

## Air-Layering Techniques for Conservation of Rhododendrons and Azaleas®

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**Over the past 50 years or so many commentators have noted that air layering is not a viable method of propagation for rhododendrons and azaleas, or at best the results are generally poor. This paper describes a more practical approach developed from tests over the past 10 years, using basic tools and materials, which has achieved a success rate of around 90% in the author's garden and in field trials. In the past 3 years the methodology has been adapted to deal with conservation aspects relating to propagating plants that have been wind-blown and cannot be righted, plants damaged by falling trees, plants that are over-mature or dying back, and regenerating nursery stock plants. To date the results have been successful, including getting roots on air-layers where the plant itself is in poor condition or dying back.**

### INTRODUCTION

This paper describes methods for air layering to propagate old, difficult-to-root, or storm-damaged plants for conservation. Many commentators have suggested that air layering does not work, or at best the results are generally poor. However, the results that I have achieved over many years have been good, with a success rate better than 90%. Given that the methodology is one of the oldest techniques of vegetative propagation and was successfully used in China more than 4,000 years ago, this should not be a surprise.

### PROPAGATION TECHNIQUE

**Basic Requirements.** Tools needed include a pair of clean secateurs, a clean sharp knife, and a pair of scissors. Materials required are a supply of damp sphagnum moss, a supply of fine or medium chopped bark, a clean, unused black polythene refuse sack (avoid clear/translucent material, as any light will inhibit rooting), and a supply of 15-cm plastic cable ties. It only takes a few minutes to complete each air layer once you are familiar with the methodology but patience is then required for root formation to complete.

**Branch Selection.** It is important to select as upright a branch as is practicable, 45 to 60 cm long, branched in two or three places and sturdy enough to support the layering materials. It is best to choose a branch that is out of full sun, not only to keep the layer a more even temperature, but to prevent the medium inside the wrapper completely drying out. Although the layering materials need to be as light-weight as practicable, choosing too small a branch inevitably means it is under stress throughout the layering process and some form of support is required; it also leads to a very small root-ball that does not have much of a chance of establishment when the branch is severed and potted-on.

**Preparation of the Polythene Wrapper and Growing Medium.** Roll out the black polythene sack and, leaving the sack itself unopened, make three 25-cm-wide double-thickness strips by cutting directly across it.

Chop up a sufficient quantity of live sphagnum moss to loosely fill two-thirds of a 10-L bucket — a domestic kitchen liquidiser is ideal. Mix this with half the volume of medium or fine chopped bark. Add water to the mix until it is relatively wet. This volume of mix will provide sufficient medium for several air layers. Avoid using sphagnum moss by itself as this leads to the wound generating “water-roots” that will cause establishment problems later.

**Wounding.** I have experimented with four different types of wound and each has been successful. However, the most reliable method is to cut a 10-cm-long wound to expose the cambium. Completely remove the tongue that you have cut, as this will give the wounded area a better chance of rooting.

**Creating the Air Layer.** When putting the wrapper in place you are seeking to achieve a result that looks like an enlarged Christmas cracker rather than a ball, a cylinder which will be secured at each end with the plastic cable tie.

Take a large handful (about a litre) of the sphagnum moss and bark mix; this needs to be wet but not completely saturated, so squeeze out any surplus water. With one hand form the mix into a cylinder around the wounded area of the branch, then with the other hand wrap it securely in place with the black polythene to create a tube. Avoid wrapping too tightly as it is important that the mix remains wet, but it is equally important not to leave any large air pockets inside the wrapper once it has been sealed.

Fix the first plastic cable tie securely 4 cm from lower end of the wrapper as this will prevent part of the mix from falling out. Next, secure the top of the wrapper with a cable tie, and then open-up the loose ends of the wrapper so that the finished product looks like a Christmas cracker. Do not over-tighten either end of the wrapper, as it is important not to damage the bark — it does not need to be air-tight, just held securely in place. The upper end of the wrapper will act as a rain collector to irrigate the layer, the lower end acts as a drain to allow any surplus moisture, together with any salts generated during root production, to gradually leach away.

**Securing the Branch.** If the main branch tends to bend significantly under the weight of the air layer, or is likely to be blown around in windy weather, then secure it to another adjacent branch with a couple of long ties. Alternatively, if the air-layered branch is sufficiently low enough to the ground then, immediately below the branch, push a tall, thick bamboo cane well into the soil and secure the branch to it with ties.

## ROOTING PROCESS

These air layers must be left undisturbed for at least two full growing seasons and resist the temptation to open up the layer to check on rooting progress as that will break-off the very fragile roots before they have had time to mature. A good indicator to look for in many instances, particularly with deciduous azaleas, is that once the air layer has rooted the plant begins to send out several new branches from its main roots. In the case of larger plants there is nothing to show that rooting has commenced other than the branch buds-up in the autumn and branches well in the spring.

**Maintenance.** Little maintenance is required, other than an occasional check to see that the cable ties are not too tight and to pour a small amount of water into the top of the wrapper if there is a long dry spell of weather. Remember that the air-layered branch will continue to grow over the 2-year period that the roots are being formed, so the branch may get significantly thicker. Sometimes, if the cable tie is under pressure, it will snap; or the leaves will start to wilt. Ideally the cable ties should be replaced each spring and autumn to reduce the possibility of the cable tie girdling the bark.

### **GROWING ON**

**Unwrapping.** After two full growing seasons, cut the cable ties and carefully unwrap the polythene, taking care to support the new roots. Often the roots will grow partway into the layers of the polythene wrapper, so be aware of this. If there are only a few roots, or the roots are immature, then re-wrap the layer and leave it in-situ for a further year.

**Severing and Growing-on.** If the roots are mature then sever the rooted branch about 3 cm below the roots. Carefully tease and spread out the roots, plant in a wide 10-L plastic container. Position the bottom of the stem of the new plant against one side of the container, then hold the plant in place slightly diagonally so as the container is filled the upper part of the stem is centrally located when it exits the soil in the completely filled container. Get a piece of bamboo cane and insert this in the soil so it runs diagonally across the container and secure the main branch of the new plant to it with a cable tie or some twine.

The best potting mixture is pure medium chopped bark as this is relatively open and was a main component of the layering mix which helps minimise transplant shock. Place the container in the shaded area of a cool greenhouse for a year. The plant can then be planted out in a dappled-shade position, staking if necessary.

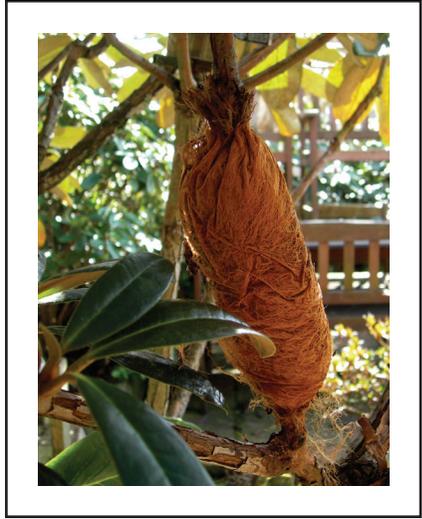
### **AIR LAYERING FOR CONSERVATION**

Air layering is a useful technique that can be used for conservation purposes to propagate a wide range of difficult to root woody plants without resorting to specialised equipment or disturbing the parent plant unduly. Many old rhododendron hybrids are notoriously difficult to root from cuttings, as are some modern hybrids with complex parentages. Similarly Ghent azaleas are problematic to propagate. Air layering presents an easy alternative.

If a rare specimen has been damaged or toppled by wind, providing that at least some of the roots are still in the ground, or the root-ball can be back-filled with soil, then it is well worth considering air layering a few of the branches to provide a replacement. The technique is also particularly useful for propagating a replacement for an elderly specimen reaching the end of its life. In instances of this type it is suggested that three or four air layers are attempted, each on a different branch, so there is an increased chance of success.



**Figure 1.** Air layer placed on *Rhododendron macabeaenum*.



**Figure 2.** Rooted air layer on *Rhododendron macabeaenum*.



**Figure 3.** Potted-up *Rhododendron macabeaenum* air layer.