

PROPAGATION OF MAHONIA SPECIES AND CULTIVARS

DENNIS M. CONNOR

Monrovia Nursery Company

P.O. Box Q

Azusa, California 91702

When I am asked the question of which plants are the hardest to propagate, I recall to mind several, and the mahonias are always on that list. While seed propagation is generally easy for most cultivars, propagation from cuttings can be difficult. There are many species and cultivars of *Mahonia*, and I myself have worked with *M. aquifolium*, *M. aquifolium* 'Compacta', *M. repens*, *M. bealei*, and *M. lomariifolia*. *M. bealei* and *M. lomariifolia* are easy to grow from seed and do not require and special treatments. Germinating seed of *M. aquifolium* and *M. repens* require a more elaborate procedure. *Mahonia aquifolium* 'Compacta', which is grown from cuttings, is rather difficult to root. It seems that I have tried every propagation technique and combination thereof to root 'Compacta'; 20% to 50% rooting is normal for myself, working with 300,000 to 500,000 cuttings a season.

This report will then be on the germination of *Mahonia aquifolium* seeds, with the same principle applied to *Mahonia repens* seeds, and also on the rooting of *Mahonia aquifolium* 'Compacta' cuttings.

Let us discuss germinating *Mahonia aquifolium* and *Mahonia repens* seeds first. *Mahonia* seeds ripen in Southern California from late May to mid-June. We collect the seed from field-planted stock and also our container stock. The seed is taken to our seed department and put into a commercial blender, along with a little water, where the seed is removed from the fruit. The mash of seed and pulp is then put into a small tub and washed and strained several times, leaving the clean seed as the end product. The juice from the seed pulp is a dark blue-black color which stains readily, so the use of gloves and an apron is recommended. The clean seed is then put into cloth bags and undergoes a leaching process using domestic water. Evidently, seeds of some *Mahonia* cultivars contain chemical inhibitors which make the leaching process necessary. We made up a PVC pipe manifold to which we can fasten with string the bags of seed to be leached. Water is run through the seed for about a week. After leaching is completed, we then need to stratify the seed for 90 days by mixing the leached seed with perlite and putting it in clean plastic bags, and refrigerating it at 38°F. After the stratification time is up, we are now ready to plant the seed into flats with a seed soil

composed of two-thirds peat moss plus roughly equal amounts of very fine perlite and plaster sand. We steam pasteurize the soil before any planting is done. The surface of all the planted flats receive a light topping of silica sand, a #12 grade. This helps in keeping the surface dry and in preventing damping-off problems, yet the soil underneath stays moist. Next, we put the flats onto racks in a refrigerator at 45°F for another 60 days. This second stratification just seems to enhance germination of the seeds. We then remove the flats from the refrigerator as germination begins and put them outside under a 55% saran shade and let them grow for a while before potting the seedlings into liners. We prefer to grow them as multiples of three plants in a 3 in. pot. That is also the way we grow them on in one gal. cans. A single plant usually looks too scraggly even when mature. It is also important not to root prune the mahonias during transplant as they do not take it too well. Also avoid potting them if the weather is very warm. Production time from the collection of seed to a usable liner is about nine months.

Since *Mahonia aquifolium* 'Compacta' does not come true from seed, cuttings are necessary for propagation. Cuttings are collected from field-planted and container stock. Preferably, cuttings should be collected in fall or winter. However, some success with summer cuttings has been achieved. We spray all of the stock plants with 200 ppm Physan prior to collecting the wood. Tip cuttings are taken. After collecting the wood, the workers in the cutting department prepare the cuttings, making them 4 to 5 in. long. We recut the stem again about ¼ in. below the basal-most node. The lower ¾ of the leaves are pulled off the stem, leaving 4 or 5 leaves at the top. Once the cuttings are prepared, we immerse them into a pre-wash solution of 15 ppm chlorine followed by a second immersing into a solution of Benlate. Next, the cuttings are ready to stick into flats of 90% perlite and 10% peat moss which is steam pasteurized right in the flats before use.

A quick basal dip of 3000 ppm IBA is used as a rooting hormone, putting only 25 to 35 cuttings to a flat because of the cutting size. The finished flats then go to the outside full sun mist beds for rooting where bottom heat of 75° to 80°F is supplied. Rooting occurs in about six weeks and can run from 20% to as high as 80% on rare occasions. The rooted cuttings are then hardened off for about a week and then potted. During potting, avoid root pruning and warm weather conditions. We pot one plant to a rose pot which will eventually go to a one gal. can and then to five gal. cans. Production time from cutting to a one gal. can is about 4 months. Rooting the cuttings in a root cube or pots might help at the transplant

stage if your operation and room permits. We have rooted *Mahonia aquifolium* as well.

The tissue culture of mahonias also has its possibilities, but current multiplication of the shoots is poor and inconsistent. Hopefully this is an obstacle we can overcome in the near future.

VOICE: Can you comment on problems with looper worm in the production of mahonias?

DENNIS CONNER: It is a problem — not so much on cuttings as with seedlings. But at Monrovia Nursery we are generally on a preventative program to keep these problems from ever developing.

VOICE: When do you start fertilizing your mahonias?

DENNIS CONNER: We normally do not fertilize any cuttings until after they have developed a root system. But for mahonias, they do not go through an acclimating period before potting. They go from the mist bed right to the potting shed. They tend to go backwards if you hold them too long. Once they get in the potting soil they receive fertilizers, also subsequently during irrigation they get fertilizers. The same with seedlings — they are not fertilized until potting.

ARCTOSTAPHYLOS PROPAGATION

DARA E. EMERY

Santa Barbara Botanic Garden
1212 Mission Canyon Road
Santa Barbara, California 93105

Manzanitas, *Arctostaphylos* species, have been propagated at the Santa Barbara Botanic Garden for several decades. Over the years various treatments have been tried to improve seed germination. None has been very satisfactory. The two methods that have repeatedly given some or even good seed germination are the use of fire and acid.

The seeds of this genus have thick, impermeable nut-like seed coats and seeds of many species also exhibit internal dormancy.

For the fire treatment, after the seed is sown and covered, an additional layer of 3 to 4 in. of dry pine needles or excelsior is added and ignited. When the resulting hot flash fire is finished and the seed bed has cooled, it is watered thoroughly. This treatment should be done outside well away from any