CHAPTER 6
BUYING, HANDLING, STORING AND DISTRIBUTING

Bags of acorns recently removed from cold storage. Woven bags are preferred for short-term storage.

INTRODUCTION

Regardless of the source of seeds or nuts—local collections, another District, other in-state collector, or an out-of-state supplier—a local plan will be needed for buying (and selling), handling, storing, and transportation.

This chapter will provide the basics for addressing these issues on a statewide basis. It is hoped that SWCD's will view direct seeding as a way to help cooperators complete their conservation plans and provide an opportunity for the SWCD's to gain additional income for their overall program.

As SWCD's develop their seed collection programs, it is hoped that a networking arrangement can be set up. Eventually, a single statewide price list could be developed annually. Storage facilities could be located and shared regionally.

Handling, transportation and storage must be carried out under a set of uniform guidelines to assure that the quality of seed collected and purchased remains high until it is planted. Subsections that follow will expand on these issues. This chapter will include a section on quick tests to assure seed quality. Included are several key references. The Appendix will include price lists to guide purchase of nuts and seeds (updated annually), lists of collectors (whether local, in-state, or out-of-state) and, if available, lists of storage locations with cost of rental.

ESTABLISHING PRICE LISTS

Price lists for buying and selling should be developed or assembled annually. The Direct Seeding Coordinator will lead this activity and assure that county lists are developed and shared statewide. Normally prices will vary depending upon whether seed is purchased from sources that are local; within state, but out of county; or from commercial vendors.

It is the intent of this section to cover all seed purchase opportunities because each SWCD may operate differently. The expectation is that at least some of the needed nuts or seeds will be locally collected for local use or resale to other Districts. All price lists developed should be exhibited as part of the Appendix.

Three types of price lists could be developed:

1) Local County Price List for _____ County, Illinois.

This list should include all the species that the SWCD will buy during the year for local use or for resale to other Districts or to contractors. This list will include a "price paid" column per pound of seed and a "resale price" column. Quality expectations will be developed and provided to collectors. However, the purchaser is advised to apply the simple tests that follow to assure quality before purchase is completed.

2) Out-of-County Price List for _____ County, Illinois.

Since local needs cannot always be met by local collections, it will be necessary to determine a fair price to pay another SWCD to collect, handle, store, and transport tree seed. Ideally, this list will be accepted by SWCD's statewide.

The out-of-county list will include all of the species listed in Chapter 3 and contain a price per pound for each. Prices may be only 10 to 25 percent higher than the average price paid to local collectors. This would promote collection and provide the collecting SWCD with an income opportunity. The SWCD buying the nuts or seeds would need to pay for or provide transportation of seed.

3) Commercial Vendors Price List.

A list of commercial seed vendors is provided in the Appendix. Commercial sources will generally charge the highest prices and will always include additional costs for shipping and handling. All price lists should be updated on an annual basis.

Handling and Storage Requirements by Species

Proper handling and storage is essential for keeping high quality seed viable, whether for a short time or an extended period. This section is developed for the species that are listed in Chapter 3. Other locally important species may be added. The references listed may be used to help you obtain any pertinent information needed for additional species.

Determine how seed was handled and stored before purchase. An advantage to local seed collection is the ability to control handling and storage.

General Rules of Thumb

1) Tag or label all seed bags to indicate date, location of collection, species of seed, weight, and name of collector.
2) Plant as soon after collection as possible, particularly the white oak family.
3) Most nuts and seeds should be kept cool and moist.
4) Float, sort and cull to reduce volume immediately after collection.
5) Dry or soak and bag as directed by the following species criteria.
6) Most species will need a period of "stratification" (covered later) to cause seed to break dormancy if not fall seeded.
7) The longer stored, the greater the loss of viability.

Handling and Storage Specifics

Green Ash

Handling
Air dry in shallow, screen-bottomed boxes or trays. Stir every few days until dry. Rub dried clusters or flail sacks of clusters to separate stems and trash to prepare for seeding or storage, screen or air separate seed from trash (optional).

Storage
After air drying, place seed in sealed containers at a controlled temperature of about 40°F.

Stratification
When not fall seeded, the seed must undergo pregermination treatment of warm-cold temperatures to overcome internal dormancy and seedcoat effects. Pre-chill seeds at 32 to 40°F for 90 to 120 days then let warm to about 70°F for 60 days before planting.

White Ash

Handling
Same as green ash, but leave seed in trays longer for embryos to grow.

Storage
Same as green ash.

Stratification
Same as green ash, except: pre-chill seeds at 40°F for 60 days and warm stratify at 70to 80°F for 30 days.

Baldcypress

Handling
Spread cones in trays to dry. Once dry, break cones apart by flailing or trampling. Separation of cone fragments from seeds is very difficult, and they are usually sown together.

Storage
Store dry at about 40°F if not fall seeded.

Stratification
Spring seeded baldcypress needs pregermination treatment. Soak the seeds in water at about 40°F for 90 days or use 90 days of cold stratification preceded by a 5 minutes soak in ethyl alcohol.

Black Cherry

Handling
Place in shallow trays. Rub and wash to separate skins and pulp from seeds as soon after collection as possible to avoid heating and molding. Do not dry excessively.

Storage
If not fall seeded, store dry in sealed containers at about 40°F.

Stratification
Place seeds in a moist medium (mixture of sand and peat) at a temperature of 37 to 40°F for 120 days prior to spring planting.

Hickories *all*

Handling
Separate husks from the nut. Allow to air dry then plant or store.

Storage
Place all hickory species except shagbark in closed containers in a cooler at about 40°F and low humidity. Shagbark should be stored at about 36°F.

Stratification
Since all hickories exhibit embryo dormancy, they must be pre-chilled in a moist medium at 36 to 40°F for 30 to 150 days.

- *Water and bitternut for 90 days*
- *Pignut and Shellbark for 120 days*
- *Mockernut and shagbark for 150 days*

In lieu of the above, use pit stratification over winter. Soak nuts in cold water at room temperature for 2 to 4 days with 1 or 2 water changes per day. Place in a pit and cover with soil compost or leaf litter about 2 feet thick. Protect from predators over winter. In spring, dig and plant.

Oaks *White oak group*

Handling

Discard caps and other debris. (Note that bur and overcup caps will not normally separate from the acorns. Process with caps on.) Soak acorns in water for 4 to 24 hours. With the exception of bur and overcup, keep the seeds that sink, and discard the floaters. (Expect all bur and overcup acorns to float, and sort by hand.) Plant as soon as possible or bag and keep in a cool, moist place until planted or stored.

Storage

Note: The white oak family does not store well since they begin to germinate almost as soon as they mature. This includes: swamp white, white, bur, swamp chestnut, overcup, and chinkapin oaks. Moisture content must be maintained during storage. Soak seed for 4 to 24 hours then place in sealed 1.75 mil plastic bags at about 35°F.

Stratification

Stratification is not needed as the embryo has little or no dormancy and germinates almost immediately after seed drop.

Oaks *Red Oak Group*

Handling

See same comments as for white oaks.

Storage

Storage is possible. Make sure moisture does not fall below 20 to 30 percent. Place in 4 to 10 mil bags and seal. Keep in cooler or refrigerator at about 34 to 40°F.

Stratification

Fall planting at the same time white oaks are planted is best. The conditions recommended above will suffice or place in a moist sand mix for 30 to 90 days.

Pecan

Handling

Same as for hickories.

Storage

Place in a closed container in a cooler at about 36°F.

Stratification

Pre-chill in cooler in a moist medium for 30 to 60 days or use pit stratification as described for hickories.

Persimmon

Handling

Place collected fruit in shallow trays that have a ¼ inch mesh hardware cloth bottom. Rub or mash fruit to separate from seed. Wash out pulp and retain seeds. Spread to dry for a couple of days.

Storage

Dry seed should be stored in sealed, dry containers at about 40°F.

Stratification

Natural germination occurs in April or May, but the hard seedcoat may delay germination 2 to 3 years. Seed dormancy treatment may be broken by pre-chilling 60 to 90 days.

Sycamore

Handling

The seed balls should be placed in trays to dry, after which the seed may be easily rubbed from the heads. Removal of the tawny hairs, accomplished by rubbing over screen, will facilitate sowing. Always wear a mask when separating and cleaning.

Storing

Leave balls intact when collecting and store in onion sacks in a cool, well-ventilated place or spread out on shelves. For long term storage (more than 1 year) dry seeds to 10 to 15 percent moisture, seal in airtight containers at 20 to 38°F.

Stratification

None needed.

Tuliptree *Yellow-Poplar*

Handling

Cones should be placed in shallow trays to dry 7 to 20 days. Once dry, use any practical method to break apart the cones and separate the seed from debris.

Storage

Seal dry seed and store in the refrigerator at about 40°F or store in moist sand at 36°F.

Stratification

Cold moist stratification in plastic bags at 36°F for about 140 days works well to break dormancy.

Black Walnut

Handling

If hulls are to be removed, do so before they dry. Remove by hand, foot, corn sheller, or other safe mechanical method. Place in container, pressure wash, float off bad nuts, and then spread to dry. Nuts can be planted with hulls on but are more bulky and difficult to work with. Keep in a cool area protected from rodents.

Storage

It is best to fall plant because of bulk. If storage is necessary, use an outdoor pit where nuts can be spread, buried under about 2 feet of soil and straw, and stored over winter. Protect stored area from predators by enclosing with wire mesh. Cover the wire mesh with a paper or cloth barrier to facilitate retrieval in spring. Walnuts can also be stored for at least a year by soaking, placing in sealed plastic bags, and refrigerating at approximately 35° F.

Stratification

It is necessary to provide 90 to 120 days at about 37°F to break seed dormancy. Small lots can be pre-chilled in plastic bags in sand or peat in a cooler for the 90 to 120 day period.

Simple Tests to Assure Quality

Inspect all seed to be sure that it meets or exceeds the standards set in the IL-NRCS Woodland Direct Seeding standard (652). Never accept or sell poor quality seed.

You should inspect each species individually for:

1) Documentation sheet by lot completed and signed by seller.
2) Appearance: clean, insect free, undamaged, proper color, moist or dry, etc. Acorns may often have 1 insect hole and up to ¼ of the acorn consumed by insects and still be viable.
3) Condition: crack or cut at least 10 nuts to determine freshness, color, moisture, viability, and presence of mold or insects. Acorn color should be white or creamy yellow, except for pin, cherrybark, and willow oaks, which will be dark yellow to orange. Record percent failing inspection and the reason. See the references listed for this chapter for more information.

Transportation and Delivery Requirements

This section addresses the issue of transport and delivery of fresh and/or stored seed to the client who is buying it to plant or to resell. Locally collected seed is advantageous because handling and storage can be readily monitored. Always buy high quality. Anyone selling seed must be able to provide:

1) Date seed was collected
2) Name of the party who collected the seed
3) Location of the seed trees (county, state)
4) Information on how the seed has been handled since collection (storage conditions and whether seed is stratified).
5) Description of general seed condition and appearance
6) Cost of seed when delivered or picked up
7) Right of return if misrepresented
8) A written sheet that provides the above documentation.

If you are selling seed to a client you will need to sell high quality, viable seed that has been properly cared for during and after collection. Provide complete documentation to all buyers as described in items 1 through 7; this is a statement of quality.

REFERENCES

Seed Biology and Technology of Quercus. 1987. GTR-SO-66. USDA-Forest Service, So. For. Exp. Sta., New Orleans, LA. 21 pp.

Seed Collection Manual. Circa 1980. Illinois Department of Natural Resources, Division of Forest Resources. 23 pp.

Seeds of Woody Plants in the United States. 1974. Agricultural Handbook No. 450. USDA-Forest Service. 883 pp. Available on the Web at: http://wpsm.net/

OR

Seeds of Woody Plants in North America. 1992. Young, J.A. and C.G. Young. Dioscorides Press. 407 pp.

NOTE: *Copies of all of the above are available for up to a 2-week loan from the NRCS State Agroforester. Some references may also be available from IDNR District Foresters, the IDNR Forest Management Staff Forester, and the State Cooperative Extension Forester.*