

Propagation.1d: Seed Fire and Heat Treatments (Part 2—Hot Water Treatment)

Ron Allen, Native Plant Gardening Chair, CNPS Central Sierra Chapter

The hot water treatment propagation technique uses a bath of near-boiling water to break the dormancy of California native plant seeds. Plants amenable to hot water treatment are those species whose adaptation to our state's Mediterranean climate and associated fire regime relies on the heat, but not necessarily the chemistry of smoke or residual *charate* (burned plant material) from a fire. There are many such *fire-follower* plants in California, including many in the *Ceanothus* and *Lupinus* genera. This article explains the technique using the example of Western Redbud (*Cercis occidentalis*).

1 Procedure

Western Redbud is a popular native California shrub or small tree. It is widespread in the Central Sierra up to 4,500 feet, accepts full or partial sun, requires no summer water, and has beautiful magenta flowers in the early spring.

Hot water treatment is explained in Dara Emery's book on seed propagation of California natives.[1]

1.1 Seed collection

- a. The cool thing about *Cercis occidentalis* seeds is that whenever you want them, you can get them pretty much from the closest plant; you don't need to wait until autumn.
- b. The seeds are in pods, resembling snow pea pods like you'd buy in the grocery store. (The Redbuds are in the pea family (Fabaceae) of plants.*) The pods persist on the plant well into the next growth year, but for seed collection, you will look for the old brown pods, not the new green ones; cf. Fig. 1.

1.2 Seed selection

- a. The good news that you can collect Western Redbud seeds any time of the year is shaded by the fact that the older seeds you need are more likely to be penetrated, and rendered unviable, by insects.
- b. Peel the dry pod husks away and collect the seeds inside; cf. Fig. 2. The seeds should be solid, have a lozenge shape (think of snow pea seeds) and be about 1/8-inch in diameter.
- c. There are two culling operations. The first cull is to visually inspect the seeds for damage by chewing insects and holes left by boring insects; cf. Fig. 3.

* The pods are edible and nutritious, since the pea family plants are nitrogen fixers—they produce proteins. One must harvest only new, brightly green, immature, and flexible pods.

- d. Remove the culled seeds from further processing. The second culling operation will happen after the hot water immersion.



Fig. 1. Last year's seed pods (brown) and this year's (April 2026) Western Redbud pods (medium green) on the same tree. We will collect seeds from the brown pods for hot water treatment, leave some of the green pods for next year's propagation, and skim off a few of the soft, flexible green ones for tomorrow's bowl of ramen breakfast. Photo credit: RLA.



Fig. 2. Stripping the pod husk from Western Redbud seeds. Photo credit: RLA.

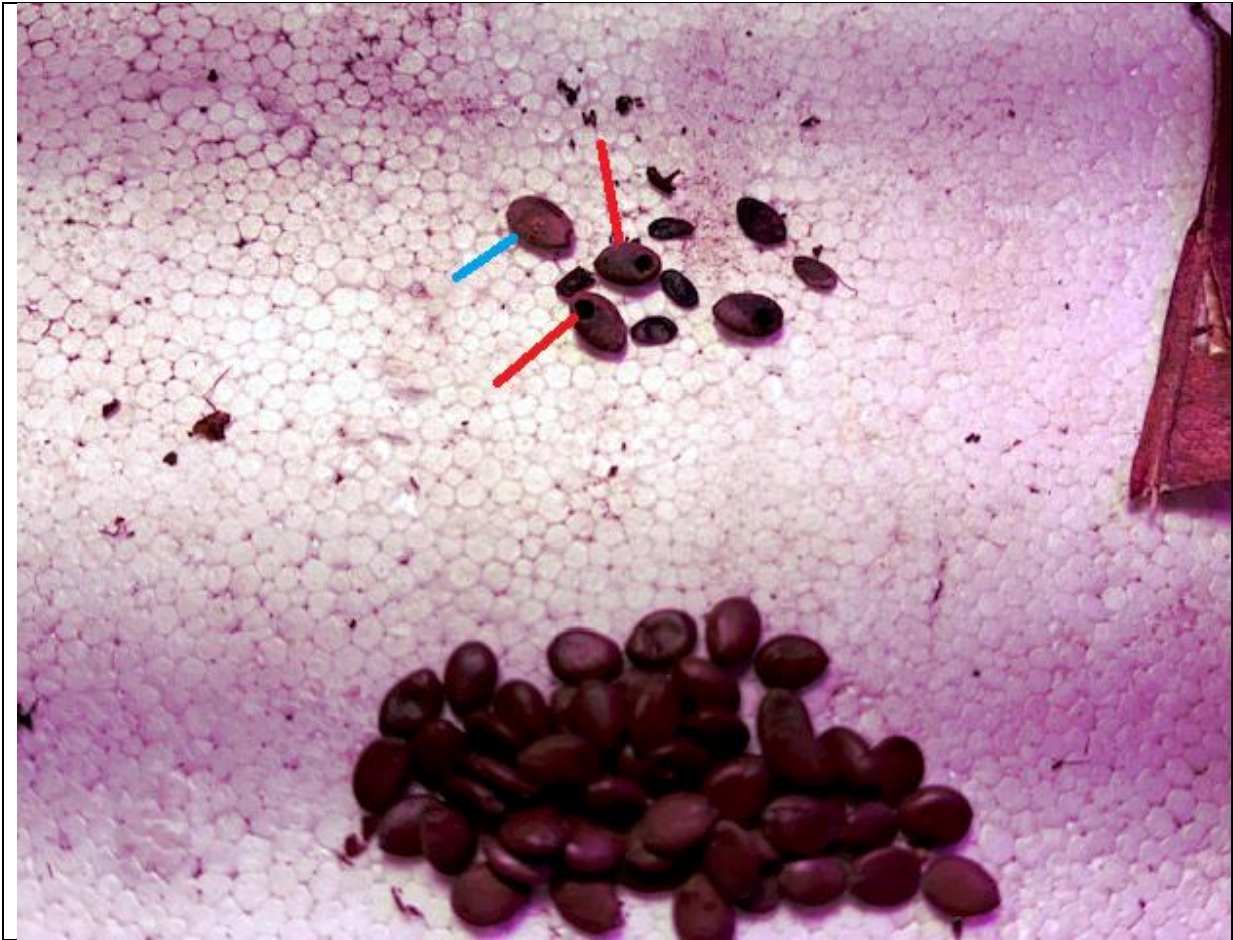


Fig. 3. Initial culling of Western Redbud seeds. The red arrows point to insect bore holes. The blue arrow points to a seed where the coating has been eroded—probably eaten. Photo credit: RLA.

1.3 Hot water immersion

- a. Put the seeds that survived the first culling into a clean hot liquid container: a coffee cup, a Pyrex measuring cup, or a small plastic kitchen storage container.
- b. Heat about 1 cup of tap water to near boiling in a small saucepan on the stove.
- c. Check the water temperature in the pan with a kitchen meat thermometer. Be sure to measure the *water temperature*, not the bottom of the pan. You want the water temperature to be a little over 180° F, which is the target temperature for Western Redbud. If you overheat the water, just let it cool down to just above the target temperature. (This happens quickly; water has high thermal conductivity, and the evaporation process cools it very quickly.)
- d. Pour the hot water over the seeds in the cup when the temperature falls to right around 180° F; cf. Fig. 4. This appears to be a fatal scalding of a plant seed, but some California natives, such as Mountain Whitethorn (*Ceanothus cordulatus*), produce seeds that can withstand temperatures as high as 220° F [2].



Fig. 4. Western Redbud seeds in hot water. Note that the temperature is a little below the target; this cooling happened while I was fussing with my cellphone camera for this shot after the pour. Note also that one of the seeds is floating (red arrow). It is almost certainly compromised. Finally note that we are cooking plant seeds to a *higher temperature than well-done pork*. This is why I was initially freaked out by the hot water treatment procedure. Photo credit: RLA.

- e. Now comes the second culling step. Check for seeds floating on the water surface (Fig. 4 red arrow). Any such seeds are quite likely to have a good portion of their endosperm (stored seed nutrients) eaten or decayed. It's good to poke them with a pointed tool (the probe of the meat thermometer seems to have been made for this) in case there is a clinging air bubble contributing buoyancy. Remove stubborn floaters.
- f. Let the scalded seeds sit in the cooling water for 8-12 hours. Overnight is a good allowance.

1.4 Stratification

- a. The Western Redbud seeds still need a cool, wet stratification—simulating a California winter—before they are ready to plant in soil.
- b. Spread out the seeds on a moistened paper towel, about ½ inch apart. Fold over the paper towel and the seeds inside it into a Petri dish (Fig. 4, left) or a sealable plastic sandwich bag. Put

the stratification container into the butter compartment of your refrigerator. If your butter compartment is full of butter, one of the vegetable bins is a feasible alternative. Don't let it freeze.

- c. The "strat" time for Western Redbud is **8 weeks**. Do not attempt to shorten this period, but doubling or tripling is OK. If you decide to lengthen the "strat" time, be sure to check the seeds every week for the growth of mold, indicated on the paper towel by dark gray or blackish stains spreading from the seeds. If mold is present, remove the container and plant the seeds immediately. Check too for emergent roots. If any are present, plant the seeds immediately.
- d. Remove the stratification container from the refrigerator, unfold the seeds, and plant them in germination containers (preferred) or in the ground. With both pre-treatment steps now complete, the rest of the propagation procedures are the same as for plant seeds that require no pre-treatment. See the first article in the Propagation series.[3]

2 Plants whose seeds need hot water treatment

Table 1 lists California native plants that can be successfully propagated from seed, but that generally require hot water treatment to break seed dormancy. Some such species might require an additional cold stratification as the table specifies. If you have been reading the earlier articles in this series on seed propagation, but have not therein encountered your favorite *Ceanothus* species, then it might be here. This could be a very large table, but I've limited it to plants native to the Central Sierra and some plants from elsewhere which are interesting and useful for local landscapes.

Scientific name:	Common name:	Hot water temperature (° F):	Cold stratify (weeks):	Comment:
<i>Adenostoma fasciculatum</i>	Chamise	180	0	Only for older seeds or those collected off the ground; fresh off the plant require no pre-treatment
<i>Ceanothus arctuatus</i>	Arching Ceanothus	180	12	Uncommon in the western Sierra south to eastern Madera County
<i>Ceanothus cordulatus</i>	Mountain Whitethorn	180	12	Above 4,000 ft. elevation
<i>Ceanothus cuneatus</i>	Buckbrush	180	12	Widespread, tough, adaptable
<i>Ceanothus diversifolius.</i>	Pinemat	180	10	Ponderosa and Sugar Pine forests of the Sierra Nevada; low growing
<i>Ceanothus greggii</i>	Desert Ceanothus	180	10	Southern Sierra east of Fresno and south through coastal mountains to northern Baja California
<i>Ceanothus thyrsiflorus var. griseus</i>	Carmel Ceanothus	212	0	'Yankee Point' Ceanothus, a low-growing groundcover nursery cultivar from this species, does well in the Central Sierra

<i>Ceanothus integrerrimus</i>	Deerbrush	180	11	At higher elevations compared to Buckbrush, <i>C. cuneatus</i>
<i>Ceanothus leucodermis</i>	Chaparral Whitethorn	180	8	Lower elevations in Central Sierra and Coast Ranges south to Baja California
<i>Ceanothus parvifolius</i>	Little Leaf Ceanothus	180	12	Higher mountains in the Sierra Nevada
<i>Ceanothus prostratus</i>	Mahala Mat	212	20	Beneath conifers in the higher elevations of the Sierra Nevada
<i>Ceanothus thyrsiflorus</i>	Blueblossom Ceanothus	180	10	All coastal California; does well in the Central Sierra with some protection from afternoon sun; our local Woollyleaf Ceanothus seems to be closely related (next plant)
<i>Ceanothus tomentosus</i>	Woollyleaf Ceanothus	180	0	Coastal chaparral plant communities from San Diego north to Orange and Riverside Counties; the plants in the Central Sierra formerly classified as <i>C. tomentosus</i> are more closely related to <i>C. thyrsiflorus</i> [4]
<i>Cercis occidentalis</i>	Western Redbud	180	8	Good down to 15° F, but for higher elevations, where temperatures typically reach the single digits, only Eastern Redbud will work: <i>C. canadensis</i> is good to -20° F, but it does require summer water
<i>Fremontodendron californicum</i>	Flannel Bush	180	10	Foothills around the Central Valley and coastal mountains down to Baja California; no hot water treatment gives modest (10-20%) germination
<i>Lupinus spp.</i>	Lupine species	180	0	Fresh seeds: no pre-treatment; stored seeds: hot water
<i>Marah spp.</i>	Wild Cucumber	140	0	In the foothills of the Central Sierra expect <i>M. horrida</i> ; <i>M. fabacea</i> is also present, but is more of a coastal species; north of Amador County <i>M. watsonii</i> is likely
<i>Pickeringia montana</i>	Chaparral Pea	180	4	On the coast from Mendocino south to San Diego Counties; on the eastern side of the Central Valley from Chico south to Mariposa
<i>Rhus integrifolia</i>	Lemonade Berry	180	0	A large bush from San Diego to San Luis Obispo; full sun or partial sun; evergreen; hedgerow applications; works well in Central Sierra

<i>Rhus ovata</i>	Sugar Bush	212	0	Closely related to <i>R. integrifolia</i> , with which it sometimes hybridizes
<i>Rhus trilobata</i> (<i>aromatica</i>)	Sour Berry	180	10	Native Americans made a refreshing cider from the berries. The strong, flexible stems were used for basket frames and cradles
<i>Solanum umbelliferum</i>	Blue Witch Nightshade	180	0	Remove seeds from hot water after one hour

3 Objective

When the pre-treatment steps are done, the Redbud seeds should be planted into potting soil in small germination containers; cf. Fig. 5. Germination takes anywhere from 2 to 4 weeks. If your germinating site is cool (typically below 70° F) or not well-lit (lacking a plant light or a nearby sunny window), then expect a few extra weeks. When the seedlings are about as tall as the germination container, they can be planted in the ground or moved to larger pots.

One final, brief point. When put into the ground, Western Redbud plants do not grow robustly right away; they just sort of survive. Do not fret over this. If the specimen is alive, then you are doing well. After three or four years, however, they really begin to take off, growing two or three feet per year.



Fig. 5. Western Redbud seedling in small germination container (foreground) and year-old plant in one-gallon nursery container. The seedling is ready to transplant. Photo credit: RLA.

4 References

- [1] D. Emery, *Seed Propagation of Native California Plants*, Santa Barbara Botanic Garden, 1988
- [2] <https://www.fs.usda.gov/database/feis/plants/shrub/ceacor/all.html>
- [3] R. Allen, 'Propagation.1a: California Native Plants,' January 2026 article archived on our chapter website under <https://chapters.cnps.org/centralsierra/native-plant-gardens/>
- [4] D.O. Burge, et al., 'Diversification of Ceanothus (Rhamnaceae) in the California Floristic Province,' *International Journal of Plant Sciences*, vol. 172, no. 9, 1137–1164.