How to Layer chestnuts.

Cloning your best trees is possible through stool bed layering or what we simply call “layering”. Cloning your best chestnut trees allows you to make identical copies of a tree that you believe is a superior tree. Clones of a superior tree you can plant on final spacing to increase productivity or expand your orchard and share or trade the best genetics with other growers. In only a few easy steps we can do this by encouraging sucker (a.k.a. shoot) growth, then encouraging root growth on the suckers and then dig them up before they start to grow again in the following spring. Of course, there are more details we need to know to be successful, but it isn’t difficult to do. Cloning a known tree via layering is lower cost than most seedlings without the unknown production, disease resistance and double planting needed for seedlings.

There are four main steps to cloning your best trees.

1. Winter pruning or coppice

You want the roots to have excess energy so they will send up new suckers for you to clone. Now that we know we really like a tree and want to copy it, we want to encourage sucker growth. If your tree doesn’t produce suckers at the base of the tree it usually means the tree is getting mature and the base is shaded enough that sucker growth is hindered. To encourage sucker growth, you will need to prune the tree back by 30% to 50% during dormancy. If the tree is deformed from a storm or has other serious life-threatening issues you may want to coppice (otherwise known as cutting down the tree). Heavily pruned and coppiced chestnut trees almost always produce many suckers the following spring. There are many references for pruning you can find one reference is here: Tips On Chestnut Tree Pruning - Learn About Trimming A Chestnut Tree | Gardening Know How

Figure 1 Mulched chestnut tree in preparation of stool bed layering

2. Spring mulching

What you need: Mulch, tarpaper or similar, two or three stakes per tree that are 16” long.

Most orchards mulch their trees anyway in the spring, except this year you will mulch six to eight inches deep in a circle that is 12 to 16 inches outside the bark of the tree before buds break if possible. For example, if your tree has a diameter of 6 inches then you will form a circle a minimum of 30inches (6” + 12” + 12”) in diameter. You will then need to hold the mulch in place using tarpaper or plastic. To hold the tarpaper or plastic in place you will need a minimum of two stakes pounded into the ground and staple the tarpaper/plastic to the stakes. The suckers will sprout through the mulch and develop stems in the mulch that allow us to have easy access, to apply hormone and then have easy access to dig up the roots. Check the depth of the mulch monthly to maintain a minimum of six inches of mulch.

3. Summer hormone application

What you need: 75 lb. strength nylon zip ties, Petroleum Jelly (a.k.a Vaseline), IBA-K hormone.

Timing of when to put hormone on the suckers is very important. It is best to check when is the average first frost in your area and then go back 60 days. For example, in Cortland, New York the average first day of frost is October 1st. Therefore, you want to start layering August 1st through August 14th. This time period will allow six weeks to eight weeks for roots to form. Too early the suckers are growing too fast and will only choke and die. Too late in the year and the roots won't form in time. If you have coppiced your tree, leave one or two suckers alone to grow to replace the original tree. You will be applying a hormone known as salt of Indole-3- butyric acid (IBA-K) to the base of the stems with a small brush. Before applying to the base of the tree you will need to order the IBA-K from your local hydroponics store or on-line retailer like Amazon or eBay. Purchase heavy duty nylon zip ties with a minimum strength of 50 lbs. at your local hardware store or online retailer. Do not use lighter weight nylon zip ties or they will probably break due to stem growth, wasting your time. Strip off the bottom third of leaves from each stem. This will allow you to see the stems and apply the hormone.

How to prepare the hormone and petroleum jelly. The typical Petroleum jelly you buy at your local drug store or your "dollar "or "value" store is 262 ml (7.5 oz.) of Petroleum jelly. To have 4000ppm of solution of IBA-K in 262 grams (7.5 oz) of petroleum jelly you will need 0.848 grams of IBA-K. If you have very accurate scale to measure fractions of a gram, you are good to go. Otherwise, a close approximation is measure out 1/8 teaspoon and also a ¼ teaspoon of IBA-K into 2 tablespoons of room temperature water and stir until dissolved. Then mix solution into 262 gram (7.5 oz.) jar of Petroleum jelly until smooth. Careful not to splash hormones while mixing. It is highly advised to warm up the Vaseline to a liquid prior to mixing. How to melt petroleum jelly into a liquid according to Bing is to, "Fill a small container with petroleum jelly, then empty the petroleum jelly into a microwavable bowl. Microwave at 30 second increments until just melted. Alternatively, you could melt the petroleum jelly over low heat in a double boiler." In previous studies 2000ppm of IBA didn't generate roots, while 5000ppm of IBA can kill suckers, so measuring properly is very important.

Figure 2 IBA-K hormone measurement for 7.5 ounce of Petroleum jelly.

Prior to putting on hormone, pull away mulch from suckers and expose the lightly colored stems. Hopefully the lightly colored part of the stem is four to six inches long and is the part of the stem that is hidden in the mulch. An inch or two from the very bottom of the exposed stem place a nylon zip tie snugly to the base without crushing or breaking the stem. Too loose and the stem won't form roots. Lightly scrape the stem about ½ inch above the nylon zip tie for two inches in length, and scrape again on opposite sides of the stem. Liberally apply the IBA-K Vaseline mixture with a small brush the hormone mixture ½ inch above the scrape, all around the stem and down to the zip tie. Replace restraining tarpaper or plastic and refill mulch to the original levels as shown in Figure 1.

Figure 3 Nylon zip ties, stem scrapping in preparation for 4000ppm IBA-K hormone to be applied to stem. Note leaves on the ground from stripping the bottom third of the stems leaves.

4. Fall/spring dig up rooted clones.

After the leaves have turned brown and are falling off in the fall and before the buds swell in the spring, you will dig up the suckers. You will need to gently pull back the mulch with your hands gingerly to not break the tender roots. Once you see roots, work your way under the roots to the nylon zip tie. Cut the sucker below the nylon zip tie and gently lift the cloned tree from the rest of the suckers. Sometimes you have to cut a few suckers and pull them out at the same time as the roots are so intertwined you cannot pull them apart separately without damaging the roots. If you do pull up a few trees at once you can sometimes shake the soil/mulch off and then separate the roots. If you cannot separate them after shaking off the soil/mulch, then dip the roots into a bucket of water and they will separate much easier for replanting.

Aftercare

Although not part of the actual cloning, there may be some efforts of protecting the less than ideally rooted trees you may not be used to dealing with. Heavily rooted trees can be planted out in their forever home directly and care as normal for any tree you plant. If the new clone has less than six main roots with secondary roots then we suggest temporarily planting in mulch or potting them while keeping them well watered and protected from wind and too much direct sun. Also pruning back the stem to only a few buds helps match the roots to the stem, as should be done for the second from the left of clone in Figure 4. One way to protect is to put on a tree tube that is the same height at the stem, with two or three stakes for a couple of weeks, while the buds elongate and slowly open the tube over a few more weeks to be more exposed to the wind and sun.

Figure 4 Well rooted stems on three of the five suckers, with one without roots and one poorly rooted that will need extra care.

Disclaimer: Follow manufacturer directions fully for all products purchased. We are not responsible for any injury or death of tree or any damage to person or property. Always wear proper personnel protection equipment that includes but not limited to eye protection, gloves and air filtration.

"This material is based upon work supported by the National Institute of Food and Agriculture, U.S. Department of Agriculture, through the Northeast Sustainable Agriculture Research and Education program under subaward number FNE22-033. "Any opinions, findings, conclusions, or recommendations expressed in this publication are those of the author(s) and do not necessarily reflect the view of the U.S. Department of Agriculture."

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