

# PROPAGATION OF NATIVE PLANTS FOR THE WESTERN STATES

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There are a vast array of plant communities within the western states. Plant communities within this region are diverse, ranging from the great basin plateaus, to the mountain coniferous forests, to foothill woodlands with their oak parklands and spring wildflowers, and to the riparian wetlands. Each plant community within these areas have specific requirements for soil type, nutrition, moisture, and reproduction. Discovering the specific requirements for each native species can challenge the propagator. It is particularly valuable for the propagator to visit these native plant communities and become an open observer of all the interacting forces of nature in order to better understand the requirements of each plant.

Propagation of natives can be valuable for several reasons. One is to restore disrupted sites, caused by natural disasters or by human development, to its natural condition so that wildlife can continue to be supported in that area. Another is the value of ornamental native species that enhance our variety of landscape material selections. While offering year-round displays in color and form, other reasons to plant natives include low water requirements, the ability to recreate natural settings in order to draw wildlife into small urban landscapes, as well as offering hardy low maintenance landscapes for large scapes such as large commercial developments and highway plantings.

Propagation can be done from hardwood, semi-hardwood, or softwood cuttings, or from seed. Material being propagated for a specific revegetation project is preferably taken from site specific collections of either the seed or cuttings. Hiking through your collection areas in the spring when the plants are in bloom allows one to make mental or written notes for collection the following fall.

## SEED COLLECTION METHODS

Timing in seed collection is important in order to catch the seed when it is in its prime but before it becomes dispersed. Every year offers new surprises, from plants that have not borne in recent years to discoveries along the trail such as Indian grinding rocks set below ancient oaks, to those hidden "leaves of three," poison oak, *Rhus diversiloba*.

The proper conditions to collect seed vary considerably. The pods of redbud, *Cercis occidentalis*, need to be dry but remain on the shrub so collection is easier. The seed clusters on the blue elderberry, *Sambucus caerulea*, will develop at different times on the same bush. Those for collection should be deep blue with the white coating forming on the clusters to the point that they are beginning to slightly lose moisture. The snowdrop bush, *Styrax officinalis* var. *californicus*, will form a fleshy coating over a large, hard seed. This seed should be collected when the coating is just beginning to split at the bottom but before the seed falls out. The seed should then be dried on screens and the outer shell removed. The Western dogwood, *Cornus nuttallii*, forms a cluster of drupes with interior stones. The completeness of pollination of these clusters will vary from tree to tree. It always seems that the largest cluster of seeds are always on the tallest branch hanging over a near-vertical grade. If you are on a trail several miles in, you are not likely to be carrying pole pruners. This is when on the trail “creativity” comes in. A medium sized rock can be covered with a piece of fabric and tied to a thin rope and tossed over the overhanging branch so the rock circles and catches on the branch. The branch can then be gently pulled into your reach, seeds collected, the rope slackened, and the branch released.

#### SMALL BATCH SEED CLEANING METHODS

Basic tools for cleaning seed can be found in most households and consist of: a selection of bowls, food processor or blender, window screens, straws, plastic bags, hair dryer, colanders, and strainers. Nothing too elaborate is needed for cleaning small batches—just a good imagination. Seed is first correctly identified and then assigned a record number by which to track them through all stages of cleaning, stratification, sowing, etc. Seeds with a fleshy exterior and small seeds inside, such as *Sambucus* spp. or *Vitis* spp. can be pureed in either a blender or a food processor. This is then put into a tall container and filled with water to separate the non-viable seeds and pulp, which float on the surface, from the viable seed, which sinks to the bottom. With several decantings you can end up with clean seed that is ready to go into stratification. Fleshy seeds with a larger seed such as *Rhamnus* spp. or *Cornus* spp. can be fermented in water then cleaned by rubbing against a coarse meshed sieve to remove the outer pulp. Some seeds need after-drying so the capsules will dehisce, letting out the seed. These are placed into paper bags, labeled, and allowed to sit at room temperature until they are dry. Some seed such as *Alnus rhombifolia*, *Carpenteria californica*, and *Heuchera* spp. will open and the seed can be collected from the bottom of the bag. Others

such as *Ceanothus* spp. *Heteromeles* berries, *Fremontodendron* spp. and *Rosa californica* need to be opened physically and the seed separated with a blower, water separation, or screens to remove the chaff from the seed. A simple box lined with ribbed non-skid rubber matting on the bottom and a covered hand-held block works well for most seeds to crush the seed pods apart. The entire crushed contents can be put into a bowl and a hairdryer (set on cool) can be used to carefully separate the chaff from the seed. It is advisable to put a tarp below the bowl to check that the seeds are not being thrown out.

### AFTER TREATMENTS AND STORAGE OF SEEDS

Some seeds such as *Heteromeles arbutifolia* are ready to be directly sown. Others may need a 30 to 60 day stratification period at 35 ° to 40 °F. Information on various seeds can be found in several source books, such as *Seeds of Woody Plants in the United States*, USDA, Forest Service. 1974 Agricultural Handbook No. 450. Sometimes no information can be found so you have to think about what natural conditions do to the plant and try to artificially create those conditions. Those that need treatment are either soaked overnight in warm water, given a hot water treatment, or an acid soak if it has an impermeable seed coat, such as *Arctostaphylos* species. Seeds are then mixed with medium grade perlite in a 50/50 ratio. Then moisture is added (but not until it is soggy) and put into a plastic bag. The bag is closed off with a straw so that the seed is vented to the atmosphere. They are then put into a refrigerator for the required amount of time. The bags should be checked every couple of weeks to check the moisture, watch for mold, and to look for the emergence of the radical. They can be directly sown into individual containers or into seed flats at this time, depending on the size and character of the seed.

### CUTTING PRODUCTION

Cutting stock can be taken from on-site mother beds or in the wild. You have more control of the vigor of the tissue if it is taken from your own mother beds. Using *Ceanothus* as a general example for natives, we take a basic 3-in. cutting with the lower inch stripped and a node included. It is rinsed in a 2 to 5% chlorine/water bath. The very bottom of the cutting is then dipped into a commercial hormone. (Hormodin #3) It is then stuck into a cutting flat that has a 90% perlite and 10% peat medium. The mix being high in perlite is important because most roots of most natives need good aeration and drainage in the rootzone to keep them from rotting, especially when being put under intermittent mist. The bottom of the stuck

cutting should be kept about an inch from the bottom of the flat to keep it out of the water saturation zone. A definite sign that they are too deep is when you see the bottom ½ in. of the cutting rotting off and the roots developing above it. The spacing between cuttings of native plants is important and should be adjusted for each species, taking into consideration their leaf size and form in order to maintain good aeration within the flat.

### GROWING CONDITIONS

Every greenhouse has a different environment overall and many micro climates within the same house. You need to become aware of these and what each species need. Selection of our propagation house was important. Growing predominately native and drought tolerant species, we looked for a house that was tall and had good circulation with minimal problems of condensation drip. The overhead fact fan is kept running at all times except when the exhaust fans are on. The holes are kept in the 10 o'clock and 2 o'clock position so the air will circle down the sides of the plastic and reduce the condensation. The double poly covering and the type of plastic affect the interior conditions. We are currently using Monsanto "Cloud Nine" poly which seems to diffuse the light differently and not be as harsh on the newly stuck cuttings.

Our benches were constructed at ground level so we can conserve our bottom heat and give more air space above the cutting. Each bench is insulated with 2 in. styrofoam on the bottom and 1 in. on the sides. The mist heads arise from the bottom of the bench so there are no problems associated with an overhead drip line. Each table has its own zone on the mist timer so it can be customized for the plants placed upon it. The time and intervals of the mist is watched daily in order to make changes due to temperature and daylength. The mist turns off by the afternoon so that the tops of the plants can dry before night, thereby reducing fungal problems. If the water conditions are kept balanced you will eliminate the need to do costly drenches.

### TRANSPLANTING

When the cuttings or the seedlings are ready to be transplanted we use different containers depending where the plant is going to be planted. Those used for transplanting into 1 gallons are potted into rose pots so that they can adapt to other nurseries planting systems. Those going to be outplanted in a revegetation planting will use containers whose root systems are deeper and have ribs that guide the roots down to the bottom drain holes where root pruning occurs. The liners are all grown on raised open benches or raised tube racks in order to get the maximum air pruning and drainage. The finished product is then shipped out to be planted into containers or sent to a revegetation site where it is planted back into the wild.