

From Forest Nursery Notes, Winter 2010

36. Propagation protocol for several high elevation California natives. Funston, N.
International Plant Propagators' Society, combined proceedings, 2008, 58:276-278. 2009.

Propagation Protocol for Several High Elevation California Natives[®]

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INTRODUCTION

Cornflower Farms is a wholesale California native plant nursery. It was started in 1981 by Ann Chandler who was at odds with her then boss for propagating California natives. What started in a garage is now on 7 acres, producing over a million plants each year. Besides natives, Cornflower Farms also grows water-wise Mediterranean ornamentals for a growing xeriscaping market in California.

A large part of our business is growing for revegetation purposes. We work with developers, government agencies, parks, and landscapers on many different types of restoration projects ranging from riparian mitigation to coastal restoration or rare plant salvaging. We've grown plants for Glacier Point, Yosemite, and for retention ponds for the local utility company.

But, since this is "Propagation with an Altitude," this talk will lightly touch on how we propagate several high elevation species that are always in demand.

PROPAGATION PROTOCOLS

***Arctostaphylos patula* (greenleaf manzanita) and *Arctostaphylos nevadense* (pinemat manzanita).** *Arctostaphylos patula* is an upright, large-leaved manzanita. Greenleaf manzanita is the most common manzanita in the Great Basin and much of the Sierra Nevada. It occurs from Washington south to California and Baja California, east to New Mexico, and north to Montana, at elevations ranging from 2000 to 9000 ft. It grows from 3 to 7 ft and may spread to 10 ft.

We grow this plant from cuttings. We take the cuttings after the snow has fallen, generally in November. We seem to get better success if the roots have had snow on them for several weeks. We take tip cuttings of the current year's growth. Because there are often blind buds, the cuttings have 4 nodes to increase chances of a cutting with a good bud. The cuttings are approximately 4 inches long and are wounded at the base. A wound is a thin, 1 inch strip of cambium removed. They are treated with #8 Hormex and put in a 17 inch × 18 inch flat with 260 cuttings in a flat of perlite and peat moss. The cuttings are put on bottom heat with low mist.

Arctostaphylos nevadense is a low-growing, mat-forming manzanita. The branches will form adventitious roots in the soil. It is a good plant for slope stabilizations but it is hard to get established. It grows to 1 ft or so and spreads up to 8 ft. Pinemat manzanita is distributed from the Cascade Range in Washington, south through the North Coast Ranges and the Sierra Nevada of California and east to the Blue Mountains of Washington and Oregon at elevations from 5,000 to 10,000 ft.

We also propagate this plant from cuttings. We take the cuttings just before the first snow. Once it snows, it's hard to find the plants and is a lot of work to uncover them. These cuttings are also from the current years growth. The cuttings are 2–2.5 inch and also treated with #8 Hormex. We place 280 cuttings in a flat and these also need bottom heat and low mist.

For both species, the cuttings prefer a cold greenhouse but with bottom heat. They generally have a low rooting percentage and a high mortality rate. Some years we get 40% to 50% and other years 10%. We haven't figured out why. We've experimented with several things. Applications of an aqueous ammonia sanitizer labeled for greenhouse cuttings did not make any difference, positive or negative, in rooting or survival. Applying fungicides, such as Heritage, have also proven ineffective.

The cuttings generally take 4 to 5 months to root. After rooting, they are moved outside to harden off and then are transplanted as soon as possible to minimize damage to the roots.

After rooting, we transplant the cuttings into a 2.25 inch square \times 5 inch deep treeband. We dip the rooted cuttings into a Rootshield® solution. This has helped minimize the transplant shock and maximize survival. Once the container is rooted, the plants are ready to be sold.

***Ceanothus velutinus* (tobacco brush) and *Ceanothus cordulatus* (white-thorn).** *Ceanothus velutinus* is an erect shrub that often grows in dense thickets. From 2 to 6 ft tall, and spreading; thickets can be up to 30 ft wide. *Ceanothus velutinus* is found at elevation from 1500 to 13000 ft, in the western states.

Ceanothus cordulatus is an erect-to-spreading shrub from 2 to 5 ft tall. It grows at elevations from 1500 to 10,000 ft in the Coast and Cascade ranges of Oregon, most mountain ranges of California, Western Nevada, and Baja California.

Ceanothus seeds have a very hard, impermeable seedcoat that must be cracked, abraded, or exposed to heat in order for germination to occur. We put the seeds in hot water (~180 °F) and let them soak for 24 hr. Then we drain the water and stratify the seeds in perlite at 40–44 °F. After a few months the seeds start to germinate and we sow them directly into containers, using either Leach Tubes or treebands, because the roots are sensitive to transplanting.

***Sambucus racemosa* and *Sambucus caerulea* (elderberry).** Red elderberry is a native deciduous shrub that grows throughout most of the U.S.A. Size varies from 2 to 20 ft. In the Sierra Nevada, they usually stay under 6 ft. It produces bright red berries that are very attractive in the landscape.

Blue elderberry is also a deciduous shrub/tree that grows from 4000 to 10000 ft. It is similar in habit and form to the *S. racemosa*. It produces dark-blue berries covered with a fine, white powder.

For both species, the berries are collected when ripe and macerated to extract the seeds. The pulp and void seeds are floated off in water. The viable seeds sink in water and are collected and dried.

Like *Ceanothus*, the seeds are put in hot water to soak for 24 h. The water is drained and the seeds are stratified in perlite at 40–44 °F. The seeds are monitored for germination and any possible fungal infections. When germination is observed, the seeds are sown in a seedflat of perlite/peat moss and covered with a layer of 6 \times 12 gravel. Once the seedlings have two sets of true leaves, they are transplanted into containers.

Pests that we have to worry about with *Sambucus* are spider mites, leaf spot, and botrytis. Good fertilization usually keeps the mites away and spacing out the plants helps prevent botrytis. We see leafspot start in September if we're using a lot of overhead irrigation so we cut down on that.

***Purshia tridentata* (bitterbrush).** *Purshia tridentata* is low and spreading, typically about 6 ft wide and 3 ft high with many horizontal and even prostrate, gray stems. It is common throughout the western U.S.A. and it is a pioneering species on steep, rocky, unstable disturbances. We propagate *Purshia* by seed. In March, the seed is soaked in hydrogen peroxide for 5 h and then flat-sown. Germination is satisfactory. The hydrogen peroxide needs to be fresh or germination will be poor. We usually transplant these seedlings into Leach tubes once there is one set of true leaves. *Purshia* seedlings tend to stunt if they sit in the seedflat for too long, but if transplanted as soon as there is a set of true leaves, they grow better. Once transplanted, they are fairly fast to root out but the tops remain fairly small compared to the *Artemisia* and *Chrysothamnus* of the same age and container size. When grown in containers, they have to be watered very infrequently but thoroughly; they will rapidly die if kept too wet.

***Prunus emarginata* (bitter cherry).** Bitter cherry is native to western North America, from British Columbia south to California, and east to western Wyoming and Arizona. It is often found in recently disturbed areas, open woods, on nutrient-rich soil. It is a deciduous shrub or small tree growing to 3–50 ft tall with a slender oval trunk and smooth gray to reddish-brown bark.

We treat this seed by leaching in water for 8 days. Then the seed is drained and stratified in perlite for up to 5 months. When germination is observed, the seeds are sown in a flat and then seedlings are transplanted when they have a set of true leaves.

We haven't observed many pests on this plant, but they can be hard to maintain through the winter at the nursery when it is too warm and too wet, compared to their native habitat. The roots will rot.