

## SPECIAL PROCESSING TECHNIQUES OF HARDWOODS AND SHRUBS

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This topic is approached with all the confidence of one looking for a snail darter in the Pacific. Each one of you has some special process of harvesting, cleaning, storing, etc., of your special type of seeds and what may seem commonplace to you is very "special" to someone else. No doubt there will be some duplication of ideas or methods in this presentation, and hopefully, you will bear with me. This will be reasonably short with time for you to share your ideas with the rest of us.

We grow 25 - 50 species of trees and shrubs and our methods may be crude. If you have improvements, let's have them. We either seed in the fall or early spring. Some of the seed is stratified, some water soaked and some dry. With some species our early spring stretches into late summer. Anyway, let's look at some pictures of equipment and methods:

(Slides shown included high lift buckets, seed catchers (sacks and brooder frames), step process of Dybvig cleaner, dryers, dehullers, processing hardwood cuttings and step process of basswood (T. Americana) preparation for seeding.)

A number of the people contacted prior to this talk sent in ideas and slides to help out. Most said, "Good Luck." I have included a list of helps with this report that may be of specific help to some of you. Much of the material sent to me or that I dug out was without copy permission and I hesitated to include it. However, if you have a specific request, write to me and I will be happy to assist you, if possible.

The harvest of shrubs or hardwood tree seed should follow the same selection rules as for conifers, avoiding orchard types and other obvious deficiencies. Methods used for harvest include hand-picking, picking into baskets or hoppers, knocking seed into containers or on a canvas spread beneath, vacuum cleaners, sweeping streets, catching wind dispersals with nets, cutting or pruning and spreading branches for seed fall on truck boxes or floors, beating or stripping pruned branches (this works particularly well with spiny shrubs), or just plain purchase of fruit or seed.

The cultivation of shrubs for seed has much merit and can be very productive. It can be lost due to frost, hail, etc., in localized area, but if that happens one can always go to the wild for a season or fall back on reserves.

The time of collection is critical on many species and should be monitored closely. Use the same cutting test - inspection ideas as for conifers. Watch out when buying seed locally that it hasn't been cooked in the jelly making process.

Cleaning varies with the species. Methods include:

1. Depulping with a macerator, blender, hand rubbing through a screen, or some other machine such as a large commercial mixer.
2. Drying on screens or in a dryer (mice can carry away a considerable amount in a short time)
3. Dewinging with a hammermill, combine or plot thresher
4. Screening with commercial machines or a series of screens
5. Threshing is accomplished by beating, using various types of mechanical threshers, hullers or rubbing bars. The hammermill can also be used. If using a hammermill, a low RPM and constant full feed is essential to minimize cracking seed.
6. Floating is used on many seeds to separate seed from leaves and other foreign material prior to cleaning by the machine and following the cleaning, to separate hollow seeds and other debris from the good seed.
7. Fanning by a small mill is usually used to accomplish final cleaning before storage. In small lots winnowing by hand is satisfactory.

Proper storage of seed will no doubt be covered by others at this conference. Suffice it to say that storage of seeds to maintain viability varies with the specie and no one rule covers all - - check references or contact the Eastern Tree Seed Laboratory.

Vegetative material for propagation is another ball game. There are many good references on rooting, misting, etc., of plant propagation. You may not find anything on the particular specie you plan to grow. The local horticulture department of your state university is a good place to start. Again, the common sense handling and sanitation approach is the best.

One year old hardwood whips with adequate stem moisture, cut and processed with minimal injury and minimal drying prior to storage is important. There is also a minimum and maximum size for cuttings to be grown out as rooted cuttings in one season and another for the planting of non-rooted cuttings in the field. These sizes could be different for the various areas of the country.

Softwood cuttings gathered for misting are a common method of propagating many commercial varieties and procedures for this are available in many textbooks and pamphlets. The university is a good place to start. After all research is completed, you may decide to contract your needs. Good luck!

Equipment and applies for Collecting, Processing, Storing and Testing Forest Tree Seed - U S. Department of Agriculture, Forest Service General Technical Report SO-13

Propagation from Seed by C. E. Heit - Found in August 15, 1967 issue of American Nurseryman (a continuing series)

Culture and Mechanical Seed Harvest of Fourwing Saltbush Grown Under Irrigation - James R. Stroh and Ashley A. Thornburg - Journal of Range Management, Vol. 22, No. 1, January 1969, pp. 60-62.

'Ram-Red' Harvest Techniques CE-3-75 - Cape May Plant Material Center Annual Technical Report 1975 - Box 236-A, RD#1, Cape May Court House, New Jersey 08210

Mojave Revegetation Notes Agronomy & Range Science, University of California, Davis, CA.

Collecting, Processing, and Germinating Seeds of Western Wildland Plants by James A. Young, Raymond A. Evans, Burgess L. Kay, Richard E. Owen, and Frank L. Jurak. Available from Dr. James A. Young, SEA-USDA, 920 Valley Road, Reno, Nevada 89502.

Intermountain Shrub Science Laboratory, USDA, U. S. Forest Service, 735 N. 500 East, Provo, Utah 84601

Seeds of Woody Plants in the United States, USDA-Forest Service, Agriculture Handbook No. 450

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Research Branch  
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Plant Propagation by John P. Mahlstedt and Ernest S. Haber, Iowa State College

Propagation of Trees, Shrubs and Conifers by Wilfrid G. Sheat

Plant Propagation Principles and Practices by Hudson T. Hartmann and Dale E. Nester

The U.C. System for Producing Healthy Container-Grown Plants - Manual 23, California Agricultural Experiment Station-Extension Service

Eastern Tree Seed Laboratory  
P.O. Box 819  
Macon, Georgia 31202

The following is correspondence received from David E. Vanstone, Research Scientist, Research Station, P.O. Box 3001, Morden, Manitoba, ROG 1J0.

The following description lists our method of handling basswood seed and a brief rationale for why it is handled in this way:

1. Harvest when mature green (pericarp is just beginning to brown). Wilbert Ronald has studied collection dates for several years.
2. Dehull the seed - The hull (pericarp) should be removed because it somehow slows down and possibly restricts germination, but more importantly it prevents us from treating the seed coat which lies underneath. We have adapted a buckwheat dehuller for effectively removing the basswood hull. The dehuller consists basically of two grindstones, one stationary and one turning, which rub the dry hull from the seed. Dried seed dehulls better than damp seed. At present we are working on ways of drying the pericarp without drying the entire seed. A brief soak in alcohol and then air drying may accomplish this requirement.
3. Treat the seed coat with sulfuric acid - Sixty minutes of exposure to concentrated sulfuric acid tends to soften the seed coat. This will not render it permeable to water yet, but it seems to help. Any further acid treatment presents the risk of damaging the embryo.
4. Stratify the seed at 5 degrees for 7 months - seven months seems like a long time, yet better germination is likely with this treatment than with any other treatment.
5. Sow the seed into a moist but well-drained seed bed.

6. Expect prompt germination, up to 80%.

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(Correspondence from: C. G. Davidson, Head, Production & Maintenance Section, Tree Nursery, P.F.R.A, Indianhead, Sask.)

Seed Storage and Processing

| Species        | Approximate Harvest Dates | Storage Technique         | After-Ripening Treatment   | Comments                                     |
|----------------|---------------------------|---------------------------|--|--|
| Green ash      | Aug. 15 +                 | Not refrigerated          | 90 days in moist sand or peat at 5°C   |  |
| Buffaloberry   | Sept. 1-5                 | (1)                       | 90 days at 5°C (sand between peat) <sup>(2)</sup>  |  |
| Caragana       | Aug. 15-30                | Not refrigerated          | 15 days at 5°C (sand between peat)   |  |
| Chokecherry    | Aug. 10-20                | (1)                       | 90 days at 5°C (sand between peat)   |  |
| American elm   | June 1-5                  | (1)                       | 15 days at 5°C (sand between peat)   | 40% moisture content required before harvest |
| Lilac          | Sept. 10-15               | (1)                       | 30 days at 5°C or 10 days drip soak  |  |
| Manitoba maple | Aug. 15 +                 | Not refrigerated          | 90 days at 5°C (sand and peat)   |  |
| Oak            | Aug. 15 +                 | Stored at 2°C, fresh seed | 60 days at 5°C in moss   |  |
| Russian olive  | Sept. 1-5                 | (1)                       | 30 days at 5°C or 15 days soak drip  |  |
| Siberian elm   | June 1-5                  | (1)                       | 15 days at 5°C (sand and moss)   | 40% moisture content required before harvest |
| Japanese elm   | June 1-5                  | (1)                       | 15 days at 5°C (sand and moss)   | "  |
| Saskatoon      | July 1-5                  | (1)                       | 10 minutes H <sub>2</sub> SO <sub>4</sub> and 90 days at 5°C                                 |  |
| Dogwood        | Aug. 15 +                 | (1)                       | 60 days at 5°C (sand and moss)   |  |
| Honeysuckle    | Aug. 1-5                  | (1)                       | 30 days at 5°C or 10 days soak   |  |
| Rose           | Sept. 10-20               | (1)                       | 1 hr. H <sub>2</sub> SO <sub>4</sub> + 90 days <sup>or</sup> 120 days at 5°C (sand and moss) |  |
| Red elder      | Aug. 15 +                 | (1)                       | 90 days at 5°C (sand and moss)   |  |
| Siberian crab  | Sept. 1-5                 | (1)                       | 30 days at 5°C (sand and moss)   |  |
| Seabuckthorn   | Sept. 20 +                | (1)                       | 90 days at 5°C (sand and moss)   |  |

(1) Seed Storage - store seeds at 6-8% moisture in sealed poly bags at 0°F.

(2) Sand and moss - seed placed in layer of sand surrounded by moss to permit easy removal of seed.