

# Germination Guide for Native Seeds

Jan Midgley 10/18/20

**E (easy) - M (moderate ease) - D (difficult)**

**E *Achillea millefolium*** (Common Yarrow) - Asteraceae

Dry store the seeds at 70° over the winter. Sow, cover very lightly. Expose to 70-77° in the day and 60° at night. These temperatures are goals. The warm daytime temperature is the most important one.

**E *Anaphalis margaritacea*** (Pearly Everlasting) - Asteraceae

This species is dioecious. It has male and female plants. You need both to get fertile seeds. The female heads can be recognized when the seeds are ripe by the reflexing of the involucre bracts. The receptacle “sticks its chest out” and displays the pouffy seed fluff. At this point you can easily pluck the seeds from the receptacle. Store dry until the following spring.

After the last frost date, sow these tiny seeds on the soil surface and press in. They need light and 70°. Mist or bottom water. Fall sowing might work, but I think losses would be large.

Germinate in 1-2 weeks.

***Anemone patens var. multifida*** (Pasque Flower) - Ranunculaceae Plant outside **fall** to early spring. Plant on soil surface and cover with a thin layer of sand. Western Native Seed and Prairie Moon Nursery

**M *Antennaria spp.*** (Pussytoes) - Asteraceae

Dioecious. Female heads are taller and skinnier than male heads which look like small heads of cauliflower.

Collect seeds when the pappus is fluffy, June-July.

Store dry at 40° or 70°. The storage accomplishes after-ripening which may be required for germination success in spring.

Sow mid-April in the Front Range (55-65°). Be generous with the pinch of seeds. Barely cover the seeds.

Germinate in 1-2 months. The seedlings are tiny.

Pussy toes also increase by stolons and can be divided. Maintain sod-like sections.

***Aquilegia chrysantha*** (Golden Columbine) - Ranunculaceae

Sow in situ outside in fall after frost.

OR Cold stratify in the fridge for 60 days and sow, cover lightly and expose to 70°.

***Argemone pleiacantha*** (Southwestern Prickly Poppy) - Papaveraceae

Annual to short-lived perennial.

Sow in situ outside in mid to late fall. Cover lightly.

***Argemone polyanthemus*** (Crested Prickly Poppy) - Papaveraceae

Annual to short-lived perennial.

Sow in situ outside in mid to late fall. Cover lightly.

**M *Artemisia frigida*** (Fringed Sage, Prairie Sagewort) -

Asteraceae Collect seeds Sept-Nov. Store dry at 40° or 70° for 6 months.

Sow after last frost date. Cover seeds and try to make sure they do not dry out. Germinate in 1 week.

Vegetative reproduction by cuttings (Feb-May) and by layering.

### ***Asclepias* spp. seed collection and cleaning.**

Collect seeds when the follicles begins to split. Contain the fly-away silks by putting a rubber band around the follicle until you are ready to clean the seeds. Clasp the silks and thumb the seeds off onto a piece of paper on a tray.

If the seeds and silks are already escaping, bundle the entire mass into a paper bag. Add a coin or two and shake very hard for several minutes. Cut a slit in the bottom of the paper bag and shake the seeds out. Thank you Steven S. for this cleaning tip.

**M *Asclepias incarnata*** (Swamp Milkweed) - Apocynaceae

Store seeds dry at 40° for 5-6 months then sow. Cover **very** lightly. Sow at 75-85°  
OR

Cold stratify 30 days. Sow at 75-85°. Cover **very** lightly.

OR

Sow outside in fall.

**M *Asclepias speciosa*** (Showy or Common Milkweed) -

Apocynaceae Sow outside in fall. Cover **very** lightly.

OR

Cold stratify 60 days. Sow, cover **very** lightly.

Germinates best when the temperature is above 80° day/ 60° night.

**M *Asclepias syriaca*** (Common Milkweed) - Apocynaceae

Follow directions for *Asclepias incarnata*.

**M *Asclepias tuberosa*** (Butterflyweed, Orange Milkweed) - Apocynaceae Store the

seeds dry at 40° at least 2 months and no stratification is necessary. Sow when the temperature is above 70°, preferably 80°+ at least part of the day. Cover the seeds **very** lightly to allow light to the seeds. They should germinate in 7-10 days if the temperature is high enough.

**E *Berlandiera lyrata*** (Chocolate Flower) - Asteraceae

Collect when the bracts are very dry and brownish for easy removal of the bracts. Rub

hard on a soil sieve screen to dislodge the bracts.

Store dry at 40°.

Start in late April. Soak the seeds in diluted peroxide (1/2 C. tepid water + 1/4 oz. 3% hydrogen peroxide) for 24 hours. Rinse. Sow in cells or in situ. Cover very lightly for light entry. Leaves emerge in 10 days.

**E *Brickellia eupatorioides*** (False Boneset) - Asteraceae

No pretreatment necessary. Sow at 70°. Cover the seeds very lightly.

**D *Callirhoe involucrata*** (Wine Cups, Purple Poppy Mallow) -

Papaveraceae Scarify with sandpaper and sow in situ in fall.

OR

Pour boiling water over the seeds in a pyrex dish. Let the water cool and soak the seeds 12-24 hours. Sandpaper scarify and try to peel the seed coat off of the seeds. Cold stratify for 1 month. Sow, cover lightly and expose to 70°. Flower the second year.

**D *Calochortus nutallii*** (Sego Lily) - Liliaceae

Sow outside in late fall or early winter, in cells or in situ. Germinate in very cool temperatures. The first above ground shoot will emerge after temperatures warm.

**M *Chamerion angustifolium*** (Fireweed) - Onograceae

Harlequin Garden's propagator and the USFS say no cold stratification is required. Some other sources recommend 60 days of cold before sowing at 70+. I'm voting for no stratification. Past failures may be due to aged seeds. They are only viable in dry storage for 18-24 months (USFS).

Sow after danger of hard frost. If sowing in situ, press into the soil and protect with burlap until they germinate (Prairie Moon Nursery). The seeds need light. If sowing in cells, cover **very** lightly.

Rhizomes of mature plants sprout readily and can bloom within a month (USFS).

**E *Cleome serrulata*** (Rocky Mountain Beeplant) - Capparaceae

Annual.

Direct sow where you want them in the garden fall to late winter.

If they are cold stratified in the fridge a radicle emerges in 3 weeks.

**E *Coreopsis tinctoria*** (Plains Coreopsis) - Asteraceae

Annual.

About 4 weeks after bloom, the inner bracts should be turning brown. If the seeds remove easily, cut the heads into a paper bag. Clean to remove chaff, leaves, receptacles, any extraneous matter.

Store dry at 40°. Viable 3 years or more.

No pretreatment is necessary. Sow fall or spring. Cover **very** lightly to meet the light requirement.

With help from [wildflower.org](http://wildflower.org)

**D *Dalea purpurea*** (Purple Prairie Clover) - Fabaceae

Store seeds dry at 40°.

After the last frost in the spring, sandpaper the seeds. Next put them in a pyrex bowl and pour boiling water over them. Let the water cool and soak the seeds for 24 hours. Roll around in a light dust of inoculant (opt. but helps). Sow in cells or pots. Cover with 1/8" of medium. Expose to 70°.

Seeds can be sown in situ outside. I prefer early spring sowing to fall. The seeds need no cold stratification. After all the pretreatments, press into a prepared surface if you cannot easily cover the seeds lightly.

Rabbit candy.

***Datura wrightii*** (Indian Apple, Sacred Datura) - Solanaceae

In spring after danger of frost is past, soak the seeds for 24 hours, sow the seeds and cover with 1/8" soil. [worldseedssupply.com](http://worldseedssupply.com)

**E *Dieteria bigelovii*** (Bigelow's Tansyaster) - Asteraceae

Store seeds dry at 40 or 70° for 3-6 months before sowing.

Sow seeds at 70°. Cover **very** lightly to meet the light requirement but still retain some moisture around the seeds.

***Engelmannii pinnatifida*** (Engelmann's Daisy) - Asteraceae

Sow in situ in early fall. Press tightly into the soil. The seeds require light to germinate. [wildflower.org](http://wildflower.org)

***Erigeron divergens*** (Spreading Daisy) - Asteraceae

Sow in spring around the last frost date. Seeds require light to germinate. Press them against the soil and do not cover with medium or do so **very** lightly.

***Erigeron speciosus*** (Aspen Daisy) - Asteraceae

Dry store at 40° or 70°.

Surface sow (light requirement) or cover **very** lightly. Expose to 70°.

Should germinate in 1-2 weeks.

**M-D *Eriogonum jamesii*** (James' Buckwheat) - Polygonaceae

When the perianths turn brown or rusty colored, strip the seeds from the heads into a paper bag. Store them at 40°. Long term storage at 70° is detrimental. The radicle of buckwheat seeds is in the pointed tip. It can be damaged by aggressive rubbing on a screen. Rigorous cleaning is not necessary because the seeds can germinate with the tepals attached. About Dec. 1 to Jan. 1, sow the seeds outside (in cells or in situ,

cover with about 1/16" of fine vermiculite and put the cells outside. Germination may occur at 70° or at 40° or anywhere in between.

**M-D *Eriogonum umbellatum*** (Sulfur Flower) - Polygonaceae

Be gentle when cleaning the seeds. The radicle is in the pointed tip.

Store dry at 40° (Storing 6 months at 70° is very detrimental according to Norm Deno.)

Sow outside in late fall. Cover the seeds lightly. To cold stratify in the fridge, you must sow in cells because the radicles emerge irregularly between 2-3 months. Leaves will not emerge until they are darned ready in the spring.

***Euphorbia marginata*** (Snow-on-the-Mountain) - Euphorbiaceae

Annual

In my experience, one month of cold stratification followed by a high germination temperature (up to 86-90° daytime and 68° at night or at least not below 40°) results in good germination. The seeds should be covered to depth whether sown in cells or directly in the ground. If sowing in situ, sow 3 weeks before the last frost. One online source recommends sandpaper scarification and soaking with no stratification. [selectseeds.com](http://selectseeds.com)

**D *Frasera speciosa*** (Monument Plant) - Gentianaceae

Collect seeds August to Sept. Store dry at 70° until January 1. Sow in situ outdoors or cold stratify 4 months and then sow in cells or in situ. This plant is monocarpic. It dies after blooming and fruiting. It can take many years to germinate and 18-28 years to bloom.

**E *Gaillardia aristata*** (Blanketflower) - Asteraceae

No cold stratification is needed. Sow in situ after danger of frost has past in the spring. and press into the soil.

OR

Sow in cells and cover the seeds lightly. Germination can be erratic.

***Gaillardia x grandiflora*** (Blanket Flower) - Asteraceae

(*G. aristata* × *G. pulchella*) Tetraploid with large blooms.

Treat the seeds the same way you would *Gaillardia aristata*.

**M-D *Geranium viscosissimum* var. *incisum*** (Sticky Purple Geranium) -

Geraniaceae Scarification increases germination. If seeds have been air-dried, they are more permeable to water and will require less scarification. [www.wildflower.org](http://www.wildflower.org) Scarify with sandpaper, then soak in hot water for 12 hours. After treatment, plant outside 1/4" deep in fall or in spring after the last frost.

OR

Sow in cells. In spring, about 4 weeks before the last frost, scarify, soak, cold stratify 30 days, sow in cells, cover to depth and put outside in sun.

Transplant into a deep pot and use very well draining soil.

***Glycyrrhiza lepidota*** (Wild Licorice) - Fabaceae

No cold stratification is required, but it will not harm the seeds.

If sowing outside in the fall, do not scarify the seeds. Inoculate the seeds with Rhizobium inoculum (opt.) and cover the seeds well.

If sowing in the spring in situ or in cells, scarify the hard seed coat with sandpaper, inoculate (opt.) the seeds, and cover them well.

[prairiemoon.com](http://prairiemoon.com)

**E *Grindelia subalpina*** (Subalpine Gumweed) - Asteraceae

Super pollinator plant. It is perennial and blooms for months.

Collect the seeds when the involucre bracts are not super sticky. Otherwise the pappus of the seeds will glue the seeds together and to the bracts. The involucre bracts make a cup that is upright, and the seeds remain in the cup for months.

Store dry at 40°.

Sow mid-May. Cover lightly. Germinate within 2 weeks.

**E *Helianthus annuus*** (Common Sunflower) - Asteraceae

Annual.

After danger of frost is past in the spring, sow directly onto the soil where you want the plants. Space the seeds at least 12" apart. Cover with 1/2" of soil

If the temperature is 68-75°, the seeds should germinate in 2 weeks.

**E *Helianthus maximiliana*** (Maximilian Sunflower) - Asteraceae

Store dry at 40 or 70°. Cold stratify 6 weeks before sowing at 70-85°. L=D so use light cover over seeds.

**M *Helianthus pumilus*** (Little Sunflower) - Asteraceae

Once cleaned the seeds may need to go in the freezer for 2 weeks to treat for weevils. Be sure they are very dry first.

Store dry at 40.

Either sow in mid Dec. and put outside for the winter or cold stratify at 40° for 2 months, then sow, cover the seeds lightly.

For 2 years I have not had good germination with fridge stratification. Outside temperature fluctuations may be best.

**M *Heliomeris multiflora*** (Showy Goldeneye) - Asteraceae

Keep seeds dry at 70° for a year to after-ripen. Sow at 70-80°. Cover lightly with soil. OR

Cold stratify fairly fresh seeds for 4-6 weeks. Then sow at 70-80°. Cover lightly.

**E *Heterotheca villosa*** (Hairy False Goldenaster) - Asteraceae

Store seeds dry at 40°. Sow after last frost in situ or in cells. Cover lightly. Expose to

70°+.

**M-D *Iris missouriensis*** (Rocky Mt. Iris) - Iridaceae

Native iris have a deep dormancy that is best tackled with scarification (in this western species) and outdoor stratification.

Sandpaper the seeds. Sow outside in situ or in cells or pots. Cover lightly. Exposure to temperature fluctuations coaxes higher germination percentages than consistent 40° in the fridge.

**E *Liatris punctata*** (Dotted Blazing Star or Gayfeather) - Asteraceae A cold moist stratification of 1-2 months is necessary. Outside stratification in situ or in cells is preferable to seeds in a resealable plastic bag in the fridge because the radicles begin to emerge in 19 days and cotyledon leaves emerge 9 days after that at 65-70°. Use light to medium cover. If you have an indoor grow light array and want to cold stratify in the fridge, it works well.

**E *Linum lewisii*** (Blue Flax) - Linaceae

Blue Flax germinates best when it has big temperature fluctuations before the seeds are exposed to 70°. The easiest way to provide temperature swings is to sow the seeds in early winter either in cells or pots or in situ. Cover lightly. Pile snow on the cells regularly during the winter.

**M *Lupinus sp.*** (Lupine) - Fabaceae

Store seeds dry at 40° or 70°.

Scarify with sandpaper, pour boiling water over the seeds. Let the water cool. Soak for 24 hours.

For fall sowing, perform the above pretreatments. Inoculate with rhizobium legume inoculant (opt.). Sow in situ or in cells, cover the seeds. Cells will stay outside all winter. OR

For spring sowing, perform the pretreatments, cold stratify for 45 days in the fridge. Inoculate with rhizobium legume inoculant (opt.). Sow, cover the seeds, expose to 70°.

If you collect the seeds slightly “green” before they form a hard seed coat, you can sow them immediately, and they will germinate in 10-14 days. They will be sticky and the color will be more tan than green. This has worked on every legume I have tried. It also helps avoid seed predation by insects.

**E *Machaeranthera tanacetifolia*** (Tansyleaf Tansy-Aster) -

Asteraceae Taprooted Annuals or Biennials

Store seeds dry at 40°.

Sow outside fall or spring after the last frost date. No pretreatment is necessary.

Cover very lightly.

Germinate in 8 days, even if temperature is 20° below normal.

Rabbit candy.

**E *Mirabilis multiflora* var. *glandulosa*** (Colorado Four O'Clock) - Nyctaginaceae

Collect the large dark seeds in early Sept. in the Front Range. The persistent bracts enfold the seeds. Put the whole thing into a paper bag. Many of the seeds will fall out of the bracts as they dry. It is fairly easy to remove the rest manually. Store dry at 40°. About March 1, soak the seeds in a peroxide soak for 24 hours (1/2 C. tepid water + 1/4 oz. 3% hydrogen peroxide). Cold stratify for 7-8 weeks. Many of the seeds will extend a radicle at week 7 and will need to be sown if they are in a baggie in the fridge. It might be easier to sow all the seeds in cells or small pots after the peroxide soak, cover to depth and put outside. After the 2 month chilling period, all the seeds will germinate over a 2 week period.

OR

Seeds can be sown in situ in the fall.

**E *Monarda fistulosa* var. *menthifolia*** (Wild Bergamot) - Lamiaceae No pretreatment of seeds is necessary. Sow the seeds in cells, pots or in situ after the last frost date, probably about May 10 on in the Front Range.

Cover the seeds **very** lightly (light requirement). They germinate in 10-14 days.

**E *Oenothera albicaulis*** (Whitest Evening Primrose) - Onagraceae

Annual

No pretreatment of the seeds is necessary. Sow when the temperature is consistently close to 70°. They require dark so cover them well.

**M *Oenothera caespitosa*** (Tufted Evening Primrose) - Onagraceae Collect (cut off) the woody seed capsules when they turn brownish and the tips spread open. Put them in a paper bag to release as many seeds as possible. Let them dry for a week or more.

Pliers may still be required to get the last seeds out. Sow right away and leave outside.

OR

Store seeds dry at 40° and sow Dec-Jan outside in situ or in cells, Cover the seeds with 1/8" of grit or vermiculite.

Germination will be staggered after temperatures begin to warm.

***Oenothera coronopifolia*** (Crownleaf Evening Primrose) - Onagraceae Sow seeds in situ in fall. Barely cover with soil. Dorn & Dorn, Growing Native Plants of the Rocky Mountain Area, p. 128.

**D *Onosmodium bejariense* var. *occidentale*** (Western Marbleseed) -

Boraginaceae Store dry at 40° for 4-6 months or longer.

Before sowing or cold stratification, give the seeds a boiling water soak. Put them in a pyrex bowl and pour boiling water over them. Let the water cool and soak the seeds for 24 hours. Sow in situ in the fall or cold stratify at 40 for 3 months before the last frost date. Sow in

cells or in situ. Cover 1/8" deep.

**E *Oxytropis lambertii*** (Purple Locoweed) - Fabaceae

Store seeds dry at 40°.

When daytime temperatures hover consistently around 70° or after the last frost date, scarify seeds with sandpaper. Inoculate with rhizobium inoculant (opt.) and sow promptly in cells or in situ. Cover to depth.

Germinate in 3 days to 2 months.

Germination is **E**. Maintenance in pots is **D**. Use a well draining medium. It might be best to sow in situ or plant small plants as soon as possible.

***Oxytropis sericea* var. *sericea*** (White or Silky Locoweed) -

Fabaceae Treat the same as *Oxytropis lambertii*

**Penstemon spp. germination** information: <[jas3255@yahoo.com](mailto:jas3255@yahoo.com)> (Jim Swayne) <https://tomclothier.hort.net>

***Penstemon clutei*** (Sunset Crater Beardtongue) - Plantaginaceae Store seed @ 70°F (21°C) in a non-humid environment for 6 mo. Sow barely covered 8 wks @ 40°F (4°C), move to 60°F (16°C) for germ. under light. [jas3255@yahoo.com](mailto:jas3255@yahoo.com)

**M *Penstemon grandiflorus*** (Large Beardtongue) - Plantaginaceae Sow 12 weeks before the last frost date in situ or in containers. Put the cells or pots outside for chilling. Surface sow or cover **very** lightly (light requirement.) Germinate in about 2 months at 40°.

***Penstemon pinifolius*** (Pineleaf Penstemon) - Plantaginaceae Cold stratify the seeds 8 weeks at 40° in the fridge or sow midwinter and put the container outside. Cover lightly. Outside treatment in cells requires regular piling on of snow.

OR

Sow late Dec. to Jan. in situ. Cover lightly.

Germinates at around 50°.

*P. pinifolius* can be grown from stem cuttings treated with rooting hormone.

***Penstemon rostriflorus*** (Bridges' Penstemon) -

Plantaginaceae Surface sow 8 wks @ 40°F for germ. in light.

[jas3255@yahoo.com](mailto:jas3255@yahoo.com)

**M *Penstemon secundiflorus*** (Sidebells Penstemon) - Plantaginaceae Cold stratify the seeds 6-8 weeks at 40° in the fridge or sow midwinter and put the container outside. Cover **very** lightly (light requirement). Outside treatment in cells requires regular piling on of snow.

OR

Sow late Dec. to Jan. in situ. Cover **very** lightly.  
Germinates at 70°.

**E *Penstemon strictus*** (Rocky Mountain Penstemon) - Plantaginaceae) Cold stratify the seeds at 40° for 3 months. Sow in situ or in cells. Cover the seeds **very** lightly.

OR

Sow the seeds outside in the fall.  
Self sows prolifically in gardens.

**M *Penstemon virens*** (Blue Mist or Front Range Beardtongue) - Plantaginaceae Cold stratify the seeds 8 weeks at 40°. Sow and cover **very** lightly. Germinate at 65-70°. OR Sow the seeds in cells placed outside or in situ in mid winter.

**M *Penstemon virgatus* var. *asa-gray*** (Oneside Penstemon) - Plantaginaceae  
syn. *P. unilateralis*

Cold stratify 8 weeks at 40°. Sow, cover lightly. Germinate around 65-70°. OR

In mid winter sow the seeds in cells placed outside or in situ.

***Phacelia hastata*** (Silverleaf Phacelia) - Hydrophyllaceae

Store the seeds dry at 40°.

Cold stratification for 3-4 months is required to break the seed dormancy. This can be done several ways.

1. Soak the seeds in tepid water for 24 hours, mix with a small amount of vermiculite or sterilized sand, add water to just barely moisten the mix, refrigerate for 3-4 months. Check the bag once a week for moisture level and any possible mold or even radicle emergence. Sow, cover with 1/4" of soil, expose to 70°. 2. Sow in situ in early winter. Cover seeds lightly.

3. Sow in cells/pots, cover seeds lightly and place the container outside all winter, covering with snow or watering during warm dry periods.

[https://plants.usda.gov/plantguide/pdf/pg\\_phha.pdf](https://plants.usda.gov/plantguide/pdf/pg_phha.pdf) ***Phacelia hastata*** (Silverleaf Scorpionweed) - Hydrophyllaceae

**E *Polansia dodecandra* v. *trachysperma*** (Red Whisker Clammyweed) -

Capparaceae Annual

(Horrible common name. It should be Beeblossom. There is a strange smell from the glandular foliage if you touch it, but it does not waft on the air.)

Late fall to winter, right before a snow, sow seeds of this annual outside where you want the plants to germinate.

**E *Ratibida columnifera*** (Prairie Coneflower) - Asteraceae

Sow outside in fall. OR Cold stratify for 90 days. Sow, cover lightly. Germinate in 8-21

days at 70° (slower if lower temp).

**E *Rudbeckia hirta*** (Black-eyed Susan) - Asteraceae

Annual, Biennial or Perennial

No pretreatment required according to most sources. *R. hirta* has varieties over most of the country so seed germination protocols could vary considerably. Sow by the end of May. Cover the seeds **very** lightly.

They should germinate within 2 weeks. Avoid overwatering and thin seedlings.

**E *Rudbeckia laciniata* var. *ampla*** (Cutleaf Coneflower) - Asteraceae

Cold stratify the seeds for 30 days. Sow and keep moist, cover lightly, 70-75°.

Germinate in 9-10 days. They can receive the 30 days chilling outside.

***Scrophularia macrantha*** (Red Birds in a Tree) - Scrophulariaceae No pretreatment is required. Sow the tiny seeds, cover **very** lightly, and expose to 70°. [alplains.com](http://alplains.com)

***Senecio flaccidus* var. *flaccidus*** (Theadleaf Ragwort) - Asteraceae Sow in situ or in cells in early spring, late April to mid May in the Front Range. Cover the seeds **very** lightly.

***Solidago* spp.** are self-incompatible. In order to collect fertile seeds, you must have more than one seed grown plant.

They also benefit from a period of after-ripening for the embryo to mature. Store seeds dry for 4-6 months before sowing.

Light requirement.

Goldenrods generally do not need a cold stratification, but it probably does no harm to sow outside a month before the last frost date. Sowing in the fall could result in a larger loss of seeds if you only have a few. Some goldenrod species have ranges over the whole country. It is possible seeds of northern provenance could benefit from some cold exposure.

**E *Solidago canadensis*** (Canada Goldenrod) - Asteraceae

Sow after last frost date. Cover **very** lightly. At 70-75°, they germinate in 2-3 weeks. Reproduces strongly by rhizomes.

**E *Solidago gigantea*** (Giant Goldenrod) - Asteraceae

Sow after last frost date. Cover **very** lightly. At 70-75°, they germinate in 2-3 weeks. Likes a bit of moisture so the medium does not have to be well draining.

**E *Solidago multiradiata* var. *scopulorum*** (Rocky Mt. Goldenrod) - Asteraceae I found no information re. germination of *S. multiradiata* (9/28/20), but it occupies similar sites as *S. simplex*, and they can hybridize. I have germinated *S. simplex* '19 and '20, and it germinates in 7-9 days when sown, covered **very** lightly, exposed to 70-75°.

**M *Sphaeralcea munroana*** (Munro's Globemallow) - Malvaceae

Store the seeds dry at 40°. Starting about 8 weeks before the last expected frost, scarify the seeds with sandpaper. Next pour boiling water over the seeds and let the water cool. Soak for 24 hours. Cold stratify for 6 weeks. Sow and cover the seeds **very** lightly. Expose to 70°.

**M *Stanleya pinnata*** (Prince's Plume) - Brassicaceae

Many online references say that *Stanleya pinnata* is non dormant and requires no cold stratification. For 2 years, that technique has not worked for me.

The Extension Service at Utah State University has a site called Native Plants in the Landscape. An article from that source is referenced by [fs.fed.gov](http://fs.fed.gov). They suggest cold stratification for 90 days and to "sow seed to a depth of 1/4' ' in a well drained, peat based soil-less substrate".

**E *Thelesperma filifolium*** (Stiff Greenthread)

Annual.

Cold stratify 2-4 weeks. Do it outside or in cells, not a baggie in a fridge, The radicles emerge in 17 days. Cover the seeds **very** lightly.

***Verbena stricta*** (Hoary Verbena) - Verbenaceae

Store seeds dry at 40 or 70°.

Cold stratify 60 days either outside (cells or in situ) or in the fridge. When sown, cover **very** lightly.

***Verbesina encelioides*** (Golden Crownbeard) - Golden

Crownbeard Annual.

This species is both self and cross pollinated.

In fall, surface sow in situ.

OR

In spring, surface sow the seeds in situ or in pots. If the crop is too heavy, snip off some of the seedlings.

**E-M *Wyethia amplexicaulis*** (Mule's Ears) - Asteraceae

Store the seeds dry at 70° for 6 months. Cold stratify for 90 days either by sowing outside in the winter or by chilling the seeds in the fridge in a moist medium and sowing in cells. Cover lightly. Germinate at 60-70° in 2 weeks.

***Xanthisma spinulosum*** (Spiny Goldenweed) - Asteraceae

Clean to remove chaff. Store dry at 40 or 70 for 6 months.

Sow at 70° with very light cover over the seeds.

**M *Yucca glauca*** (Great Plains Yucca) - Agavaceae

Check the seeds carefully for insect predation.

Sow the seeds at 70°. Cover lightly. They will germinate erratically over 3 months. Fall sowing should work as well.

***Zinnia grandiflora*** (Rocky Mt. Zinnia) - Asteraceae

No cold stratification is necessary. Sow the seeds in situ or in cells from mid spring to early summer (65-75°). Cover lightly. Germination may be erratic.

## Shrubs

**M *Amorpha canescens*** (Lead Plant) - Fabaceae

Scarify with sandpaper. Boiling water soak (Pour boiling water over the seeds. Let it cool and soak 12-24 hours). Cold stratify 30 days. Inoculate (opt.). Sow on well draining mix. Cover **very** lightly with mix or fine vermiculite. 70°. Germinate in 1 week.

**M *Amorpha nana*** (Dwarf or Fragrant Wild Indigo) - Fabaceae

Treat the seeds the same as *A. canescens* seeds.

**M *Atriplex canescens*** (Fourwing Saltbush) - Chenopodiaceae

The plants are usually dioecious, ie. male on female flowers are on separate plants.

Soak the seeds in water for 24 hours. Cold stratify for 5 days. Sow and cover well. Seed can also be sown in situ in fall or early spring and covered well.

[westernnativeseed.com](http://westernnativeseed.com)

When I used the fridge for the cold stratification, about 1/4 of the seeds germinated 5 days after sowing. The rest of the seeds never germinated.

When advancing from cells to a small pot, use a very well draining medium. This species can rot easily in pot culture.

***Cercocarpus montanus*** (Birchleaf Mountain Mahogany) -

Rosaceae De-plume the seeds and store the seeds dry at 40°.

Soak the seeds in water for 30 minutes. Cold stratify for 1 month. Sow and cover the seeds lightly. First leaves appear 17 days after sowing.

Seeds could probably be soaked, sown and covered in situ about a month before the last frost date.

**M *Chamaebatiara millefolium*** (Fern Bush) - Rosaceae

Regional native

Sow outside in fall or early winter. Cover seeds to depth.

Fresh seeds are nondormant, whereas stored seeds require 1 to 3 months of chilling to overcome dormancy. The optimum temperature range for germination of southwestern populations is 18 to 26 °C (65-80°F). [https://www.fs.fed.us/rm/pubs\\_other/](https://www.fs.fed.us/rm/pubs_other/)

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With fresh seeds stratification is ok but reduces the germination rate. Norman C. Deno, First Supplement, p30.

***Ericameria nauseosa*** (Rabbitbrush) - Asteraceae

Jim Borland says fresh seeds need no pretreatment and can be sown after the last frost. Whether standard sized or dwarf this plant can self seed voraciously so I would think seeds could be sown in late fall right after the seeds mature. They need some light to germinate so do not cover deeply.

***Fallugia paradoxa*** (Apache Plume) - Rosaceae

Collect seeds when the pink plumes turn white, and the seeds are easily plucked. Dry and remove the style (plume). This will provide better soil contact for the seeds when they are sown.

In more southern states with summer rains, no pretreatment is necessary. In CO, store the seeds dry at 40°. One month before the last frost, cold stratify at 40° for 1 month. Sow the seeds and cover lightly, place outside at 70°.

***Holodiscus dumosus*** (Rockspirea) - Rosaceae

Store the seeds dry at 40° for 6 months before sowing. This allows them to after-ripen (finish maturing).

The tiny seeds may have a low of 7% viability, and they have a deep dormancy.

[fs.fed.us/database](https://fs.fed.us/database)

At the Denver Botanical Gardens, the horticulturists treat the seeds with sulfuric acid, cold stratify for 4.5 months, treat with Wright's Liquid Smoke and then surface sow. The tray of cells goes under mist at 70°.

For homeowners, I suggest cold stratification for 4.5 months followed by surface sowing and exposure to 70°. Mist with a hand mister as often as possible or create a high humidity chamber of your own invention.

***Rhus glabra*** (Smooth Sumac) - Anacardiaceae

Dioecious

Collect the seeds when they strip easily from the stem.

The red drupes have an oily mesocarp. The fruits can be cleaned after collection or stored at 40° dry until late winter and cleaned when they are drier. Rub them on a sieve to remove the red mesocarp.

Another cleaning method is to "Place the seed heads in a plastic grocery bag, once they are completely dry. Tie the bag shut, and bang it against a hard surface to separate the seeds from the berries." <https://homeguides.sfgate.com/grow-rhus-glabra-seeds>

When you are ready to sow the seeds either fall or late winter, scarify the seeds with acid or sandpaper or a blender with plastic blades. Pour boiling water over the seeds and let the water cool. Soak for 24 hours or 2-3 days. If the seeds are imbibing water,

they should sink.

Cold stratify the seeds for 2-3 months.

When sowing cover the seeds well.

Sow in situ in late fall after removing the red mesocarp and doing the pretreatments.

Cover the seeds well.

OR

After the pretreatments in January-February and sowing in April-May, the seeds should germinate in 10 days at 70° and can be potted 3 weeks later.

***Rhus trilobata var. trilobata*** (Skunkbush or Aromatic Sumac) -

Anacardiaceae Dioecious.

Follow the directions for *Rhus glabra*.

**M *Rosa blanda*** (Smooth or Woods' Rose) - Rosaceae

Remove fleshy material after collection. To accomplish the cleaning, put the fruits in a small bowl with enough water to cover the seeds by 1 inch. Let the concoction sit for several days to ferment. When the fruits soften, remove the seeds. Sow in fall, cover the seeds and put the containers outside. The seeds may need scarification as well as stratification (at least 3 months), and germination can be erratic.

## **Grasses (most benefit from big temperature swings anywhere in the range of 80-90° in the day to 34-50° at night)**

**M *Andropogon gerardii*** (Big Bluestem) - Poaceae

Warm season.

Store seeds dry at 40°. Then sow seeds at 75-80° (a germination blanket would be helpful to achieve the desired warm temps but temps should drop dramatically every night). Large temperature fluctuations from day to night help warm season grasses germinate.

Big Bluestem has a low percentage of fertile seeds. I collected at least 5 ecotypes of seeds and established them in a meadow. Thereafter I collected many more fertile seeds.

Spring planting of plants would be desirable, but fall planting may succeed if the plant has a substantial root system. This warm season grass will not grow over the fall and winter. It will begin active growth when temps warm in spring.

***Andropogon hallii*** (Sand Bluestem) - Poaceae

Warm season.

Grows on the top of sand dunes.

It is related to Big Bluestem, and it has the same fertility issues. It may have few fertile seeds in the inflorescence.

Store seeds dry at 40°.

Seeds do not require cold treatment to germinate. They germinate in the fall and

overwinter as seedlings. [fs.fed.gov/database](https://fs.fed.gov/database)

No pretreatment. Plant outside fall or spring 1/8 to 1/4" deep. - [westernnativeseed.com](https://westernnativeseed.com)

***Bothriochloa laguroides* ssp. *torreyana*** (Silver Bluestem) -

Poaceae (syn. *Andropogon saccharoides*)

Warm season.

I have not germinated this species, but I think the treatment for *Bouteloua curtipendula* would apply to this species.

**E *Bouteloua curtipendula*** (Sideoats Grama) - Poaceae

Warm season.

Store seeds dry at 40°.

In mid March-mid April, sow outside in cells or in situ (protect seeds from birds). Cover to depth. The seeds do not require a pretreatment (cold stratification), but they germinate best when they are exposed to large temperature swings (70-90° with nights 35-45°). They will germinate in 2-7 weeks. The plants often bloom that year.

**M *Bouteloua gracilis*** (Blue Grama) - Poaceae

Warm season.

Store dry at 40° (dry cold stratification) - [prairiemoon.com](https://prairiemoon.com)

Sow mid April to mid May in situ or in cells. Cover lightly. Germination seems lower than in some of the other warm season grasses. Be generous when sowing the seeds.

**E *Elymus canadensis*** (Canada Wild Rye) - Poaceae

Cool season.

Sow mid April in the FR. Cover the seeds **very** lightly. They germinate in 11-17 days. If you sow them in situ, protect the seeds from birds. If grown in cells, plant them in June. Plants left in cells in the heat of summer easily rot from overwatering. They may bloom that year.

This grass species can tolerate some shade.

**E *Panicum virgatum*** (Switchgrass) - Poaceae

Warm season.

Sow anytime from April 1- May 1, in cells kept outdoors or in situ. Cover lightly.

Switchgrass germinates best when the seeds receive large temperature swings (70-90° day-34-50° night). Germinate in 22-25 days.

**E *Schizachyrium scoparius*** (Little Bluestem) - Poaceae

Warm season.

Sow April 1 to mid summer in cells or in situ. Cover lightly. Germinate in about 20 days, depending on the temperature.

**E *Sorghastrum nutans*** (Indian Grass) - Poaceae

Warm season.

Store seeds dry at 40°.

Sow anytime from April 1- May 1, in cells kept outdoors or in situ. Cover lightly.

Germinate in 30-48 days.

free downloads of Seed Germination Theory and Practice 2nd ed. and 2 supplements.<https://www.gardenfundamentals.com/seed-germination-deno/>