

Tree Seed Collection and Storage

By Jerry Hopkins

Millions of years ago one of nature's most successful reproductive strategies began to develop with the emergence of flowering plants: produce lots of offspring, pack them in protective vessels and exploit any distribution mechanism that increases the chance that some of the offspring will land where they can grow. The large number of offspring that can be distributed in this manner overcomes the best efforts of predators and allows for the variety of conditions on the ground. We are, of course, talking about seeds. The fact that this planet is virtually covered with plants is evidence of the success of this reproductive strategy. Some will always make it.

In forest management, natural regeneration or simply allowing the trees to reproduce is also a successful strategy in establishing a stand of trees. In fact, in the Midwest, and throughout the eastern forest region, most regeneration is accomplished this way. Natural regeneration produces a lot of trees, which are subsequently available for other management practices to produce the desired density.

There are many times, however, when a more controlled and focused planting approach is desirable. Artificial regeneration using nursery seedlings or by direct seeding may be considered when a target species mix is needed.

In the nursery environment there is a lot of science involved in seed collection, processing and storage. A few guidelines will help the individual woodlot manager who chooses to use the direct seeding method. For this discussion we'll look at large seeded species such as oak (*Quercus* sp.), buckeye (*Aesculus* sp.) and black walnut (*Juglans nigra*). All conifers and most small seeded species of hardwoods require an extraction process and, in addition, may require pre-germination treatments.

Start with a plan.

It's important to know what should be growing on your woodlot. The Division of Forestry's service foresters can provide the expertise in setting goals, developing the plan and choosing the right species mix for a given location. For example, it may make little sense to plant Bald Cypress on land that is most suitable for White Oak.

Obviously, for direct seeding, one of the first considerations is the availability of seed. A key point is to use seed from trees that are genetically adapted for the planting area. For the woodlot owner, the logistics of scouting and collecting can be a burden if the distance to the seed source is too great. And the genetic adaptation to the site will be more favorable from a nearby seed source.

Choosing a collection area.

The first step in choosing a collection site is to be sure that you have permission to be there if you are not the owner. After securing permission, look at the stand objectively. Be certain that the trees are properly identified and are indeed the desired species. Seed should be collected from healthy, vigorous trees of reasonably good form that are making average or better growth. Nearly mature trees that have fully demonstrated their capabilities on the site are most desirable. Avoid collecting in stands that contain numerous poorly formed, abnormal or diseased trees. Lone trees that lack the potential for adequate cross-pollination should also be avoided.

Scouting the seed crop.

Scouting allows the collector to forecast the size of the seed crop and make an initial estimate of the quality of the seed. This information is needed to plan for the collection of the seed, especially when a number of species are to be collected from multiple sites. For the large seeded species in this discussion, forecasting can be done from early July through early September. At this time the fruits (nuts or acorns) will typically be about half the mature size. This is also a good time to determine if any pre-collection work needs to be done, such as brush clearing or mowing under the crop trees.

Collecting the seed.

Timing is critical. The seed collector who wants to plant the seed is often competing with seed collectors who want to eat the seed. And they are very good at it. In general, when seed begins falling from the tree it is ripe or nearly ripe. Seed that has been attacked by insects may fall first and may be ignored but after a few days the remaining seed is likely to be ripe enough to use.

The seed should not be placed in plastic bags or other airtight containers, nor should the bags be stacked. This is organic matter that will begin heating up like a compost pile without adequate air circulation and the heat will damage or kill the embryos in the seed.

Storing the Seed.

Usually the seed is ready to plant when it is disbursed. In other words, the tree drops seed at the right time for the seed to be planted. When this is not possible or at least not practical, the seed may be stored temporarily. Seed should be stored at 32 to 34 degrees Fahrenheit. The cooler temperature slows metabolic activity and helps preserve the germinative capacity of the seed.

Without cooling facilities the seed may be spread in thin layers on screens in a shady location with good air circulation. Acorns are especially sensitive to drying out, so this method is good for just a few days. If the acorns were on the ground for

several days before being collected they can be soaked in water for two to four hours before spreading on the screens. Soaking will also separate the seed into "floaters" and "sinkers." The acorns that sink will usually be the best undamaged seed, although many of the acorns that float will still grow. Buckeye seed should be removed from the husks, and walnuts may be planted with or without husking. For reference, planting depth should be about twice the diameter of the seed.

Establishing a woodland habitat can be achieved by different methods. Natural regeneration is one way that has worked for millennia. However, when a more directed approach is needed to accomplish specific management goals, artificial regeneration is a proven way to exert greater control over species composition and density. The greatest control is achieved by transplanting nursery-grown seedlings, but the economics of forest management may require alternatives. A combination of various methods may be the optimum solution. Contact your Division of Forestry service forester for more information on forest management, direct seeding or regeneration with native seedlings.

For in-depth information on seed science, go to:

<http://www.nsl.fs.fed.us/wpsm/index.html>

