Drying, Cleaning, and Storing Prairie Seed

Collecting native seed requires a considerable investment of time, patience, and diligence. If the seed is to be stored for any length of time, the next step is to properly care for the harvest! Drying, cleaning, and storage requirements for prairie seed after collecting will depend on how and which species are collected, the length of time stored, and the intended seeding method. If seed is collected in bulk and immediately spread on a restoration site, little processing is necessary. Also, seed quality varies greatly from each species to facilitate thorough cleaning and assessment of seed quality. This is especially important if seed is collected for long-term storage, seedling propagation, seed testing, or for special restoration efforts.

Consider keeping seed collections separate for individual species to facilitate thorough cleaning and assessment of seed quality. The quantity of material collected will dictate the scale of time, tools, and equipment needed for efficient drying and processing of the seed. Much of the bulk material in native seed collections is non-seed (inert) floral parts, leaves, and stems. Threshing the seed out of seed heads or pods, and thus help maximize seed yield. Small amounts can be placed loosely in cloth or paper bags and spread out on screening or newspaper in a cool, dry place with good air circulation. If using paper bags, leave tops open and turn the contents once or twice daily. Take care not to pack collected bulk material into bags too tightly; keep it loose so air can circulate. Air-tight bags or containers for dried seed

Important Tips on Seed Drying

Drying bulk material immediately after harvest is critical for preventing mold and mildew. Drying will also allow some immature seeds to ripen and aid threshing of the seed out of seed heads or pods, and thus help maximize seed yield. Small amounts can be placed loosely in cloth or paper bags and spread out on screening or newspaper in a cool, dry place with good air circulation. If using paper bags, leave tops open and turn the contents once or twice daily. Take care not to pack collected bulk material into bags too tightly, keep it loose so air can circulate.

Larger quantities can be spread on tarps and turned once or twice daily with pitchforks. Place box fans strategically to keep air circulating over and around bulk material. Do NOT use any form of direct heat! It can damage and kill seeds. Drying may take several days to two weeks, depending on quantity and drying conditions.

Some Simple and Effective Cleaning Techniques

Simple techniques are available to effectively clean modest amounts of seed. Proper cleaning will remove much of the inert material and dust, and also remove empty, non-viable seeds. These cleaning techniques involve various ways of threshing (knocking seed free of seedheads) and sorting seed using screens and air flows. Material should be properly dried before further cleaning.

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Threshing - Stomp Method

Species with large, coarse seed heads that tend to hold the seed tightly can be threshed by stomping. This method is very effective on wild indigo (Baptisia), rattlesnake master (Eryngium), compass plant and rosewood (Silphium), sunflowers (Helianthus), black-eyed susan and sweet coneflower (Rudbeckia), golden Alexander (Zizia). Using large plastic tubs, place a 2-in.-layer of bulk material in the bottom and stomp. Kick the sides of the tub to break up any stubborn seed heads. Stomped material is then screened through a coarse ½-in. or ¼-in. screen into a second tub. Continue in batches, returning any intact seed heads remaining to the stomping tub. Pale purple coneflower (Echinacea) tends to be stubborn and may require machine threshing, unless it’s collected late in the season after seed heads naturally begin to break apart.

Threshing - Shake Method

Many species have seeds that shake free of a capsule or open pod. This method can be effective for dried seedheads of Culver’s root (Veronicastrum), cardinal flower and great blue lobelia (Lobelia), shooting stars (Dodecatheon), mints (Pycnanthemum, Monarda), and gentians (Genus). Either hold dry seedheads upside down and tap against the inside of a tub or place in a bag and shake or beat gently to free seed. This method has the advantage of minimizing the amount of chaff and inert material in the seed.

Threshing - Screen Method

Hand clipped and dried seedheads of blazing stars (Liatris), asters (Symphyotrichum), and goldenrods (Solidago, Verbesina), and spiderworts (Tradescantia), for example, can be threshed by rubbing the seed heads over a large screen made of ¼-in. or ½-in. hardware cloth using gloved hands or aluminum scoop shovels. Elevate the screen on sawhorses over a tarp, fluff seed will float down onto the tarp and can easily be scooped up for further processing.
Scalping
Scalping removes objects larger, longer, and wider than the desired crop seed. Screens used for scalping have pores larger than the seed. Most compassplant seeds will fall through a ¼ inch mesh, for example, which scales off larger bits of leaves, stems, and branches. Scalping material through a much larger screen first, and then one closer to seed size is often more efficient, allowing material to flow more freely through each screen.

Grading or Sizing
Grading sorts desired seed, or “crop” seed by size. Any given species’ seed will contain a range of seed sizes. Avoid intentionally grading screen intended for restoration plantings, since selection for seed size can happen in one generation, (i.e., large seeds will give rise to large seeds), etc. to allow dust, broken seeds, etc. to pass through, then using air-flow to separate seed from inert matter can harbor fungal and insect pathogens, which might damage seed during storage. Cleaning seed properly and thoroughly will extend viability. Overly aggressive cleaning, however, can damage seed and shorten longevity of stored seed. Care should be taken with debearding or de-hulling processes not to damage or break seed.

Sifting
Sifting is the final screening step. Use a screen with pores just larger than the seed to allow dust, broken seeds, etc. to fall through and yet retain desired seed on screen. For example, most compassplant seeds won’t fall through a ¼ inch screen, but smaller bits of plant material will, especially the straw.

Airflow - Winnowing
Winnowing uses horizontally moving air to separate heavy from light particles containing seed. In a gentle breeze can be very effective in removing chaff and light seed. To achieve more control, place a tarp on the floor and an ordinary box fan at one end of the tarp. Pour seed gently in front of the fan. Heavier seed falls closer to the fan than light seed. Fine-tune the process by experimenting with fan speed and distance from fan. Once you find the most effective combination, continue to pour the seed in front of the fan in a consistent manner. The seed should now be laying somewhat funnel-shaped on the tarp, with the heavier seed nearer to the fan and light or empty seed further away. Using a handmull, push down on the seed closest to the fan at first, then gently moving the seed away from the fan. Heavy seed will feel firm and resist being pushed down, whereas downward pressure, even on empty seeds, on the other hand, will offer little resistance and crush easily. Make a determination where the heavy seed ends and the light or empty seed begins, and draw a line through the pile of seed at this point. Clean, heavy seed can then be swept up and stored for planting, while the rest is discarded.

Airflow - Aspirating
Aspirating uses vertically moving air to suspend particles in a column. Lighter seeds are either captured in a pocket of the column, as in a South Dakota seed cleaner, or blown completely out of the column. Fanning mills, which both screen and aspirate seed, can sometimes be purchased at farm sales for a modest price, but require repairs.

What is Dehulling?
Dehulling removes seeds from these pods. Seeds of native legumes (bean family) are tightly held in small pods or hulls (e.g. prairie clover, showy tick trefoil, leafstalk, roundhead bushclover). De-hulling removes seeds from these pods.

Are Debearding and De-hulling Necessary?
Debearding and de-hulling fluffy grass and forb seed and de-hull legume pods doesn’t absolutely necessary for seed to germinate and grow, at least eventually, and are impractical to do by hand except on a small scale. These techniques do provide important benefits, however, and are used routinely by commercial native seed producers. Both of these techniques improve fluidity of the seed allowing it to be cleaned to greater purity and germination. Seed will flow through a seed drill more efficiently when planted, and removing awns or hulls improves seed-to-soil contact important for timely germination.

In addition, mechanical de-hulling provides scari fication, a process that prepares the hard seed coat of legumes to more readily absorb water for germination. Removal of pappus or awns also allows for more accurate laboratory seed testing, since hulls can mask seed quality. De-awning or de-hulling small lots of seed by hand is time consuming and dary, but can be done. It can be accomplished by rubbing fluffy seed over a small mesh screen or openings just large enough for the seed to pass through, then using air-flow to separate seed from chaff. A small-gallon sized Fosberg huller/scarer machine is useful for de-awning small quantities of seed. This type of machine is very aggressive and only a few seconds of treatment are typically needed. Another inexpensive device is the Hoffman Mfg hand deawener/debarker.

What is Debearding?
Many grass species have seeds with “hulls” (hair-like awn), and many forb species have “parachutes” (pappus) attached to seeds (e.g. fluffy seed of asters and goldenrods, cowparsnip awns and pappus are adaptive and aid seed dispersal in nature). Debearding is the process of removing these hair-like appendages. The terms described above are sometimes used interchangeably and applied to both grass and forb seed.

Storage
Proper storage of seed is essential to maintain viability (ability to germinate) and vigor (ability to successfully establish in the field). Seed can be kept in a cool, dry, insect-free place for up to a year. Long-term storage requires a stable temperature- and humidity-controlled environment. Seed stored at 67°F stays viable twice as long as seed stored at 70°F. A good rule of thumb is that the sum of the temperature (degrees Fahrenheit) and relative humidity (%) should not exceed 100. Examples would be storing seed at 50°F and 40% RH or 40°F and 50% RH, the addition of the two is less than 100. Relative humidity above 40% is enough to cause detrimental to legume (oil based) seeds. Once seed has been dried properly, moisture resistant containers, such as glass or plastic jars, or 4-mil plastic bags (Ziplocs), will help protect seed from collecting moisture.

Selected Prairie Resources
Prairie Plants Resource Institute and Nebraska Game and Parks Commission. 47 p.