



TIPS ON COLLECTING, PROCESSING AND STORING SEEDS OF ALASKA NATIVE PLANTS

by
Dr. Patricia S. Holloway
Associate Professor of Horticulture

TIMING

Know the life cycle of the plants you are interested in collecting. The timing of seed collection must coincide with seed maturity. It is important to know how and when seeds mature so that collection efforts are optimized, and the seeds will have the greatest chances of germinating.

Numerous species have seed maturity patterns that last for many days or weeks, whereas others mature at one time. The arctic lupine (*Lupinus arcticus*) has a raceme on which seed pods mature from the bottom up. By the time the topmost pod has matured, the lowermost pods have shattered, scattering seeds everywhere. The wild geranium (*Geranium erianthum*) also has a similar explosive seed dispersal mechanism, making timing of collection critical.

Seeds with explosive dispersal mechanisms may be collected in large quantities by enclosing the developing fruits in cheesecloth or nylon stocking (knee-hi's) bags. Enclose the entire fruit, pod or raceme in the bags just after flowers have dropped and fruit development has begun. Secure the bags to the stem with a twist-tie. The stocking bags work best in areas of low rainfall. They tend to get soggy when continuously wet, and the enclosed seeds rot. Return to the plants after seeds have matured, and break off the stem just below the bag. Seeds can be transported in the bags or removed.

Collection bags have an added benefit of acting as a barrier against insect attacks. Lupines are especially prone to destruction by insects. The bags prevent larvae from destroying the seeds. One problem with the bags is the need to return to the site weeks later to collect the seeds. Avoid using paper or plastic bags for this purpose. Paper bags exclude light and can fall apart before seeds mature, and plastic bags can become stifling mini-greenhouses where seeds rot rather than mature.

SEED MATURITY

Determining seed maturity is the most difficult stage of seed collection. There is no substitute for experience and observation in judging when to collect seeds. Professional seed collectors have devised some sophisticated methods for determining seed maturity. They include such methods as seed maturity-moisture curves and specific gravity tests. These methods are not very useful in remote field sites, but do have value for large-scale commercial harvest of wild seeds.

Probably the most useful tool is color. Seeds or seed pods may change from green to brown; fruit may mature from yellow to red; certain seed coverings may change from a light brown to dark brown; and still other seeds or fruit show no change at all. A thorough knowledge of fruit and seed development is necessary to take advantage of these color changes. Terrestrial orchids are one important exception to harvesting at peak maturity. Capsules and seeds should be harvested at a slightly immature greenish-brown stage for optimum seed germination.

Another indicator of seed maturity is the "ripeness" of the endosperm and embryo. Two very broad stages of seed maturity include the soft dough and hard dough stages. Break open a

seed with your fingernail, and squeeze the seed between your thumb and forefinger. If the “dough” is soft, pliable, and oozes out of the seed covering, the seed is not mature. If the “dough” is hard and nutlike, the seed is probably mature.

COLLECTING

Only fleshy fruits such as berries should be collected into plastic bags. All other fruits and seeds should be collected into paper bags. Plastic bags hold too much moisture, and seeds may rot. Also, some plastic bags develop a surface static charge causing seeds to stick to the bag. If seeds are very small, double bag the seeds or fruits to avoid losses.

Large seeds such as wild iris (*Iris setosa*) may be separated from the capsule at the time of collection, but for many small-seeded plants, it is easier to collect entire fruits or fruiting stalks. The more herbaceous material that is collected, the greater is the need to provide good air circulation to prevent rotting. Large quantities of herbaceous material also dictates more extensive cleaning following collection.

Keep records of species identity, collection date and location, site characteristics (especially soils) evidence of disease or insect damage, and plant health.

CLEANING

After collection, fleshy fruits should be frozen, or the seeds should be extracted using a blender. Subsequent seed germination can be influenced by the methods used in processing seeds after harvest. Lingonberry (*Vaccinium vitis-idaea*) seeds germinate readily if sown immediately after extraction from fresh or frozen fruits. Air-dried seeds, however, become dormant and require a period of cool, moist stratification for optimum germination.

Plants with dry fruits should be thoroughly dry before storage. Spread out the fruits, plants, etc. on newspaper or a tray (shallow lunch trays with sides are ideal). After the plant material is dried, it may be stored as is, but storage is less bulky if plant materials are threshed. The specific process is determined by the particular seed but involves rubbing the plants, fruits, etc. against a screen to dislodge the seeds and remove the trash. Soil sieves, professional seed-cleaning sieves, many kinds of coarse screens or mechanical threshers may be used. A common practice is to use two screens, one with larger openings and one smaller than the seeds. Seeds fall through the large openings, whereas the larger trash remains in the sieve. Seeds are caught in the small screen, while smaller trash falls through.

Cones of spruce and other conifers are air dried on trays then shaken in a box or cone tumbler to dislodge the seeds. If seed extraction is difficult, cones may be soaked in water until they close, then re-dried. Plants with serotinous cones such as lodgepole pine (*Pinus contorta*) require high temperatures up to 77°C (170°F) in order to extract the seeds from the cones.

After threshing, seeds may be clean enough to sow, or they may require further processing by cleaning and separation. This process varies with the species. For instance, the wings on spruce seed are often rubbed off to facilitate sowing. Awns on grasses may be removed. Large seed lots are usually processed through an air-screen cleaner that separates seeds by size, shape and density.

STORAGE

Most Alaska native plant seeds require cold, dry storage to maintain optimum viability. The survival in storage is species specific ranging from a few days for many spring-maturing willow seeds to thousands of years. For short-term storage in a refrigerator (1-4°C; 34-40°F), seeds may be stored in plastic bags; in paper packets that are then enclosed in plastic bags; in glassine envelopes; or in metal, glass or plastic jars. Seeds may also be frozen in air-tight and moisture-tight containers for longer-term storage. Seeds of many aquatic species such as water lily (*Nymphaea tetragona*) cannot tolerate drying. These seeds are best germinated immediately or refrigerated for short periods of time between sheets of moist paper toweling or filter paper.