

## Wild Things: Propagating Lesser-Known California Natives<sup>®</sup>

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### INTRODUCTION

It has taken many years and it has involved several false starts, but California's native plants are finally joining the horticultural mainstream. The process began long ago with a few trees, mostly oaks, pines, and redwoods, and two shrubby genera, *Arctostaphylos* and *Ceanothus*. Recently it has encompassed a much wider range of plant genera and even plant types, including a number of herbaceous perennials and even a few bulbs.

Those of us who would like to take part in this evolving market will encounter a new set of interesting challenges for nursery culture and propagation, calling for a combination of creative thought, careful observation, and patient experimentation. The novel factors have to do with the plants' adaptations to an almost overwhelmingly wide range of natural conditions, all of them distinct from those of more familiar ornamentals.

First, there's geography: our state spans several hundred miles, with a dramatic increase in precipitation as one moves from south to north. Elevations range from below sea level to over 14,000 ft, crossing several climate zones, while the effects of mountains and valleys, coastal bluffs and plains create an almost overwhelming array of distinct plant habitats. Overlaid on these features of the land is a Mediterranean climate pattern, generally distinguished by cool, moist winters and warm, dry summers. And there's more — most notably the historic role of periodic fires in renewing natural communities.

Among the resulting plant adaptations, there are several of special interest to propagators. These include seasons of peak activity that are sometimes nearly opposite to those of more familiar Asian and Eastern American plants. Some species, notably bulbous and cormous perennials, even exhibit non-negotiable summer dormancies, brought on by warming temperatures, drought, or both. Many of the mountain dwellers have both cold-stimulated dormancies and specific cold requirements for the germination of seeds and they often show a marked intolerance to winter moisture. Coastal natives, on the other hand, are often more adaptable and opportunistic, maintaining active growth year-round in cultivation. For many plants of fire-renewed communities, there are hard, dense seed coats that need physical or chemical abrasion to permit absorption of water. And there are the quirks of individual plant species, all to be discovered one by one. Dealing with these as propagators involves building some interesting bags of tricks. In our case these range from the planting of seeds and cuttings in an open shade house during fall and winter to the use of solvents to dissolve waxes in the seed coats of some species of the fire chaparral. One of our more exotic tools, also for plants from the fire chaparral, has been soaking the seeds in a commercial smoke extract, coated on disks of filter paper and available from Kirstenbosch Botanic Gardens or a company called FineBushPeople in South Africa.

## SOME EXAMPLES

Having discussed our work on the two most popular native genera, *Arctostaphylos* and *Ceanothus*, last year at the Denver conference, I would like to turn to several lesser-known, but increasingly popular, native shrubs.

***Artemisia*.** The shrubby artemisias, or sagebrushes, though mostly dryland and mountain plants, have been surprisingly easy to handle in the nursery. Their extreme variability in the wild invites selection of superior individuals and makes simple cuttings our propagating method of choice. We take our cuttings near the tips of actively growing shoots, discarding the softer tip portions and seeking a firm base. Only moderate rooting hormones (0.3%–0.8% IBA in a talcum base) are necessary and bottom heat seems necessary only in winter. Their intolerance of excessive moisture is a complicating factor, which we address by placing them in a relatively warm, dry but shaded greenhouse dedicated to plants of similar preferences. Rooting generally occurs in 1–2 months.

Our treatment of seeds depends greatly on origin. We routinely refrigerate those of high-mountain species, like *A. arbuscula*, for 1–2 months, but simply sow those of coastal species in an open shade house in fall or early winter, allowing cool nights and occasional freezes to satisfy their pre-germination requirements. They sprout in late winter or early spring. Viability of the seeds is often low, but many plants produce prodigious quantities, so we tend to sow heavily.

***Carpenteria californica*.** The bush anemone is easy to grow as a mature plant, but often frustrating for the propagator. Cuttings are not difficult to root but have some puzzling problems along the way. We usually take them from actively growing shoots (normally in summer), using portions far enough behind the tips to permit a “firm” (semi-mature) base. Only moderate hormone concentrations are required (0.3–0.8% IBA). However, regardless of the maturity, health, or size of the cut portions, the basal node, or basal end of the cut stem where internodal cuttings are tried, shrivels progressively, leading to slow decline and eventual death of the cutting.

Seeding is not technically difficult, but the seeds are tiny and need to be mixed with sand or similar material to permit reasonably even distribution. We barely cover them, place them in a shaded, humid setting, and keep them constantly moist; a single accidental drying of the surface may halt germination. However, damping-off is a frequent problem, compounded by the sensitivity of the delicate seedlings to many fungicides.

***Cercis occidentalis*.** Our western redbud is a far more “propagator-friendly” plant. We grow it primarily from seeds, always from selected parent stock. Plants are highly variable in the wild, and we choose our “seed mamas” for attractive plant habit and dark flower color. Like those of many shrubby legumes, seeds of western redbud have hard, dense seed coats and respond well to immersion in hot (not quite boiling) water and an overnight soak after the water has cooled. Germination also seems to be improved by adding the FineBushPeople smoke extract described above to the soak. The seeds are sown outside in January or February and germinate as the weather warms. Stratifying in a moist peat-perlite propagation mix permits us to stage multiple crops more easily.

We have successfully propagated superior individuals by summer cuttings, using near-tip portions of strongly growing shoots, using mild rooting hormones (0.3% IBA powder), and mist to prevent dehydration.

***Chrysothamnus nauseosus* subsp. *albicaulis*.** This plant is a smallish, white-foliaged and golden-flowered form of the common rabbit brush and is one of the great floral spectacles of our mountains, our particular plants hailing from the high Sierra. We grow them almost exclusively from seeds. These are sometimes of low viability, but are produced in vast quantities. The seeds are cold-stratified for about 2 months in moist perlite in winter, then planted outdoors as the weather warms in spring. Though cuttings have rooted poorly for us, I suspect that this is a matter of failing to take them in strong vegetative growth, before flower buds are set. We have been quite successful with another species, *C. viscidiflorus*.

***Dendromecon rigida* and *Dendromecon harfordii*.** Our native bush poppies are reputed to be extremely difficult to propagate. In the case of their seeds, this is due primarily to the combination of a hard, dense seed coat with an almost shellac-like outer layer of wax, making them impermeable to water without physical or chemical damage. We have found a three-step treatment to be highly successful. The wax is dissolved with white gasoline or charcoal starter fluid. This is drained and dissipated by evaporation, then rinsing with water, and followed by an overnight soak in the FineBushPeople smoke extract. The seeds seem to germinate in a wide range of temperatures, though our best results have been by sowing them in outdoor shade during winter, shielding the flats from excess moisture with a small "rain roof" structure.

Cuttings are fairly easy when taken from young (less than 1 year) plants, especially if these are grown in shade. They become progressively more difficult to root as the plants mature and are subjected to higher exposure and drought stress. We use active shoot tips with a fairly firm base and only use moderate rooting hormones (0.3%–0.8% IBA). Mist may be necessary to avoid shriveling, though we can usually accomplish this with a humid, shady setting, thus minimizing disease.

***Eriogonum*.** Wild buckwheat is an extremely diverse group, found from the sea-coast to our highest mountains and even deserts. Yet most can be successfully propagated under nursery conditions.

Seeds generally have high viability when fresh and germinate without any special treatment. We routinely cold-stratify those of the high-mountain species for a month or two, but even this is often unnecessary. Most are sown outdoors in late winter and moved to a warm, relatively dry greenhouse following germination to minimize damping-off.

It was once widely believed that stem cuttings of most species were difficult, but we have found this not to be the case, even with the matting montane species. We take them just as a wave of growth matures, using mostly shoot tips with a firm base. Cuttings of some of the matting types can be quite small. They are treated with mild rooting hormones (mostly 0.3% IBA) and placed in the dry but shaded greenhouse setting described above.

***Heteromeles arbutifolia*.** The California toyon, is an extremely showy native shrub with a largely undeserved reputation for difficulty.

Its scarlet berries provide one of the great winter spectacles of the California out-back, as well as our primary means of propagation. I long ago stumbled on two wild populations of plants that were generally superior in every ornamental respect. The number of individuals we use have narrowed over time as we tracked the qualities of their offspring. The berries ripen quite slowly and are usually collected around

the New Year. At this point the seeds are still somewhat soft, while the skins of the berries are hard and tough. To make them easier to handle, we place them in large pans, barely cover them with water, and allow them to ferment for a few weeks. Then a combination of gentle mashing and rinsing makes it possible to float off skins and pulp, while the heavier seeds stay behind. Part of the seeds are planted outdoors immediately, where they germinate in 1–2 months with the assistance of a short natural chill. The rest is moist-stratified for up to 3 months to allow staging of the crop. Once sprouted, all flats are moved into a warm, relatively dry greenhouse to minimize damping-off and other diseases.

It is also quite feasible to produce toyons by cuttings and the discovery of markedly superior individuals makes this worthwhile. We take cuttings throughout the growing season (roughly April to October), rooting them on bottom heat with misting only until callus is well developed (the leaves are large and subject to dehydration, but also subject to disease in overly moist conditions). Use of IBA powder at around 0.8% serves nicely for rooting. Our initial cuttings for selections in the wild are usually taken in winter, when the plants are relieved of drought stress. These are well-matured, pre-stressed shoots and require stronger rooting hormones, usually in liquid form. Rooting can take from 2–4 months, sometimes longer for cuttings from the wild.

***Lupinus.*** The shrubby lupines are dazzling wildflowers, but they have only recently become popular as subjects for the native garden. We have experimented with them for many years and have found them far easier to propagate than their reputation suggests.

Most plants are grown from seeds, collected mostly in the nursery now that we have succeeded in developing superior seed strains. The pods are explosive, actually flinging seeds in all directions as they rupture, so we harvest them before they dry. Like *Cercis* and many other shrubby legumes, the lupines have hard, waxy seed coats that are most easily softened and made permeable by immersion in hot water. An additional overnight soak in the FineBushPeople smoke solution seems to improve germination for species of the dry interior chaparral. All seeds are sown in our open shade house during the cooler months and germinate after a month's (or less) mild chill. They grow quite strongly and will produce salable 1-gal plants in as little as 6 months.

Shrubby lupines are also not difficult to root as cuttings, although there are clearly some obstacles to large-scale use of this technique. First is their susceptibility to botrytis and other fungal diseases under moist, crowded conditions; this is remedied, at least in part, by carrying them on in a shaded but warm, relatively dry greenhouse. A second problem, however, is more mysterious. Often the cuttings, whether soft or mature, will begin to shrivel at the base within the first month, then decline slowly and die, much in the manner described for *Carpenteria*, above. At other times we obtain good stands, which grow as strongly as seedlings into saleable crops.

***Malacothamnus.*** The bush mallows, are a showy group of mostly chaparral shrubs only recently gaining notice in horticulture. For the propagator, they provide some welcome relief from the challenges of other dryland natives. Having made and received from friends some outstanding clones of a few species, we propagate them primarily by cuttings. These will root quickly with only mild or quite

likely no rooting hormones, given moderate bottom heat. However, most will not tolerate extended periods of mist, though it is sometimes necessary for a few weeks to avoid dehydration of the large leaves. Our solution, as for some other groups just discussed, is a shaded spot in a relatively warm, dry greenhouse.

Another vegetative technique, because the plants are rhizomatous (sometimes quite prolifically so), is simple digging and planting of volunteer shoots — essentially division. In most cases, this will probably not yield quantities sufficient for the commercial grower, though it is quite satisfactory for the homeowner.

Seeding can be problematic for an unexpected reason: many plants, and sometimes whole populations (which may be made up of only a single far-ranging clone), simply don't set seeds, at least most of the time. In diverse populations where seeds are available in quantity, they prove to be quite easy to germinate. We plant them outdoors in fall or winter and they sprout as the weather warms in early spring. It may well be that even this mild chill is unnecessary, as it is for many other western mallows. In any case, the plants grow at an impressive pace and will make salable plants in 1-gal or larger containers during the same season.

**Ribes.** Our flowering currants and gooseberries would appear in many respects to be two different genera. Both subgroups are fairly easy to propagate, but they have slightly different quirks.

We grow our own and various friends' selections from the wild and thus are primarily interested in cutting propagation. We began with rather rigid adherence to fall propagation of well-matured shoots for *R. sanguineum* (red-flowered currant) and other large-leaved currants, then found that near-tip portions of actively growing shoots could be propagated successfully nearly throughout the growing season (for us, April to October). The critical element has been to avoid dehydration of their large, soft leaves, while applying only the minimum misting required (generally none, once callusing has taken place) in order to avoid botrytis, pythium, and other diseases. Only mild rooting hormones (for example, 0.3% IBA powder) are desirable.

Some of the gooseberries (the spiny, smaller-leaved species) have distinct summer dormancies, growing primarily in winter and early spring. We do our cuttings of these mostly in open shade during late fall and winter. They usually form roots within 2–3 months under these conditions without bottom heat.

Seeding has been of only minor interest to us, given our focus on selected traits, but we discovered quite accidentally, first with *R. speciosum*, the fuchsia-flowering gooseberry, just how easy this technique can be. Wherever ripe berries drop around the plants in summer, swarms of volunteer seedlings appear after a short winter chill. We now use outdoor fall and winter seeding successfully for any species collected as berries in the wild, giving a couple of months' moist stratification to seeds of high-mountain species.

**Salvia taxa.** California's shrubby sages have gone from obscure novelties to popular garden plants — especially in coastal gardens — in only a couple of decades. Now we find ourselves producing several crops each year of some species and cultivars and, in the process, finding ways to extend the propagating season.

Most of our salvias are accidental garden (mostly botanic garden) hybrids, selected and maintained as individual cultivars. These are propagated by cuttings, which root quickly and easily, with or without bottom heat and with only mild rooting hormones (0.3% IBA in a talc base is standard). However, they are not without

their challenges, which center on avoiding dehydration while discouraging *Botrytis* and several other major fungal pathogens. We can serve both ends by placing the cuttings either outdoors, in open shade, or in a shaded portion of the same dry greenhouse already described. In our coastal climate, misting nearly guarantees a constant battle with disease. We also enforce a “luxury” level of spacing between cuttings, avoiding overlapping (and thus moisture-trapping) leaves.

Seeding is not difficult, and it is our primary method for the shrubby *S. apiana* and a semi-woody perennial, *S. spathacea*. Here, again, disease is the primary obstacle. We sow our seeds outdoors during the cooler months, providing a mild chill and dress them with a thin layer of coarse sand to discourage damping-off. Once sprouted, they are usually brought into a dry greenhouse, where moisture can be carefully controlled.

***Styrax officinalis* var. *redivivus*.** Our snowdrop bush is a lovely shrub with some irritating quirks for the propagator. We produce crops largely by seeding and the seeds sprout reliably during winter and early spring outdoors. However, their large, fleshy cotyledons insist on lying flat against the surface of the seeding medium, trapping moisture and frequently being invaded by *Pythium*. Sowing the seeds individually in 2-in. pots and dressing them with coarse sand has helped considerably, but we will try a gravel dressing and preventive fungicidal drenches in the coming season in the hopes of even better results. That said, the seedlings grow strongly and become much easier to handle once the cotyledons are shed (I have even considered trimming these off, once the first few true leaves are produced).

Summer cuttings provide a less troublesome route to new crops. We find that the plants must be growing vigorously and that we must use near-tip portions of the most active shoots. We use only moderate rooting hormones (0.8% IBA) and bottom heat. Mist is generally necessary only until the cuttings form callus. Rooting normally takes place in 2–3 months.

***Trichostema lanatum*.** Woolly blue curls is a small shrubby mint that both gardeners and nursery folk simultaneously love and hate. It is spectacularly beautiful in flower, sometimes deceptively easy to propagate and grow, and notoriously unpredictable.

We have not done particularly well with seeds, though they are not technically difficult to germinate. I suspect that the addition of an extended soak in smoke extract to our customary initial immersion in hot water and outdoor sowing in fall and winter would improve the “take.” Perhaps the winter chill is unnecessary. In any case, this is a work in progress.

Cuttings of tip and near-tip portions of strong summer shoots are easy to root, though major losses to disease are always possible. We are meticulous about the health of our propagating material, and about the control of moisture (accomplished through the use of the same warm, dry, shady greenhouse setting already described). Only mild rooting hormones (if any) are necessary, and rooting can be quite rapid. However, overwintering of the resulting plants in either 2-in. pots or 1-gal cans can be a vexing challenge. Ideally they should be shielded from both heavy rains and frost. We have lost whole crops to sudden winter freezes, in spite of the impressive hardiness of mature plants.