

The Fine Art of Growing Trees from Seed

By Perry Brannan, ODNR Service Forester

Ohio's forests support over a hundred woody species, most of which typically reproduce by their seeds. Spread by wind, water, or animals, when a seed ends up in a spot with the right conditions, a tree gets started. Few seeds are lucky enough to get all the right conditions. With proper care, you can give seeds everything they need to grow into new trees on your land. The best methods for handling seed vary by species, but here are six essential guidelines.

Collect fresh seed. Most seeds fall from the tree when they are mature. Seed should be gathered under the tree or picked from the tree when natural dispersal has begun. Mowing or placing tarps under seed-bearing trees prior to seed dispersal makes collection easier. Seeds not collected promptly may lose viability. They could also decay or be eaten by animals.

Acorns and other nuts will not survive if they get too dry. Acorns of the red oak group usually drop from the tree in October. Acorns of the white oak group drop from the tree in September or early October. The white oak species sprout a root almost immediately if they are warm and moist. White oak seed that lies on dry ground in warm temperatures will begin to lose viability in a few days.

Keep only the good seed. Many tree seeds are non-viable right from the start, due to insect damage or stunted development. Seeds that won't grow should be sorted out and discarded whenever possible.

For most oak species, dead and badly damaged seeds should be separated from the good seeds by floating them in water. Hollow or dried-out seeds will float to the surface. The volume of water should be at least three times the volume of seed. Stir the seed for 2 to 5 minutes. Anything still floating should be skimmed off. Only seeds that sink should be planted.

Bur oak is an exception. Mature bur oak acorns don't always shed their caps as other oaks do. The caps will cause good bur oak seeds to float.

A simple method of checking seed quality is a cut test. Cut several seeds in half, and look at what's inside. The appearance of healthy seed varies by species, but generally they are solid white inside. Bad seeds are usually obvious, being hollow or containing rotten material.

Store clean seed in a cold place. Seeds are perishable and should be kept in cold storage until time for planting or pre-germination treatment. Small seed lots will keep in zip lock bags. Larger quantities require breathable containers, like burlap bags. For dogwoods, persimmon, and viburnums, the fruit should be removed. Husks of hickories and buckeyes should be removed. Removing the fleshy covering from walnuts is not necessary. An ordinary refrigerator provides ideal temperatures, 34 to 40°F.

Apply treatments to break seed dormancy. Seeds of most wild plants remain dormant after dispersal. Dormancy helps prevent seeds from germinating at the wrong time.

Most tree seeds will not germinate without certain physiological changes that must occur before the seed can grow. These changes occur slowly and only under certain conditions. For many species, lying in topsoil under a cover of leaves during a typical Ohio winter is their natural pre-germination treatment.

A common pre-germination treatment is cold stratification. Traditional stratification means layering seed within strata of sand or peat through the winter. The purpose of cold stratification is to keep the seed in cool, moist, aerobic conditions for 1 to 4 months. Temperatures should be from 34 to 40°F. Freezing is not helpful, since it prevents the biochemical processes necessary to break dormancy.

Seed should be fully hydrated before stratification by soaking in water for about 24 hours, then draining excess water. Seed put into stratification should be moist to the touch, but not dripping wet.

In the simplest type of cold stratification, a small amount of hydrated seed is placed in a thin plastic bag and refrigerated for the necessary duration. Better germination results from mixing seed with a moist medium such as sand or potting soil. The medium should be saturated first, and then squeezed like a sponge to drain out excess water. The volume of medium should be 2 or 3 times the volume of seed. Small batches can be stratified in plastic bags. Larger amounts require breathable containers with ample drainage. Flower pots work well. So do loosely woven bags on top of wood pallets. Successful methods must provide moisture without drowning the seed, allow movement of oxygen and carbon dioxide, and maintain cold temperatures.

Another pre-germination treatment is called scarification, which essentially means scratching the seed coat to allow for water absorption and exchange of gases. Scarification can be accomplished with a knife, sandpaper, or a file. Other means of scarification involve the use of acid, peroxide, or hot water. Scarification generally is necessary for seeds that are adapted to go through an animal's digestive system before germination.

Plant seed at the proper depth at the right time. For many species, the necessary stratification can be accomplished by planting the seeds outside in early autumn. Most seeds need planted at a depth about twice the thickness of the seed. One inch of mulch over the seedbed protects the seeds from drying and freezing during the winter. Proper soil moisture during the germination period is essential.

Protect seed from animals. Any place where seed is planted, stored, or stratified should be protected from squirrels, mice, and deer. Seedbeds can be covered with screens, which must be removed before germination. An enclosure of ¼-inch hardware cloth works for small plantings.

Collecting and planting tree seed can be entertaining and very rewarding. With proper care and a little luck, direct-seeding can establish small areas of forest cover. Missing species can be re-introduced with little or no money out-of-pocket. Specific practices for handling seed of almost any woody species can be found at <http://www.nsl.fs.fed.us/wpsm/Genera.htm>

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Photo caption:

One year old white oak seedlings planted by the author in October 2005. White oak yielded a bumper crop of acorns in 2005.



Seedlings from White
Oak acorns planted C