

Germination Guide for Native Seeds

Jan Midgley 2/15/21

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 the 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 allows the embryo to afterripen 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

“No cold stratification is necessary. Sow in May.” Cover very lightly. email 11/2/20 from Sherry Fuller, propagator at the Gardens on Spring Creek, Ft. Collins, CO

Golden Columbine can be sow in situ in late fall or in spring.

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.

Annuals can be started in cells/pots in the spring. Use light cover material.

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

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

Sow after the last frost date. Lightly cover the 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 to May. Soak the seeds in diluted peroxide (1/2 C. tepid water + 1/4 oz. 3% hydrogen peroxide) for 24 hours. Rinse well. Sow in cells or in situ. Cover very lightly for light exposure. 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 nuttallii* (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.

E *Castilleja integra* (Wholeleaf Paintbrush) - Orobanchaceae

Hemiparasitic.

Place the seeds in the palm of one hand. Rub them with a finger to remove a loose net that surrounds each seed. Cold stratify the seeds for 3-4 months either in the fridge or outside. If giving an outdoor winter treatment, sow in situ near a grass or artemisa or sow in cells/pots and cover lightly. Pile snow on top of the cells/pots or water as necessary during the winter. With a constant moist 40°, radicles begin to emerge as early as 16 days. Cotyledon leaves appear in 3.5 months. As soon as the seedling has two sets of true leaves, pot it in well draining soil with a host plant such as *Artemisia frigida*, *Liatrix punctata* or a nonaggressive grass.

M *Chamerion angustifolium* (Fireweed) - Onagraceae

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).

***Cleome* (see *Peritoma*)**

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

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 moist seeds 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. worldseedsupply.com

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

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

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

Echinacea angustifolia (Prairie Coneflower) - Asteraceae

Sow in situ in fall.

OR

Cold stratify for 1-3 months before the last spring frost date. Sow in cells or in situ. Cover the seeds.

Engelmannia pinnatifida (Engelmann's Daisy) - Asteraceae

Sow in situ in early fall. Press tightly into the soil. The seeds require light to germinate.

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 perianth 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 or pots because the radicles emerge erratically for 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

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 passed 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

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

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 the sun.

Transplant into a deep pot filled with 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

E *Grindelia subalpina* (Subalpine Gumweed) - Asteraceae

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

Collect the seeds as late as possible hoping the stickiness of the involucre bracts will decrease. The pappus of the seeds can glue the seeds to each other and to the bracts. The involucre bracts make a cup that is upright, and the seeds remain in the cup for months. Alternatively cut a long stalked inflorescence and stick it into a chain line fence with the cup upright. After a month or more, the cleaning is much less gummy.

Freeze dry seeds for 2 weeks to kill seed eating pests.

Store dry at 40°.

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

Grindelia squarrosa (Curlycup Gumweed) - Asteraceae

Sources online vary as to whether to cold stratify or not.

I plan to follow directions for *Grindelia subalpina* which work very well.

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 the seeds.

M *Helianthus pumilus* (Little Sunflower) - Asteraceae

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

Store dry at 40°.

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

Sow in mid Dec., cover the seeds lightly and put outside for the winter.

M *Heliomeris multiflora* (Showy Goldeneye) - Asteraceae

Keep seeds dry at 70° for a year to afterripen. 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

Cold moist stratify 1-2 months. 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. Western Native Seed). Inoculate with rhizobium legume inoculant (opt.). Sow, cover the seeds, expose to 70°.

Bob Nold says no cold treatment is needed. I will test this method.

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 east of the Mississippi 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 in spring in situ or in cells after the last frost date. No pretreatment is necessary.

Cover very lightly.

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

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 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 in situ in fall. Barely cover with soil. Dorn & Dorn, Growing Native Plants of the Rocky Mountain Area, p. 128.

Oenothera villosa (Prairie Primrose) - Onagraceae

“No pretreatment. Plant outside fall to spring. Plant to 1/16 inch deep. Takes 3-4 weeks to germinate.” - westernnativeseed.com

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

Store dry at 40° for 4-6 months or longer (afterripen).

Sow in situ in the fall.

OR in winter

Before either of the following methods of 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. 1. Sow around Jan. 1, cover the seeds 1/8” deep with medium, and put the cells/pots outside. 2. Or 3 months before the last frost date, cold stratify the seeds in the fridge, 40°(3m). Sow in cells or direct sow in the garden. Cover 1/8” deep.

Opuntia phaeacantha (Tulip Pricklypear) - Cactaceae

“Opuntias germinate more effectively the second year after harvest. Fresh seed often lies in the ground for about a year before germination.” jelitto.com

After collection of the ripe fruit, remove as much fleshy material as possible. Wash the seeds to remove all pulp, and dry them on a paper towel in a warm place for a week or two until completely dry. Store dry at 40°. There is a gelatinous material around the seeds, and I’m not sure if it is a germination inhibitor or if it would help hold moisture around the seeds in the ground in a natural situation. Maybe it does both.

When you are ready to sow the seeds, scarify with sandpaper or a boiling water soak or both. Sow the seeds in pots 1” apart. Just push them into the cactus mix gently and barely cover with medium. Mist regularly until they germinate. Maintain an ambient temperature of 70° in the daytime and above 45° at night. When potting, add extra drainage material to the mix and use small pots.

<https://homeguides.sfgate.com/grow-prickly-pear-cactus-seeds-69589.html>

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 direct sow in the garden. 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 to sow in 2.5” pots instead of cells to avoid disturbing roots.

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

Treat the same as *Oxytropis lambertii*

Penstemon spp. germination information: <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

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

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 situ or in cells placed outside 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 situ or in cells placed outside.

E *Peritoma serrulata* (Rocky Mountain Beeplant) - Capparaceae
syn. *Cleome serrulata*
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.

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

E *Polansia dodecandra v. trachysperma* (Redwhisker Clammyweed) - Capparaceae
Annual

(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.
It can be sown in pots in the spring. Plant as soon as it has a few true leaves.

E *Ratibida columnifera* (Prairie Coneflower) - Asteraceae

Sow outside in fall. OR Cold stratify for 30 days. Sow, cover lightly. Germinate in 8-21 days at 70° (slower if lower temp).

They may need no cold treatment. Email Sherry Fuller, Gardens at Spring Creek, 11/2/20.

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

Senecio flaccidus* var. *flaccidus (Threadleaf 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.

Store seeds dry for 4-6 months to allow the embryo to mature (afterripen).

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 the last frost date. Cover **very** lightly. At 70-75°, they germinate in 2-3 weeks.

Reproduces aggressively by rhizomes.

E *Solidago gigantea* (Giant Goldenrod) - Asteraceae

Sow after the 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* seeds are not dormant and require no cold stratification. For 2 years, that technique has not worked for me. Maybe I need more than one parent plant from which to collect seeds.

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](https://www.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 *Symphyotrichum ericoides* (White Heath Aster) - Asteraceae

Store seeds dry at 40 or 70°.

No pretreatment is required. Sow a week or two after the last frost date in spring. Cover the seeds **very** lightly.

E *Symphyotrichum oblongifolium* (Aromatic Aster) - Asteraceae

Follow directions for *S. ericoides*.

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.

Yucca baccata (Blue Yucca) - Agavaceae

“Yuccas will germinate promptly from fresh seed held over winter (in moist sand in the fridge).

Seeds germinate best in 60-70 degree temperatures. Yuccas may also be grown from rhizomes, stem cuttings, or by digging offsets from the side of established plants. Transplant into a well draining medium. wildflower.org

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 Mountain 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 a well draining mix in deep cells or pots. 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

When I used the fridge for the cold stratification, about 1/4 of the seeds germinated (radicles emerged) 5 days after putting them in the fridge. 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°. The plume drills the seed into the ground in nature, but in horticulture, we cover the seeds with some medium.

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, and direct sown in the garden about a month before the last frost date. Cover the seeds.

M *Chamaebatiaria millefolium* (Fern Bush) - Rosaceae

Regional native

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

Fresh seeds are non-dormant, 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/wo_AgricHandbook727

With fresh seeds cold 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 cover lightly.

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°.

M-D *Holodiscus dumosus* (Rock Spirea) - Rosaceae

Store the seeds dry at 40° for 6 months to allow the embryo to mature (afterripen). The tiny seeds may have a low of 7% viability, and they have a deep dormancy. [fs.fed.us/ database](https://www.fs.fed.us/database)
At the Denver Botanic 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 very light sandpaper scarification, cold stratification for 4.5 months, a smoke treatment before or after sowing, 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. If you have no liquid smoke, just skip that step.

E *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.

Woody Vines

Parthenocissus quinquefolia (Virginia Creeper) - Vitaceae

Introduced to CO from eastern states.

“Collect fruits after they have turned bluish black by hand-stripping from the vine. Extract seeds from pulp and air-dry. Store in sealed containers at 42 degrees.

Sow seeds in fall or stratified (in moist sand or peat for 60 days at 41 degrees.) and sow in spring.” wildflower.org

Cover the seeds 1/4”.

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

E-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

No pretreatment. Plant outside fall or spring 1/8 to 1/4" deep. - 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

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 early-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 scoparium* (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 Deno, Norman, Seed Germination Theory and Practice 2nd ed. and 2 supplements. <https://www.gardenfundamentals.com/seed-germination-dr deno/>