

RHODODENDRON PROPAGATION

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REPAIR AND CLEAN HOUSES

Try to schedule your crops so that your propagating houses are empty for a week or two in spring or early summer. This time should be spent checking benches for structural weakness, replacing and repairing heating equipment, checking misting equipment and making major repairs to equipment and propagating facilities in general. The less you have to disturb cuttings after they are stuck the better, and taking care of these repairs in a vacant house reduces the chance of disturbing a crop for repairs at a later date.

After repairs are made, remove everything from the house that doesn't have a functional purpose, all plant material, such as scraps from previous crops and weeds under benches and in aisles. We grow our plant material up off the floor so we can use Pramitol PS for weed control on soil floors and in walkways. This material is a soil sterilant and is quite persistent in the soil so don't use it if you need the ground you're putting it on in the next couple of years. We get bare ground control of everything with it and that's what we are after.

SANITIZE

All surfaces should be washed with a pressure washer, or scrubbed with a good detergent. All wood surfaces should be painted or treated with a copper naphthenate wood preservative such as Cuprinol. When you are satisfied that your propagating house is as clean as you can get it, it's time to fumigate. We use 1 part 35% formaldehyde in 50 parts water. We have wood and glass propagating houses and in my estimation these are the most difficult to clean because of all the corners and crevices where unfavorable residues may persist. For this reason, we precede the formaldehyde spray by going into the house with a high pressure, high volume water hose and soak everything down just prior to spraying. Formaldehyde works much better on a wet surface.

We like to disinfect on a warm sunny day so that we can close the houses up tight afterwards and let them "cook" for about 24 hr. We then open them up to air out and leave them until the odor of formaldehyde can no longer be detected. Formaldehyde is dangerous and the operator and/or applicator should be protected from it. We use a full-face gas mask and protective clothing while handling it.

THE PROPAGATING BENCH

An elevated bench is a must, in my opinion, for propagating broadleaved plants. The biggest problem we encounter in the propagation cycle is harmful pathogen infections. Keeping the cuttings up off the floor avoids infections that could be dragged in on someone's shoes; it also puts the plants at a convenient working height which encourages close inspection at frequent intervals, another necessary preventive procedure.

Our benches are constructed of 1 x 6 lumber. The sides are 6" high and the bottom is open and covered with ¼" hardware cloth and a layer of 36" saran screen. This gives us excellent drainage and good heat penetration to the soil since our heat source is under the bench. The legs of these benches can be built of any suitable material; ours are pipe; however, concrete block serves the purpose quite well, as would a number of other materials. A poorly designed bench with inadequate drainage can put you out of the rhododendron business before you get into it.

MIST SYSTEM

There is no better way to maintain the vigor of a rhododendron cutting while waiting for root initiation than a mist system. We have systems that were built at different times and have used galvanized, copper, and plastic pipe; plastic (PVC) is the best. We have far less corrosion and scaling with plastic pipe and we get no dielectric reaction that happens between galvanized and copper or brass which creates an acid condition which deteriorates pipe. The end result is that we spend far fewer hours cleaning nozzles and making repairs. Our mist system consists of a 1" pipe lying on the bottom of the propagating bench with a "T" every 3 ft and a ½" x 3' riser above the bench. We use a Flora-mist nozzle. Care must be taken to get all risers the same height as a variation in height will cause a wet area around the shortest risers and will or could cause interference with the number of seconds that the mist is in operation if all risers are not full when the solenoid opens.

We use a number of timing devices, but the two we like best are a McPenny Leaf system and a six-minute interval clock (Model 6M8001 Tork Timer). The electronic leaf prevents overwatering in cloudy weather, but be careful of its location in the house, especially if some of the house is shaded during the day. It is not as trouble-free as the six-minute clock, however.

ROOTING MEDIUM

Every rhododendron propagator has his own ideas of what a good rooting medium should consist of and if it works for him,

then it's the right one. What is best for us is a relatively simple formula: German peat — 3 bales (6 cu ft); agricultural grade Perlite — 1 bag (6 cu ft); and 2 bushels sharp sand. We use silica sand, which is readily available in our area; however washed river sand and other sources of clean sand work quite well for people in other areas.

We mix our medium with a flail-type manure spreader in a shed with a concrete floor which is kept as clean as possible. After the batches are mixed, we fill the benches, wet the medium and begin taking cuttings.

THE WOOD

We attain our highest percentage of rooted cuttings when we take the wood from the 1 and 2 yr old beds or from container-grown plants of the same age. The diameter of the wood makes a difference. The most desirable diameter is about that of a pencil or a little smaller. Cuttings should be taken from the tops of the plants since those near the ground may have been splashed with soil with fungal organisms. It's a good idea to wash them in a wetting agent and fungicide as soon as they are brought into the greenhouse.

We put 50 gal of water in a drum and add a half a cup of L.C., a wetting agent marketed by Bestline Company, (any good wetting agent will do). We add to this 4 oz. of Captan W.P. and stir. We have no agitator in the tank and each time cuttings are washed in it, it is stirred prior to adding the cuttings. We usually wash 4000 to 5000 cuttings in 2 or 3 batches and then change the solution.

After the cuttings are drenched, we take them out and put them in a draining basket made of 1 x 6 pine lumber for sides and ¼ inch mesh hardware cloth bottom. This frame is on a two-wheel cart and while the plants are draining they may be moved to the work area. The plants may be washed and removed to the drainer immediately or they may be left to soak for a number of hours when needed — never overnight, however.

PREPARING THE CUTTING FOR THE BENCH

We remove all but three leaves from the uppermost portion of the cutting and remove the center bud from the leaf axil. This leaves a bud at the base of each individual leaf but no terminal bud. We then cut the stem to about 4 inches in length. We keep the length as uniform as possible to simplify sticking them to the proper depth. After the basal cut is made we wound the base by removing about a half-inch of the bark to expose the cambium layer and dip them in hormone powder, shake off the excess and place them in a clean flat for removal to the propagating house.

HORMONE TREATMENTS

We make our own hormone powders in three basic strengths: 0.5, 1, and 2% IBA. We use the 0.5% for azaleas and very soft cuttings, the 1% with hardened white and pink rhododendrons and *Pieris japonica*, and the 2% sparingly, generally only on red rhododendron and a few very hard pinks. If the base of the cuttings turn black a few days after sticking them, a stronger hormone than was necessary may have been used. The formula that we use was provided by the Ohio Agric. Res. and Dev. Center at Wooster, Ohio* and consists of 10% Benlate 50% WP, 1 or 2% IBA, 88 or 89% talc (depending on percent IBA), and 50 ppm boric acid. Another formula which we have used but which seems to produce a larger callus is 10% Benlate 50% WP, 1 or 2% IBA, 50% Cutstart #4 (strongest type), 38 or 39% talc (depending on percent IBA) and 50 ppm boric acid.

WHERE TO BUY AND HOW TO MIX THE HORMONE

I do not endorse any of the following brand names, but I feel that the beginner and some old-timers will be interested in our source of materials. IBA is purchased from Eastman Organic Chemicals, Rochester, New York 14650. Talc and boric acid we purchase from our local druggist; the talc we buy in 20 lb. bags (a good brand is Chemline). Benlate and Cutstart we purchase from horticultural suppliers.

Pure IBA is generally purchased in crystal form in 5 g vials. IBA crystals are not soluble in water. I make up a 10% stock batch of IBA and talc. To do this, I prepare 10 g of talc. The ingredients are put in a blender and mixed thoroughly. It is then poured into a clean poly dishpan and the alcohol allowed to evaporate. The 10% IBA is collected and stored to be cut later into whatever percentage is desired.

When mixing a batch of dry powder, all ingredients are carefully weighed on a gram scale. The ingredients are added to a jar mill and thoroughly mixed for a number of hours. They are then stored until used in a tightly sealed and properly labeled container. We make only what we will use in about a 90 day period at one time to insure that we always have a fresh mixture.

If you don't have your own equipment and would like a custom-mixed hormone, one of our members, Mr. Carl Gullo of Mentor, Ohio, does a fine job of mixing what I affectionately call, "Gullo's Goodies," and will custom mix hormones for plant propagation to your specifications.

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STICKING THE CUTTINGS

We use a 1 x 2 board cut to the width of the bench to space our cuttings and usually stick the cuttings about 1¼ inches apart; this gives us a high density planting. It is important to watch for fungus problems during the rooting period.

After sticking about 400 sq ft (18,000 cuttings in 3 days), we drench the entire bench with Benlate at the rate of 8 oz/100 gal and approximately 1 pt/sq ft. We use only one Benlate drench while the cuttings are rooting. We will drench again after they are transplanted.

All material in the greenhouse is sprayed weekly with one of three chemicals; Dithane M-45, Captan, or Daconil 2787 on a rotating basis and according to package directions. We do not use insecticides unless inspection shows a definite need for it.

Since the cuttings are under mist, the watering schedule should be watched carefully. We use a moisture probe (Harbor Industries Inc.) and try to keep the moisture level at about 40%. All watering is done by hand for two reasons: 1) it allows for spot watering and eliminates overwatering in areas which normally do not drain evenly, and, 2) it gets us into the houses often to make a visual inspection of the benches. When everything is automatic there is a tendency to let visual inspections go until we have time and we never seem to have the time.

We use only one peg on our interval misting timer which gives us 6 sec every 6 min, but we have to watch it closely during cloudy weather. It is possible to get things too wet with this system. With the McPenny Leaf the system determines its own interval. We are careful not to get the leaf in a location that is not representative of the area it is working in. Cloudy days are not a problem since it will not operate if the water is not evaporated from the leaf.

LIGHT AND TEMPERATURE

We want as much light as possible and our best percentage rooting occurs when we have mostly sunny days during the propagating season. We use bottom heat under our bench and try to maintain a 70°F medium temperature, but the ideal air temperature above the cuttings is 50°F. This will prevent the cuttings from breaking a flush of growth before they have rooted. Good ventilation equipment in the propagating house will aid in maintaining the air temperature. When propagating a valuable crop like rhododendron, I don't believe one can be overly cautious.

Using the above system, we propagate about 200,000 ericaceous plants a year in approximately 4,000 sq ft of propagating bench at a cost of about 35¢ per unit. Systems will vary somewhat in different greenhouses and everyone must work with his system

until it returns the highest percentage of success. We're still experimenting with new ideas and hope to come up with a fool-proof system.

One of the best ways to get into trouble is to be lax on the sanitation program. We clean all vegetation material such as scraps from cuttings, etc., out of the headhouse every evening. We wet the floor down before sweeping so that we do not put a lot of dust into the air. All floors and aisles are sprayed at least once a week with a solution of LF-10. Keep hose nozzles off the floor and wash your hands when leaving one house before going into another greenhouse if you've been handling plants. Just keep in mind that it is possible to realize a money return of somewhere around \$40/sq ft of propagating bench, if you do everything right.

MODERATOR FLEMER: Thank you, Mr. Henrietta; that was excellent coverage of basic rhododendron propagation. Our next paper is by Harold Stoner and because everything is not started from cuttings, Mr. Stoner is going to talk to us about grafting.

GRAFTING, FROM SCION TO PLANT

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Westminster Nurseries is an old firm that was founded in 1893 by my grandfather, Mr. J.E. Stoner, growing mainly fruit trees. Many changes have taken place since then. One concept, formed back in the 1940's, has not changed and we believe this to be the basic success of our nursery; i.e., we have tried to be diversified in the types of plants we grow to satisfy most of the needs of the landscape trade to the best of our ability. Since we wanted to raise many different types of plants, including some of the unusual ones, we started the grafting procedures which we are still using today.

UNDERSTOCK AND SCIONS

On or about December 10th, the understocks are removed from the cold frames and brought into a greenhouse where they are kept at a temperature of 65°F for 6 weeks. We use 2-yr-old understock which has been potted in 2¼ inch deep clay pots.

Scions (from stock plants that have had no contact with herbicides) are collected on a daily basis to assure no loss of vitality. They are taken only when the temperature is above freezing, moistened, and stored in a room temperature of 35°F.