybreak.'* This magnolia has it all. The precocious blooms are a true pink and very fragrant. The tree is hardy in zone 5. It has a good upright tree form and there is no problem with freeze damage or disease. This tree blooms from an early age, avoids frost damage to the blooms and is the top ranking pink flowering magnolia.
- M. 'Elizabeth.'* The precocious blooms are yellow and stay in bloom for a long period of time. This tree will bloom from an early age and is hardy in zone 5. *M. 'Elizabeth'* is of the oldest yellow hybrids selections, but it is still one of the best.
- M. 'Sunburst.'* This tree is probably the most floriferous of all blooming magnolias and it blooms from an early age. The precocious blooms are yellow and avoid most frost damage. The tree is an upright form and is hardy in zone 5. The leaves are an attractive dark purplish green color.
- M. 'Yellow Bird.'* This tree is probably the fastest growing hybrid that has been selected. Its blooms are yellow and it is the hardiest of all in zone 4.
- M. 'Yellow Lantern.'* This tree has a very attractive upright tree form and carries a good central leader. The precocious blooms are lemon yellow and are cup shaped. The unopened flowers sit upright on top of the branches like Chinese lanterns.
- M. 'Gold Star.'* This tree holds a central leader and forms a round head. The precocious yellow blooms are star shaped. The leaves first appear in a bronze color, then turn to an unusual copperish green. The tree blooms late enough to avoid frost and is hardy in zone 5.
- M. 'Golden Gift.'* This tree is special because, it is a semi-dwarf and will not outgrow a small plot. The precocious blooms are yellow and are placed along the entire length of the branches. The blooms open in sequence and last well over a month. Golden Gift is hardy in zone 5 and has no problems with canker or bark splitting as do many of the older cultivars. 🌸

In the next issue, Mr. Pennington will discuss his chip-budding techniques in detail.