Plant Propagation Lab Exercise

Module 3 - **VEGETATIVE PROPAGATION AIR LAYERING OF CAMELLIA DEMONSTRATION**

An introduction to plant propagation laboratory exercises by:

Cheyenne Brodie-McAleister, Dr. Mack Thetford, and Production Director Lee Thrasher

In this lab, you'll be introduced to the vegetative propagative technique of layering, and we'll be showing the proper procedure for creating an air layer on Camellia.

Air layering is one of many layering techniques used to vegetatively propagate plants. Layering is a form of rooting cuttings where adventitious roots are produced while the stem is still attached to the mother plant. Once roots have been formed, the rooted layer is detached from the plant. It is a simple form of propagation that requires very little specialized equipment.

The simplest form of layering is bending a shoot or shoot tip to the ground and covering it with soil. Another technique is known as serpentine layering, which involves layering multiple sections along the same stem. Mound layering, also known as stooling, can be accomplished with shrubs planted in the ground, or within a pot. Air layering uses the same concepts as ground layering, but the layered stem is within the canopy, rather than on the ground. Layering is a good technique for rooting difficult to root plants.

There are a few steps common to layering techniques. The exclusion of light from a section of the stem this influences the auxin concentration. Using a rooting substrate for root growth. The flow of carbohydrates from the shoot tip to the roots is interrupted and this provides the building blocks for new root development. Contact of the layer with the stem and xylem is maintained which maintains nutrient and water supply to the developing layer and the mother plant continues to provide support to the propagule, also known as a layer, during root development.

Now let's identify the steps for making an air layer. 1) Remove leaves or small twigs around the wound 2) Girdle the stem. 3) Cover the wound area with moist sphagnum, peat, or coir 4) Cover the rooting substrate with plastic and seal each end 5) If using clear plastic, cover this with foil or black plastic 6) Monitor the substrate to ensure the layer is not wet. This is a very important step you want to make sure that the substrate is moist, but you do not want it to be soaking wet. 7) Check for rooting by lightly squeezing the layer and checking for firmness. 8) When layers are firm check for visible roots and if present, the stem can be cut from the mother plant and potted

 Now we will demonstrate the process of making an air layer.

First, let's cover all the materials that you will need for your air layer. You will need to obtain: a bucket filled with water, sphagnum moss, pliers, a small knife, rooting hormone, in this example we will be using Hormodin 1, a container for the application of the rooting hormone, a paintbrush, a label, clear plastic, and foil or black plastic. If you're using black plastic, you will also need twist ties or tape. Prior to beginning the layering process, you will need to place the sphagnum moss in the bucket filled with water.

The first step in air layering is labeling the stem. Place it above the area that will be rooted and secure it loosely, providing enough room for future growth. Next, check that the stem size is appropriate. A general rule is not use stems that are longer than your forearm. This helps to ensure that the shoots and roots will be proportional to one another. Now remove any small twigs or leaves that will be near the wounding site. Once you have a clear area to work with, you can now use pliers to girdle the stem. Go around the stem in a circular motion, and this may take a few rotations, using light pressure to strip away the bark.

 It may be necessary to clean up the area using a small knife, but once again use light pressure and be careful not to remove any extra layers. After girdling the stem, you can now use a small paintbrush to apply rooting hormone to the wounded area.

 Now prepare your sphagnum moss for application. Remove any large twigs from the substrate and wring out all excess water. You want to remove as much water as possible so that it is moist, not wet. Having too much water in the substrate upon application can prevent the air layer from forming successfully.

You can now place the sphagnum moss ball on your clear plastic. Now you’ll want to create a space within the moss to wrap the stem around. This will make the application much easier. You can now wrap the moss in clear plastic around the wounded area. Apply slight pressure to keep the ball intact and ensure that all sides of the plastic are stuck together to form a tight seal, especially around the top and the bottom of the stem. This will allow the moisture to be retained and prevent excess water from entering the substrate. Maintaining the moisture level within the substrate is crucial to rooting success.

 Next, you will need to apply a layer of foil or black plastic around the air layer, once again ensuring that a tight seal is formed, and that the entire area is covered. When using aluminum foil, it's easiest to twist the ends in opposite directions to form this seal. The purpose of this layer is to prevent light from entering. As mentioned, foil is not the only option that you can use when creating an air layer. You can also use black plastic to cover the layer. Once again you just want to make sure that the entire area is covered, a seal is formed, and light's not going to be able to penetrate. To secure this layer you can use twist ties or tape to seal the area around the top and bottom of the stem. As you can see here wrapping the black plastic can be a little more challenging at times. If you decide to use the plastic, I recommend wrapping the air layer, rather than trying to twist. Ultimately either method will work and what you select will likely depend on the materials that you have available. Here you can see what a completed air layer looks like.

Now let's cover the removal of an air layer. The layer seen here was installed in April or May. We are now in late September and the air layer is ready to be removed. First, check the firmness of the root ball. If it is firm, you can go ahead and check for visible roots underneath the layers of foil and plastic. If the roots appear healthy and well developed, remove all layers and cut below the root ball using pruners. Here you can see everything looks healthy, and it's time to remove the air layer from the mother plant. After removing the air layer from the mother plant place the layer into a bucket filled with water.

Finally, let's discuss potting an air layer. In this photo, you can see the placement of the root ball within the pot. When filling up the pot. You do not want to cover the entire root ball with soil. Be sure to leave the very top of root ball, indicated by the yellow arrow within the photo, exposed so that it sits above the soil line. This allows water to penetrate the root ball more easily. The final step is watering in the air layer. Once this has been completed, place the pot in a protected environment, such as a shaded area.

 Now we have covered all the steps required to make an air layer. When it comes to timing. It should be noted that the process must be initiated in spring, more specifically in April or May. Air layers will be ready to harvest in the fall months of September or October of the same year.