Growing Your Own Oak Seedlings

Many people have emotional attachments to specific trees—the live oak that shaded the schoolyard, the scarlet oak next to Grandfather’s barn, or the Giles bur oak on the Mississippi State University campus. It is easy to grow oak seedlings from acorns collected from your special tree.

Collecting acorns and growing seedlings makes a fine school project for kindergarten or elementary students. Charities or special interest groups can grow and sell seedlings from a memorable tree as a fund-raising project.

Neighborhood groups can grow seedlings to plant trees along streets and in common areas. Landowners who want a few oaks for wildlife habitat, shade, or aesthetics might want to grow their own seedlings for transplanting.

Growing your own oak seedlings is as easy as 1-2-3: 1) Collect viable acorns; 2) Plant the acorns in a protected area; and 3) Transplant the seedlings to the desired location.

Collecting Viable Acorns

Many species of oaks can be found throughout Mississippi. They can be broken down into two broad categories: white oaks and red oaks. These categories can be determined generally by examining the lobes, or rounded projections, of the leaves.

White oak leaves have lobes that are usually rounded without bristle-tips, while red oaks have bristle-tips on the lobes. White oaks produce acorns in only 1 year, while red oak acorns take 2 years to develop.

The number of acorns produced varies greatly from year to year because changes in water, nutrient availability, and weather patterns greatly affect both oak groups. Because of the variability of seed production, adequate supplies of viable acorns may not be available every year for every species.

When there is a good acorn crop visible on the selected tree, follow these guidelines to increase your chance of collecting viable acorns:

- Don’t pick the acorns from the tree because these are immature and will not produce seedlings. Don’t pick the first acorns that fall to the ground because these also often fail to produce seedlings due to poor quality or damage.

- Collect more acorns than the number of trees you want to grow to allow for the usual rates of mortality. Don’t wait too long before gathering acorns because they are favorite foods for many rodents, birds, and other wildlife.

- Visually examine your acorn selection. Discard any acorns with rot, mold, or small holes. Holes may indicate insect damage.

- After your initial inspection, drop the acorns (except for overcup oak acorns) into a large container of water. Discard the acorns that float to the top because this indicates that the embryo has not fully developed or is damaged, and the seed is hollow.

- Discard acorns with obvious damage such as insect holes.

- Hollow acorns float when placed in water; these can be discarded.
Stratification
Once you have selected your acorns, the next step depends on whether the acorns are from white or red oaks.

Species in the white oak group can be planted almost immediately after you gather them, or they can be stored for up to 6 months following the same guidelines that apply to storing red oak acorns.

Red oak acorns need a period of cold storage to satisfy dormancy requirements. In the wild, acorns lie under leaves and debris on the forest floor for the cold months of the year, then germinate in the spring. The breaking of dormancy by the cold is called stratification.

You must mimic nature to make your red oak acorns grow. After washing any lingering debris from your acorns, drain them thoroughly, seal them in a plastic bag, and place them in the refrigerator. They can be left at temperatures slightly above freezing, with humidity above 30 percent.

Make sure the acorns do not dry out during storage, but do not let them sit in excess water. Too much moisture or too little moisture during storage will reduce their chance of germination. Species in the red oak group should be kept under these conditions for a minimum of 4 to 8 weeks and can be kept in storage for up to 2½ years.

Planting Acorns
White oak seedlings may be planted immediately after collection. Red oaks may be planted after stratifying the seeds in the refrigerator. Plant either type of acorn outside in a seedbed or in pots. It is much easier to use an outside seedbed because nature will provide the right conditions most of the time and watering will be necessary only during dry spells.

Growing Oak Seedlings in a Seedbed
An outdoor seedbed is a good way to produce a large number of seedlings at once. Select an area that is well drained and in full sun. Find a small space in a flowerbed that you could use for this purpose. Make sure the area is not subject to animal browsing. Deer are quite fond of young seedlings, as are moles, voles, rabbits, and other mammals.

Prepare the seedbed as you would any seedbed by tilling and incorporating organic material if improved drainage is needed. Plant the acorns about an inch below the surface—deeper if the acorns are particularly large. A good rule of thumb for most seeds is to have the planting depth three times the depth of the seed.

Water your seedbed thoroughly after planting. In several days or weeks, the seedlings will emerge from the soil. After germination, remove the smaller, inferior seedlings to encourage the development of the better seedlings. Make sure each seedling has enough space for each leaf to be in the sun. If rainfall is not regular, you should water the seedlings once weekly.

Growing Seedlings in Pots
Seedlings may also be propagated indoors by planting in containers. Select pots that are at least 1 foot deep to allow enough space for the roots to develop. The bottoms of the containers should have drainage holes.

Fill your containers with a mixture of half potting soil and half topsoil from your yard or garden. You can mix approximately 1 teaspoon of a slow-release fertilizer like Osmocote, Nutricote, or Nursery Special with the soil if you want. Plant several acorns three times the depth of the acorn.

Water once a week, but do not overwater because this can cause rot. About 1 week after the acorns germinate and seedlings emerge, remove inferior (smaller) seedlings, leaving only one dominant (largest) seedling in each individual pot. If you did not add a slow-release fertilizer to the planting mix, water with a liquid fertilizer, such as Peter’s or Miracle-Gro, at one-half the rate every 6 weeks.

The containers may be placed outside around April in a partially shaded location for 4 to 6 weeks to acclimate them to outdoor conditions. Then you can move them to a sunny location for maximum growth. You must water the pots if rainfall has not occurred for a few days.
Transplanting Seedlings

Do not disturb the seedlings until after several frosts have occurred. This may be in December or January for north Mississippi or as late as February for south Mississippi. The cold weather will harden off the seedlings so you can transplant them to their desired location.

Treat the transplanted seedling like any other plant: dig an appropriately sized hole, add organic matter if necessary to promote drainage, water, and mulch. You may want to plant two to three seedlings in the desired location and later remove all but the most vigorous.

In some areas, you might need to protect the seedlings from animal damage such as deer browsing. Fences or tree sleeves can help keep the seedlings from being destroyed. Seedling sleeves or shelters are available from forestry or garden suppliers.

Different species of oaks grow at different rates. White oaks may be as tall as 10 to 15 feet in 10 to 12 years. A water oak may grow as tall as 25 feet in 10 years, while a southern red oak may take 25 years to get that tall. The growth of a tree depends on the soil type, nutrient and water availability, and the amount of light it receives.

Beyond Oak Trees

Each species of tree has its own unique reproductive and seeding habits. You can modify the guidelines given in this publication to fit many different species of trees. Table 1 lists some common trees found in Mississippi and information on propagation.

This chart was created using information from two U.S. Forest Service Web sites relating to forest trees and seeds. One site contains the “Woody Seed Plant Manual” found at http://www.nsl.fs.fed.us/wpsm/. The chapters on seed propagation have good general—though very technical—information. You can find specifics on individual species by selecting the Genera link and selecting the desired species using the Genus. For instance, information on oaks is found in the Genus Quercus, pines in Pinus, cottonwoods in Populus, and so on.

“Agricultural Handbook 654 Silvics of North America” provides another source of information for those desiring to collect tree seeds and grow seedlings. Find this publication at http://www.na.fs.fed.us/spfo/pubs/silvics_manual/table_of_contents.htm. While the “Woody Plant Seed Manual” has information by Genus, the “Silvics” manual has information by species. Instead of learning about hickories (Carya) in general, you can select the particular species such as shagbark hickory (Carya ovata). The species are listed by both common name and scientific name.

Both books contain much information for teachers and students interested in biology, botany, and other similar fields of scientific study.

Especially for Students

Collecting tree seeds and propagating can be used for many school or science fair projects. Students can collect seeds from one or more trees to determine germination rates, weight and size variations, success from different stratification methods, comparisons of fall and spring sowing, comparisons of seedling development rates, and so on.

The two publications listed above can be a valuable resource for any budding young scientist. Science fair participants may benefit from reading “Keeping the Science in Your Science Fair Project,” a publication from North Carolina Agricultural and Technical State University Extension Service at http://www.ag.ncat.edu/extension/programs/dte/science.

Younger students will enjoy learning about the wide variety of seeds found in trees. Seeds can be used to learn a variety of skills such as comparisons, measurements of size and weight, and observations of color, texture, and smell. Children often enjoy growing their own special seedling to be planted at the family homestead. They may enjoy collecting seeds to establish an arboretum on the school grounds. Student groups may propagate seedlings and sell them for money-making projects or plant seedlings for community beautification.
Table 1. Seedling propagation from seed for selected common tree species in Mississippi (summarized from "Woody Plant Seed Manual" and "Silvics of North America").

<table>
<thead>
<tr>
<th>Common and Scientific Name</th>
<th>Seed Type</th>
<th>Collection Time</th>
<th>Seed Treatment</th>
<th>Stratification</th>
<th>Planting Guidelines</th>
</tr>
</thead>
<tbody>
<tr>
<td>Eastern Redbud</td>
<td>Fruit pods with 4-10 reddish brown seeds</td>
<td>After ripening—midsummer to fall. Pull from tree.</td>
<td>Immerse seeds in boiling water for 15 seconds, then soak in cool water for 24 hours.</td>
<td>Place stratified seeds in moist sand in refrigerator for 5-8 weeks.</td>
<td>Plant in seedbeds in early April at a depth of 0.25 to 1.0 inch.</td>
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<tr>
<td>Acer rubrum L.</td>
<td>Double samara (winged seed)</td>
<td>April to July. Seeds can be shaken or pulled from trees.</td>
<td>None needed.</td>
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<td>Plant seeds in moist mineral soil before the seeds dry out.</td>
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<tr>
<td>Persimmon</td>
<td>Berry with 1-8 flat, brown seeds</td>
<td>September to November. Gather fallen fruits from ground.</td>
<td>Store ripe fruits in plastic bags until pulp turns to juice and can be rinsed away. Air-dry 1-2 days.</td>
<td>Rinse seeds; store in plastic bag in refrigerator for 60-90 days. Soak seeds 2-3 days before planting.</td>
<td>Plant in spring or fall in shallow drills about 0.5 inch deep.</td>
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<tr>
<td>Cornus florida L.</td>
<td>Bright red drupe with 1-2 seeded stone</td>
<td>September to late October. When fruit can be squeezed and stone popped out. Strip or shake fruit from branches.</td>
<td>Soften fruit by soaking in water; skim off pulp and floating (empty) stones.</td>
<td>Store in plastic bag in refrigerator for up to 120 days.</td>
<td>Plant in fall after collection and cleaning; or stratify and plant in spring to a depth of 0.25 to 0.5 inch.</td>
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<tr>
<td>Sassafras</td>
<td>Dark blue drupe</td>
<td>Pick from tree or shake tree over sheets of plastic.</td>
<td>Rub fruits over hardware cloth to remove pulp and wash.</td>
<td>Store in plastic bag in refrigerator for 120 days.</td>
<td>Plant in rows 8-12 inches apart and covered with 0.25 to 0.5 inch of soil.</td>
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<tr>
<td>Magnolia grandiflora L.</td>
<td>Rusty, conelike fruits with red seeds</td>
<td>Pick from trees after fruit turns rusty brown.</td>
<td>Spread fruit to dry until seeds can be shaken out. Rub seeds over hardware cloth to remove flesh and rinse.</td>
<td>Fall sowing provides natural stratification; or store in plastic bags in refrigerator for 90-180 days.</td>
<td>Plant in rows 8-12 inches apart and cover with 0.25 inch of soil. Mulch. Seedlings need half shade during first summer.</td>
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<tr>
<td>Loblolly Pine</td>
<td>Female cones contain winged seeds</td>
<td>October to November. Collect cones when sample cones float in water or when fallen cones are just beginning to crack and release seeds.</td>
<td>Air-dry cones on trays. When open, shake or knock cones to remove seeds. Rub seeds to remove wings.</td>
<td>Cleared seeds may be stored in plastic bags in refrigerator for spring sowing.</td>
<td>For full sowing, press seed into mineral soil and cover with a layer of chopped pine straw.</td>
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