



## Grafting Avocado

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Tropical fruit trees are usually propagated through vegetative (clonal) methods, such as grafting. Vegetative propagation allows a grower to maintain consistent fruit production and quality by multiplying a known variety or cultivar of fruit. Avocados, like many tropical fruit trees, are propagated by grafting. This publication is intended to provide a step-by-step guide to grafting avocado in Hawai'i. For more information on propagation of tropical fruit trees, please see the *Tropical Fruit Tree Propagation Guide* ([https://www.ctahr.hawaii.edu/oc/freepubs/pdf/F\\_N-49.pdf](https://www.ctahr.hawaii.edu/oc/freepubs/pdf/F_N-49.pdf)).

### Supplies (Figure 1)

- Parafilm for sealing scion and graft union
- Pruning shears, sharp and clean



Figure 1. Supplies needed to graft avocado.

- Grafting knife, sharp and clean
- Rubber bands or grafting tape for holding scion and rootstock together
- Rootstock plant
- Scion piece (from a known source)

### Terminology

#### *Rootstock*

The rootstock is the base of the plant that provides the root system for the grafted tree. In Hawai'i, there is no clonal rootstock currently used, so most avocado rootstocks are seedlings. Many growers use seeds of a known variety that they prefer for rootstock establishment, which have desirable traits such as resistance to soil-borne diseases and pests. Seeds are planted wide-side down in well-draining sterile media and in deep pots (16" or deeper) to allow root growth (Figure 2). It usually takes 4–6 weeks for avocado seeds to germinate (Paull and Duarte 2011) and can take 4–5 months to reach a graftable size.

#### *Scion*

The scion will become the fruit-bearing part of the grafted tree. Scion pieces should be selected from terminal branches of a desirable avocado tree variety or selection. The best scion material is from matured and hardened shoots, not ones that are young and overly succulent. Choose a shoot with plump, well-developed buds ready to flush on the selected branch terminals. Although only one bud is necessary, it is best to have at least three buds present, so cut scions 4–6 inches in length. Remove the



**Figure 2.** This is an example of an avocado rootstock. A rootstock is typically grown from a seed.



**Figure 3 (top).** Step 1: Selecting scion. **Figure 4 (bottom).** Step 2: Selecting rootstock.

leaves at the time of collection and store the scion wrapped in damp (not drenched) paper towels in a plastic bag in the refrigerator until time of grafting. When making the union, try to match the diameter of your rootstock and scion for optimal graft take.

### Step-by-Step Guide to Grafting Your Avocado

**Step 1:** Select or grow your rootstock, as detailed above.

**Step 2:** Select your scion. When possible, use a scion that is of similar diameter to the rootstock (Figure 3). Try to harvest the scion and complete your grafts on the same day. Between harvesting and grafting, be sure to keep the scion wrapped as detailed above to provide some moisture and prevent drying (Figure 4).

**Step 3:** Remove the top (apical growing point) of the rootstock with a sharp, clean pair of pruning shears. Make sure the remaining rootstock is about 15 inches

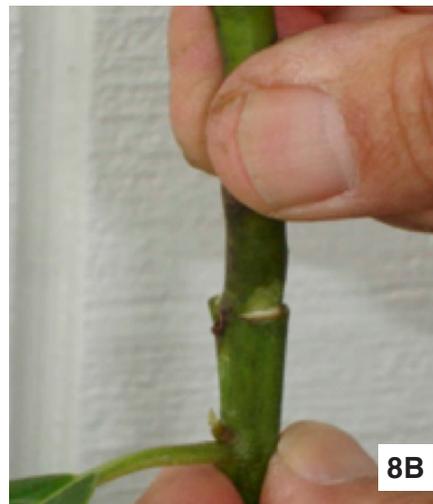
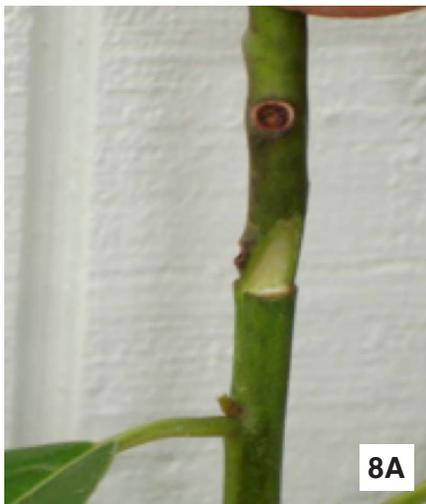
high, so that the graft union is far enough off the soil surface but not so high that it might be prone to break in the wind (Figures 5A–B).

**Step 4:** Using a sharp, clean grafting knife, carefully make a cut across the center of the cut surface of the rootstock. To do this, place the mid-point of the blade on the center of the cut surface. With a slight rocking motion of the grafting knife or mild tapping on the top of the knife, initiate the cut straight downward until the cut is about 1 inch deep. Carefully remove your grafting knife when the cut depth is obtained (Figures 6A–B).

**Step 5:** Now, holding the scion vertically with the buds (growing points) facing downwards, pull the grafting knife upward and diagonally through the base of the scion in one smooth motion. This will result in a slice that is approximately 30 degrees from the longitudinal axis. Turn the scion 180 degrees and repeat the same motion on the other side. Redo each slice as needed to achieve a



Figures 5A–B (top). Step 3: Removing/topping apical growing point of rootstock. Figures 6A–B (middle). Step 4: Making the cut into the rootstock with grafting knife. Figures 7A–B. Step 5 (bottom): Making the cut in the scion.



Figures 7C–D (top). Step 5, continued: Making the cut in the scion. Figures 8A–C (bottom). Step 6: Placing the scion into the rootstock. Figures 9A–C (opposite top). Step 7: Wrapping the graft with a rubber band. Figures 10A–D (opposite bottom). Step 8: Wrapping the graft union and scion with parafilm.

wedge-shaped base on the scion (Figures 7A–D).

**Step 6:** Next, pair the rootstock and scion together. Gently push the scion into the cut on the top of the rootstock. Match the outer edges of the scion with the outer edges of the rootstock so that the scion is firmly wedged into the rootstock. Having the edges flush will help ensure optimal take by having the cambium layers of the scion and rootstock in close and direct contact (Figures 8A–C).

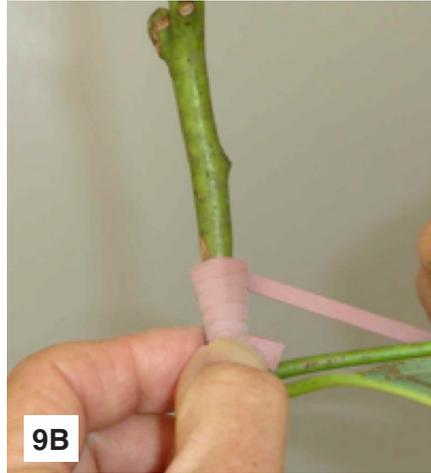
**Step 7:** Wrap the graft tightly with a cut rubber band or grafting tape to hold the graft in place. Avoid creating any airspaces where the scion and rootstock touch. Re-cut

the scion or restart from step 4 if an airspace is present and cannot be closed with the pressure of the rubber band (Figures 9A–C).

**Step 8:** Using a piece of parafilm, begin wrapping the scion from below the graft. Work your way upwards and then back down again. Wrap the graft union and the entire scion piece until they are completely covered to keep out potential pests and diseases from the cut surfaces. Wrapping will also help to retain moisture in the scion until the graft is successful. Once a union has formed, the rootstock will begin to provide water and nutrients to the scion (Figures 10A–D).



9A



9B



9C



10A



10B



10C



10D

**Step 9:** After grafting, it is important to keep the grafted plant well watered and in partial shade. It will typically take around 4–6 weeks for the graft union to heal successfully, at which time you will see new buds and growth pushing through the parafilm. You don't need to remove the parafilm, but you should remove the rubber band or grafting tape once the scion is growing successfully.

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