

## Successful Chip-Budding Techniques for Field-Grown Deciduous Magnolias

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Having been born and raised in McMinnville Tennessee (sometimes called the Nursery Capitol of the World) my life has revolved around nursery work. Much of that nursery work had to do with grafting, mostly using T-budding and chip budding. In McMinnville, propagation by grafting was (and still is) an integral part of any successful nursery enterprise. Usually a "grafting team" of two people (one person to cut and insert the bud, the other to tie and wrap it) work together along specified nursery rows. The team is expected to graft 2000 buds per day. To achieve this kind of proficiency, a grafter would have to start young—just like an aspiring golfer or tennis player would.

Although my first job was that of the guy who tied and wrapped the bud with rubber bands, eventually I learned to be a grafter. And fortunately for me, I started budding peach trees using the T-bud method when I was just 14 years old. After finishing peach budding in June, there would be only little rest before we would begin dormant budding of ash, maple, and other shade and ornamental trees. The tree varieties to be last budded that in the season would be the large patches of dogwood that were always overplanted and overbudded so the supply would always be greater than the demand. We would bud up to the 19th of September and stop, because the bud would need at least two weeks to heal before experiencing a frost that would send the sap down. The nursery owner would keep a record of the row numbers and sections that each person had budded. With this record he could determine who was doing the job right. The following year he could choose only the most conscientious budders. In those days getting work was not easy, so you had to learn how to make that bud live, or I will let you guess what happened.

For the last 10 years, I have worked on the techniques of propagating magnolias, and I will share some of my experiences with you.

In the fall, we line out the magnolia rootstocks after the sap has gone down, which is the best way of establishing the rootstocks. We line them in the field spaced to ball, about 2 ft (0.6 m) apart down the rows, which are spaced 5 ft (1.5 m) apart. The lining of 2 ft down the row is based on the plan that every other tree will be dug at a minimum size, leaving the rest of the stand to be dug by a machine digger when the trees reach a larger caliper.

**A**fter the rootstocks have put out in the spring and are in a growing state, they are side dressed using a fertilizer foot (an attachment on the tractor). The foot goes under the ground about 3 ft (0.9 m), lets the fertilizer fall into the furrow, and then covers the fertilizer as it passes through. This dressing is placed about 8 to 10 inches (20 to 25 cm) from the new liner. We do this on both sides of the row and usually fertilize this way in the spring and again the first of July. We fertilize again in July because the trees will be budded the first of August and this gives sufficient time to bring the sap up. If the sap is up, the bud heals faster and stands a better chance of sticking.

The liners are sprayed during the growing season by mixing liquid fertilizer, fungicide, and insecticide all in one mix; the foliage is then sprayed every seven days. The literature that I have read states that magnolias don't have any hinderance—I think that they need to grow a crop of trees.

We then cultivate the rootstocks for two growing seasons before budding them, because magnolias usually do not push up a clean straight trunk if the root system is not well enough established. Typically the rootstock grows from 6 to 8 ft (2 to 2.5 m) high during the summer, and the trunks grow in caliber from 1 to 1¼ inches (2.5 to 3 cm). (As you know, magnolias gain most of their caliber in the fall of the year.)

If you can put an irrigation system on the trees to be budded, then you can dormant bud them. Sometimes it can be too dry in the fall to bud without irrigation, as we found out in the fall of 1999 (the driest year in history). We dormant budded 5000 and only got about a 5% stand because of drought damage. Otherwise, spring budding in the field is the best way to get a good take because the sap is steadily rising and there is more rainfall to keep the ground moist while the bud is healing.



During my earlier days in the nursery trade, we used the T-budding method on every form of tree budding that was done. I can remember back in the 70s when a friend started using the slab budding method on cherries. This method only yielded a low percentage of live buds. I was interested in a new way of propagating other than T-budding, so I looked into the chip budding method. Most books on this subject are very good except for one key element. They show a thick bud in the diagram. I tried chip budding for the first time and only got a small percentage. The reason was that I was cutting a thick bud like the ones shown in the diagrams. The bud will not live if it is cut with too much wood. I learned, with a lot of practice, to cut the bud as thin as paper, getting only enough wood to clear the bud. This was my big hang up in chip budding, but now I can get a 95% stand with this new understanding.

If you are planning to spring bud, collect scion wood in February, just before the sap starts to rise. I have had failure in gathering scions while they were frozen. Scions should be taken after they thaw out and sufficient moisture has been regained, or after a rain. Wash the scions in a 10% bleach solution and rinse. Next, dip them in a fungicide mixture and let drain to almost dry. Finally, wrap the scions in plastic, making them airtight, and store them in a cooler at 36 to 40 °F (2 to 4 °C).

Spring budding should be done as soon as the seedlings start into active growth. Two people should do the job. One person should do the budding and the second do the bud wrapping behind the budder. Before budding, first, go through and wipe a row of trees down with a piece of cloth. The budder should determine which side to place the bud. The bud is best placed on the west if the rows run from north to south; if the rows run from east to west, the bud should be placed on the south side of the tree.

Make the first cut in the seedling at about one-inch from the ground. The cut should be at a sharp downward angle. The second cut should be from the top



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A block of *M. 'Elizabeth'* in the field.

of the bud to the bottom where the first cut was made causing the chip to fall out without touching it with your hand.

Next, make similar cuts on the scion, leaving the chip between the knife and your thumb so the exposed cut is not touched by your hand.

Place the chip into the seedling from off the side of your knife without letting go with your thumb until it is in place. Don't worry about making cambium contact on both sides of the cut because the seedling is usually calibrated too large anyway. Make the cambium contact on one side.

The second person should estimate the size of the tree to be wrapped and break off the 1/2-inch plastic film. Then, start tying just below the bottom of the bud and wrap the bud entirely without covering the bud itself

The next step is to wait about two weeks for the bud to heal, then cut about one third of the top out of the seedling. This will send the sap down the tree causing the bud to break in about one week. After this happens, cut another one third of the seedling off, so the bud will put out. Wait one week and then cut the seedling off just above the top of the bud. Cutting the seedling back in three steps will help force the bud out and prevent it from bleeding. If there is still some bleeding from the top of the stump, then you can plow them close to the roots to help slow the sap flow.

**Y**ou can now cut the plastic film wrap by making a slice from the bottom of the tie to the top of the tie by cutting through it and into the bark of the stump. Don't worry about cutting into the tree, because it will heal and don't try to remove the plastic from the tree because it could break the bud off and it is also labor intensive. Let the weather do the job for you. At this point, it is a good time to put the bud guide in place, to prevent a dogleg in the base of the trunk.

Keep the new buds sprayed once a week and after they reach a height of 12 to 18 inches (30 to 46 cm), side dress them with fertilizer mixed at one-half the rate. After the trees get too tall for the tractor to straddle them with the side dresser foot, and the trunks have hardened off to a fair extent, you can fertilize them by hand. Put one handful of a premium fertilizer (analysis of 13-13-13) at each tree and spread it out about six inches away from the trunk.

A note about knives. Using the right knife to make the budding cut is a must for any good bud stand. I have seen amateurs use scalpels for budding trees. I have tried this and only bruised the bud to the point that it would only sour on the tree. I have read articles where some one has been successful using a razor. I have tried the razor, just to see what could be done with one and determined that it would be extremely slow and clumsy, and you can cut your finger off with it.

The proper knife to use for chip budding is a one-piece budding knife made of German Tina steel. A budding knife has a double bevel that means that you can sharpen it on both sides. Don't buy a grafting knife to do budding with, because it has a single bevel and when you make the cut, the knife will bruise the bud. This soft German steel can be made as sharp as a razor. A budding knife can be purchased in any of the three nursery stores in the town where I live, which is, after all, the Nursery Capitol of the World, or one can be ordered from a nursery supply mail order company. This knife is a must for anyone who wants to do serious budding. 🌿

