What is Debearding?

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

What is Dehulling?

The terms debearding and dehulling are sometimes used interchangeably and applied to both grass and forb seed. Dehulling primarily involves removing the seed coat (hull) and the pappus from seeds which help to aid seed dispersal in nature.

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, rodent-proof place for up to a year. Longer-term storage requires a stable temperature- and humidity-controlled environment. Seed stored at 60°F (16°C) stays viable twice as long as seed stored at 70°F (21°C). A good rule of thumb is that the sum of the temperature (degrees Fahrenheit) and relative humidity (RH) should not exceed 100. Examples would be storing seed at 50°F (10°C) and 40% RH or 40°F (4°C) and 50% RH; the addition of the two is less than 100. Relative humidity above 40% is especially detrimental to legume (oil-based) seeds. Once seed has been dried properly, moisture-resistant containers, such as glass or plastic jars, or 4-ml plastic bags (Ziplocs), will help protect it from collecting moisture.

Other Important Factors Affecting ‘Shelf-life’

Important factors besides temperature and humidity can affect longevity of stored seed. Non-seed ( 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.

Storage Affects Germination

Germination tends to increase slightly in some species stored up to a year after harvest as dormancy mechanisms break down. Germination then declines over the long term due to seed mortality during storage. Proper storage conditions will slow this decline.

Equipment Needed

This is a basic list of equipment needed for drying, cleaning, and storing native seed on a modest scale:

Drying
- Good-quality dust masks
- Netprint (or steel frames for spreading out large quantities of seed)
- Screens of various mesh-sizes and dimensions
- Plastic tubs and containers of various sizes
- Leather gloves
- Low humidity and good air circulation
- Cleaning
- Storage
- Airtight bags or containers for dried seed

To request copies, or for more information, call the Tallgrass Prairie Center at 319.273.3836.

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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 or 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.

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 seed. These cleaning techniques involve various ways of threshing (knocking seed free of seed heads) and sorting seed using screens and airflow. Material should be properly dried before further cleaning.

Threshing — Stomp method

Species with large, coarse seed heads that tend to hold the seed tightly can be threshed by stomping on seed heads. This method is very effective on species of wild indigo (Baptisia), rattlesnake master (Eryngium), compass plant and rosinweed (Silphium), sunflowers (Helianthus), black-eyed susan and sweet coneflower (Rudbeckia), and golden Alexanders (Zizia). Using large plastic tubs, place about a 2-inch layer of bulk material in the bottom and stomp on it with waffle-type boots. Toe kicks to the corners of the tub help break up any stubborn seed heads. Stomped material is then screened through a coarse 1/4-inch or 1/2-inch screen into a second tub. Continue in batch- es, 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 free of a capsule or open pod. This method can be effective for dried seedheads of Cutler’s root (Veronicastrum), cardinal flower and great blue lobelia (Lobelia), shootingstars (Dodecatheon), mints (Pycnanthemum, Monarda), and gentians (Gentiana). Either hold dry seed heads upside down 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.

Scraping

Scraping removes objects larger, longer, and wider than the desired crop seed. Screeens used for scraping have pores larger than the seed. Most compass plant seeds will fall through a 1/8-inch mesh, for example, which scalps off larger bits of leaves, stems, and bracts. Scraping screens through a much larger screen first, and then one closer to seed size is often more effective, 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 seed intended for restoration plantings, since selection for seed size can happen in one generation. (i.e., large seeds will give rise to plants with larger seeds), and may reduce genetic variability. Large rosinweed seeds, for example, may not go through a 1/4-inch screen, but smaller rosinweed seeds will. Using a 1/4-inch screen in this case would not be advisable.

Sifting

Sifting is the final screening step. Use a screen with pores just smaller than the seed to allow dust, broken seeds, etc. to fall through and yet retain desired seed on the screen. For example, most compass plant seeds won’t fall through a 1/4-inch screen, but smaller bits of plant material will, especially the ‘straw.’

Screening

Screening is the final cleaning step. Any screen can be used to sift through seeds, etc. to separate by size. Any screen can be used to sift through seeds, etc. to separate into various size classes. Key points to consider when selecting screens:

- Screen should be made of material that will allow air to pass through.
- Screen should be the appropriate size for the material being sifted.
- Screen should be free of holes or tears.

Types of Screens

1. Airflow Screens
2. Gravity Screens
3. Sifting Screens
4. Scalping Screens

Airflow — Sifting

Sifting is the process of removing larger, lighter objects from seed material. It is used to separate the desired seed from larger debris such as branches, leaves, and stalks. Sifting is done by pouring the seed material into a sifting box and allowing air to blow through it. The size of the screen used will determine the size of the debris that is removed.

Airflow — Winnowing

Winnowing is the process of removing lighter debris from seed material by using air. This is done by spreading the seed material on a wide, flat surface and blowing air over it. The lighter debris will float away, leaving the desired seed behind.

Airflow — Aspirating

Aspirating is a process used to remove fine debris from seed material by using a vacuum cleaner. This is done by vacuuming the seed material through a fine mesh screen. The fine mesh screen allows the desired seed to pass through, while the finer debris is removed.