

## PLANT MATERIALS TECHNICAL NOTE

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### The NRCS Field Office Guide to Collecting Wildland Seed

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**Why collect?** The Bridger Plant Materials Center, in cooperation with the Montana NRCS Field Offices and associated Conservation Districts, developed a long-range plan identifying conservation problems that can be solved with plants and/or propagation techniques. The PMC developed a list of appropriate plant species required to address those issues. NRCS field personnel are relied upon to collect wildland seed for initial performance evaluation. The PMC also encourages species nominations and collections from private landowners and other state and federal agencies.

**What to Collect?** The Plant Materials Specialist sends out an NRCS bulletin every spring listing high-priority species. The PMC newsletter also publishes the list in the spring and summer issues. A detailed description of each species and photographs are available on the Montana NRCS website at <http://www.mt.nrcs.usda.gov/technical/ecs/plants/collections/>. It is important to become familiar with the list prior to field season so that collection opportunities are maximized. Wildflower populations must be identified during flowering because it is difficult to locate the plants after the colorful blossoms have gone to seed. Know what to look for and mark the site for later visitation to collect seed. A GPS unit comes in very handy to record site location.

**Where to Collect?** Never collect seed from a yard, lawn, garden, park, or any other obviously cultivated site! Seed should be collected only in a wildland setting, such as a prairie, valley, hill, mountain foothill, mountain, etc. It is important to obtain a complete genetic representation, so sample from many plants, not just a single, or even several individuals. Plant populations growing in unusually

harsh conditions are very good candidates for collection. Collect as much seed as possible over an entire area that is environmentally similar in associated plant community composition, soil type, aspect, and elevation. This means, for example, the same habitat type, range site, ecological site, etc. Most of the high-priority species have a very large geographic distribution, so it will be necessary to conduct several collections across all the counties within a Natural Resource Area. Always obtain prior permission from the landowner to collect seed.

**When to Collect?** The actual time of flowering and fruiting will vary from year to year, with precipitation and temperature as the driving factors. An early spring and dry summer may hasten seed set, while lower summer temperatures may delay flowering and seed ripening. It is necessary to periodically monitor plants for seed maturity. Generally, seed set occurs 6 to 8 weeks after anthesis (flowering). Table 1 contains examples of the earliest expected seed collection dates by Natural Resource Areas. Seed is usually ready to harvest when it feels firm. Hand cut a cross-section in a few representative seeds to determine stage of maturity. Figure 1 illustrates the difference between immature seed in a soft dough stage, as compared to mature seed in a hard stage. Seed in the firm dough stage will continue to mature into viable seed. The trick is to avoid collecting seed that is green, or immature, but also to harvest prior to shatter and dispersal.

Table 1. Earliest Expected Seed Collection Dates for 10 Genera of Native Wildflowers. NRCS Montana Natural Resource Areas.

Species Code <sup>†</sup>	Columbia Basin	Headwaters	Upper Missouri	Lower Missouri	Lower Yellowstone
ASTRAG	late July	7/15 to 7/25	7/17 to 8/1	early August	mid-August
GAAR	8/8 to 8/15	9/1 to 9/12	8/10 to 8/15	8/15 to 8/20	7/25 to 8/1
LIPU	NA	8/29 to 9/6	9/24 to 10/8	9/22 to 10/1	9/14 to 9/22
PENST	8/5 to 8/12	8/12 to 8/20	9/1 to 9/5	8/23 to 8/28	8/20 to 8/25
PHHA	7/28 to 8/5	7/25 to 7/29	NA	NA	8/11 to 8/20
PSTE	NA	8/25 to 8/29	8/12 to 8/17	8/5 to 8/10	early August
RACO	mid-August	8/11 to 8/16	8/14 to 8/18	8/6 to 8/12	8/7 to 8/14
SPCO	8/5 to 8/10	8/5 to 8/11	7/21 to 7/31	7/31 to 8/4	8/24 to 8/28
THRH	NA	7/15 to 7/22	7/6 to 7/10	6/20 to 7/4	early July
VIAM	7/27 to 8/4	6/28 to 7/15	7/18 to 7/27	7/20 to 7/26	8/15 to 8/20

<sup>†</sup> *Astragalus*, *Gaillardia aristata*, *Liatris punctata*, *Penstemon*, *Phacelia hastata*, *Psoraleidum tenuiflorum*, *Ratibida columnifera*, *Sphaeralcea coccinea*, *Thermopsis rhombifolia*, *Vicia americana*.

NA-No knowledge of specimen record housed in MSU Herbarium.



Figure 1. Immature, soft dough stage on the left, and mature, hard stage on the right.

**How to collect?** A physical examination of the seed is crucial! Take time to visually inspect for signs of immaturity.

- There should not be any remaining sign of flowering parts, such as anthers, stamens, or petals on the plant. Try to collect seed during dry weather because excess moisture is fatal to seed viability.
- Remove a small portion of the inflorescence and rub vigorously in the palm of the hand to loosen the seed from the stalks. It may be necessary to use a hand lens or other eye aid to get a close enough look to identify the seed.
- Carefully sort through the chaff for seeds and check readiness by clipping with a fingernail clipper, cutting with a knife, or biting between teeth. The latter technique should not be employed if the plant is known to be poisonous!
- The seed is ready to harvest when no doughiness is evident and the endosperm is firm. No moisture should be present when the seed is cut or rubbed in the palm of the hand. Mature seed ranges in color from tan to dark brown, and rarely is green. It will be necessary to check several plants in the immediate area, as ripening will vary among individuals. Waiting a few days may result in a more fully mature seed crop.
- Native legumes are very often attacked by seed predators. Carefully cut open a few seed and inspect for the presence of live larvae. Make sure there is not just an empty shell left behind after the insect consumed and vacated the seed. Another clue is the presence of a minute entrance hole where the insect accessed and vacated through the seed coat.
- Use a sharp utensil, such as scissors, knife, hand-scythe, or clippers to remove the inflorescence and a small amount of stalk. In many instances where the size of the area and number of plants is moderate, it is just as easy to hand-strip. It is best to harvest only the inflorescence or seed structure, as unnecessary vegetation such as leaves and stems, add undesirable moisture and bulk. In the case of indeterminate flowering (different stages occurring on a plant at the same time), a greater amount of material should be harvested to allow more seed to mature.
- Gloves may be needed for handling the sharp or stickery capsules and pods of some species.
- Collect as much seed as possible, while only taking approximately 20% of the total seed crop in a given area.
- At this time of the year, many of the plants will be very dry and brown in appearance. If possible, choose only to harvest from healthy, robust plants.
- Carefully place material in paper sacks with adequate room for air circulation to promote drying.
- Do not store seed for any length of time in plastic sacks! Plastic holds moisture and increases temperature and humidity, which very quickly promotes mold and damages the seed.
- Label each sack with the species, collector's name, and the date.
- Complete in full, the NRCS-ECS-580 Plant Collection Information Form, located at <ftp://ftp-fc.sc.egov.usda.gov/MT/www/forms/ecs/national/ecs580.pdf>. Record a description of all physical characteristics, such as elevation, aspect, slope, soil texture, annual precipitation, MLRA, associated species, and ecological condition. Accurately record site location with the use of both a GPS unit and a topographical map to document the township, range, and section, and the proximity of landmarks, such as geographic formations, roads, rivers, bridges, structures, land ownership, etc. This is important because it may be necessary to re-visit the site sometime in the future.
- After transporting, leave the sack open and periodically stir up the contents to promote drying. It is best if material can be spread out on a flat surface to dry at room temperature. When curing is complete, temporarily store the bag in a place that is cool and dry until it can be sent to the Bridger PMC.

**Where to send?** Mail or deliver seed collections to the following address.

USDA NRCS Plant Materials Center  
98 South River Road  
Bridger, Montana 59014

**What now?** The PMC processes the material to clean seed, assigns an accession number to each viable collection, and periodically installs Initial Evaluation Plantings to test the performance of individual collections against one another. Assigned accession numbers are sent to the original seed collector(s) so they also can track the reported performance of the material throughout the testing and selection process. Superior performing material will proceed to Comparative Evaluation Plantings, Seed Increase, Field Evaluation Plantings, and eventual selection and release for distribution to the commercial seed industry.

**How does this help?** The NRCS Field Offices play a vital role in the continued testing and selection of native species that help to conserve and protect the natural environment. The PMC's plant release tool-box of 26 grass, forb, legume, tree, and shrub species, will, with the assistance of the Field Offices, continue to grow and be beneficial in biomass production, carbon sequestration, erosion reduction, wetland restoration, wildlife habitat, water quality improvement, streambank and riparian area protection, and other special conservation treatment needs.

**Need more details?** Additional information can be found in the following references:

-*Plant Materials Collection Guide*, USDA NRCS Boise, Idaho, Technical Note Plant Materials No. 1, December 2003. <http://www.plant-materials.nrcs.usda.gov/pubs/idpmctn5386.pdf>

-*Collecting Plant Material*, USDA NRCS Brooksville, Florida, Technical Note No. 35, 1997. <http://www.plant-materials.nrcs.usda.gov/pubs/flpmctn3597.pdf>

-*Collecting, Processing, and Germinating Seeds of Wildland Plants*, J.A. Young and C.G. Young, Timber Press, October 1986.