

## Morse Method — Modified Kines/Quesenberry Approach

### Introduction

#### About the Method

Don Kines and Mountain State Chestnuts have inspired several people to graft chestnuts. His epicotyl grafting method works well. However, there may be value in preserving the taproot, as doing so makes it much easier to keep the young, grafted seedling alive during the summer heat. Additionally, tying the graft union with a rubber band is tedious, and the rubber band must be removed or it will eventually girdle the graft. Jared Quesenberry (VA Chapter) modified the Kines method to graft young seedlings while keeping them in pots (an in-place grafting approach).



However, it is tedious to join the graft union without removing the seedling from the media, and securing the union with a rubber band further complicates the process. The Morse method keeps the taproot intact by germinating the seedlings in a cooler, giving the taproot plenty of space to grow. Additionally, it binds the graft union with parafilm or buddy tape—stretchable films that adhere well to themselves—to create a strong union. Parafilm/buddy tape is much less tedious to use than a rubber band, and they degrade over the summer, eliminating the additional step of removing the rubber band.



#### Materials

- Scions from desirable trees
- Parafilm laboratory tape or Buddy Tape
- 4×4×10 inch tree pots (cheap is fine)
- Scissors
- 2-gallon freezer bags
- Masking tape
- Cleaning alcohol
- Box cutter and Exacto knife
- Pruning shears
- Paper towel
- Cutting board
- 5-gallon bucket

# Chestnut Grafting Technique

## Step-by-Step Instructions

### Step 1 — Mix the Growing Media

Mix 70% pine bark and 30% peat moss by volume. The mix should be well-drained and acidic. **Note:** *there is no nutrient in this media.* Once the grafts take, supplement with slow-release Osmocote fertilizer for acid-loving plants.



### Step 3 — Label Your Pot

Label each pot with the scion and nut type. Some growers also record the mother tree to identify which trees produce nuts unsuitable for grafting (i.e., whether a particular tree consistently produces nuts that do not graft well). At a minimum, note whether the nut is American or a hybrid. Hybrids should be at least F1 (50% American), as American chestnuts do not graft well onto pure Chinese nuts.



The picture above shows a 60/30/10 mix (pine bark/peat/perlite) due to leftover perlite. The 70/30 ratio is more cost effective.

### Step 2 — Germinate Chestnuts

Germinate chestnuts in a cooler filled with standard potting mix. This keeps the taproot intact and ensures that the roots have ample space to develop before grafting. Seedlings are ready when they are about one month old.



### Step 4 — Prepare the Media

Fill the five-gallon bucket with your pine bark/peat media and wet it thoroughly. The media should be damp but should not drip when squeezed.

# Chestnut Grafting Technique

## Step 5 — Clean Your Cutting Tools

Clean all cutting tools (shears and knives) with alcohol and allow them to dry completely before use.



## Step 6 — Cut the Scion

Cut the scion to one or two buds and shave a wedge into the base of the scion.



## Step 7 — Remove Seedling from Cooler

Take the germinated seedling out of the cooler, keeping the taproot intact.

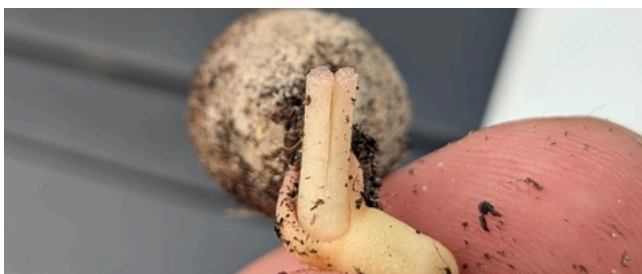


## Step 8 — Cut a Piece of Parafilm

Cut a thin piece of parafilm or buddy tape in preparation for wrapping the graft union.

## Step 9 — Cut the Epicotyl

Cut the epicotyl (the early stalk that will form the tree's main stem), leaving enough space to insert the wedge.



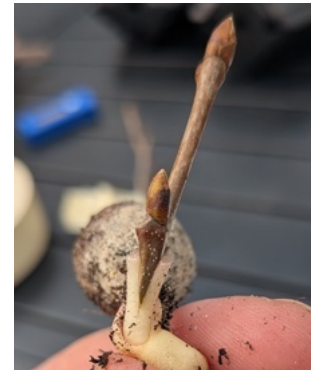
## Step 10 — Cut a Cleft into the Epicotyl

Make a clean cleft cut into the epicotyl to receive the scion wedge.

# Chestnut Grafting Technique

## Step 11 — Insert the Scion Wedge

Nest the wedge of the scion into the cleft. Line up the edge of the scion with the edge of the epicotyl as precisely as possible.

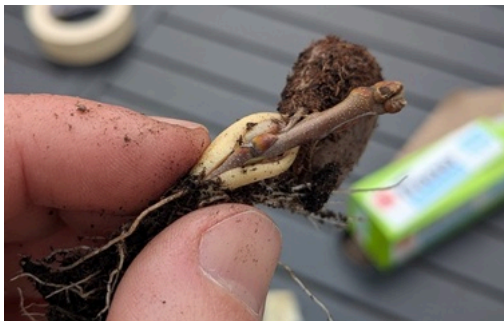


## Step 12 — Wrap the Graft Union

Wrap the union with parafilm as tightly as possible. The goal is to align as much of the epicotyl with the cut edge of the scion as possible. Wrap TIGHT!

## Alternative: Hypocotyl Grafting (if epicotyl fails)

Starting with the epicotyl gives you two chances to achieve a good graft. If you aren't successful with the epicotyl cleft, cut the epicotyl off down to the root collar and make a cleft in the hypocotyl (the young developing root collar) instead.



Then wrap the hypocotyl TIGHTLY with parafilm. --->



## Step 13 — Plant the Graft

Plant your graft in the tree pot filled with the pine bark/peat moss mix. Bury the graft union in the media.



# Chestnut Grafting Technique

## Step 14 — Bag the Grafted Chestnut

Place the grafted chestnut in a 2-gallon freezer bag to maintain humidity during the establishment period. Two pots can be placed in each bag to save space and materials.



## Step 15 — Initial Success

Between two and five weeks, some grafts will take and begin to leaf out!

## Step 16 — Harden Off

Once a graft takes, you need to harden it off to room humidity. The grafted seedling has been living in 100% humidity for a month, and if you simply take it out of the bag, it will likely die. To prevent this, you need to introduce the seedling to ambient humidity gradually.

### To harden off:

- Put 6 to 9 pots into a 20-gallon Ziplock bag.
- Day 1: Open the bag for 15 minutes, then close it.
  - Day 2: Open the bag for 30 minutes, then close it.
  - Day 3: Open the bag for 1 hour, then close it.
  - Day 4: Open the bag for 2 hours, then close it.
  - Day 5: Open the bag for 4 hours, then close it.



## Step 17 — Success!

Harden the seedling off to sunlight using standard procedures for hardening off seedlings. Afterward, either keep it in pots through the summer and plant while dormant, or plant immediately in its permanent location.