

Germination Information for Seed Swap

Jan Midgley 10/4/20

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

E *Achillea millefolium* (Common Yarrow) - Asteraceae

Dry store the seeds 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.

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°. After-ripening 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 polyanthemos (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.

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 tuberosa* (Butterflyweed, Orange Milkweed) - Apocynaceae

Collect seeds when the follicle 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.

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

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 them cool and soak 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. worldseedsupply.com

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

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

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 situ or in cells) and leave them out. Cover with about 1/16" of medium. Germination may occur at 70° or at 40° or anywhere in between.

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

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

Sow outside in late fall. 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.

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, but 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. These seeds came from a plant with red rays barely tipped with yellow.

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 last frost.

For sowing 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.

E *Grindelia subalpina* (Subalpine Gumweed) - Asteraceae

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

Collect the seeds when the involucral bracts are not super sticky. Otherwise the pappus of the seeds will glue the seeds together and to the bracts.

Store dry at 40°.

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

E *Helianthus annuus* (Common Sunflower) - Asteraceae

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 have 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.

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 gro 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.

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

Taprooted Annuals or Biennials

Store seeds dry at 40°.

Sow outside fall or spring. No pretreatment is necessary. Sow seeds in May after last frost date, 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.

Seeds can be sown in situ in the fall as well.

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* (Whitist Evening Primrose) - Onograceae

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) - Onograceae

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. OR

Store seeds dry at 40° and sow in Dec. OR

Sow Dec-Jan outside in situ or in cells, Cover the seeds with 1/8" of grit or vermiculite. Germination will be staggered.

Oenothera coronopifolia (Crownleaf Evening Primrose) - Onograceae

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

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. Inoculate with rhizobium inoculant (opt.) and sow promptly. 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 plant small plants as soon as possible.

Penstemon ssp. 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 and put the cells or pots outside for chilling.

Surface sow or cover **very** lightly (light requirement.)

Germinates in about 2 months at around 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

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°.

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.

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.

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 ***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

Senecio 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.

E Solidago multiradiata var. scopulorum (Rocky Mt. Goldenrod) - Asteraceae

I found no information re. germination of *S. multiradiata* (9/28/120), 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. 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.

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.

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* & *A. nana* (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

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

Deplume the seeds and store them 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 in 17 days after sowing.

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

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/wo_AgricHandbook727

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 (Alpache 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 allow 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

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.

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 until it starts rotting. 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 range of 80-90° in the day - 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 is fine if the plant has a substantial root system. This warm season grass will not grow over the fall and winter but will begin active growth when temps warm in spring.

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

(syn. *Andropogon saccharoides*)

Warm season.

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

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

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 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.

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