



Bottomland oaks are valuable timber species that are also important for wildlife, but regenerating them is about as easy as training blackbirds to plant acorns.



"The creation of a thousand forests is in one acorn."

—Ralph Waldo Emerson



Regenerating oaks
in BY DAN DEY AND JOHN KABRICK, PHOTOS BY JIM RATHERT
Missouri's bottomlands

In ancient Greek, Roman and Celtic mythologies, oak trees symbolized strength and virility. Oak groves were sacred places to Celtic and Druid cultures of the British Isles. Oak has long symbolized strength, endurance, military prowess, victory, royalty and fertility.

In addition to their symbolic, cultural and aesthetic values, oaks have also proven useful throughout history. Military and merchant sailing ships were built of oak. Because of its strength and endurance, oak wood was favored for building homes, crafting furniture and manufacturing household items. Charcoal produced from oak wood fueled the iron and glass industries in the 18th and 19th centuries. Oak bark, with its high tannin content, was important in the leather tanning process. Acorns have also provided nourishment for humans around the world.

Missouri once had an estimated 5 million acres of wetlands, much of which were bottomland forests that included some oak. Today, less than 15 percent of those historical wetlands remain in the state. Many landowners and public land managers are interested in restoring oak trees on the bottomlands of Missouri's rivers for wildlife and timber purposes. However, creating forests from acorns is not as easy as Ralph Waldo Emerson makes it sound.

Young oaks growing in bottomlands face serious chal-



Acorns are an important food to many wildlife species living in bottomland forests.

lenges. Seedlings must compete with the lush growth of other plants. Because oak seedlings grow slowly, they are often shaded out by Johnson grass, Reed canary grass, giant ragweed, marehail, cottonwood, willow and other fast growing species that are better adapted to colonizing bare, open bottomland fields.

In bottomlands, animal damage often limits oak regeneration. Squirrels and other small rodents eat acorns planted in forests or fields, and many wildlife species eat planted nursery seedlings. White-tailed deer can slow tree development for years by repeatedly browsing on the twigs and buds of seedlings. If they eat the terminal or uppermost bud they can prevent a tree from growing taller. In winter, cottontail rabbits may completely sever the stems of small oaks, or chew through the bark and cambium of larger seedlings, killing them. Mice, voles and other small mammals also damage tree seedlings.

It's important to properly match the species of oak with the soil and the flooding tendency of the planting site. Several oak species are native to Missouri bottomlands, but their ability to tolerate flooding varies. Bur oak, swamp white oak, Nuttall oak, overcup oak, water oak and willow oak do well in frequently flooded areas. Pin oak, Shumard oak and cherrybark oak can survive frequent flooding, but they don't thrive in these conditions. Despite its name, swamp chestnut oak won't grow well in swampy or wet ground.

Bottomland oaks are better able to survive and prosper when flooding occurs during their dormant season. They also fare better on well-drained soils on higher elevations in floodplains. Floods in the late spring, when trees have leafed out, can kill oak seedlings. This is especially true when flood waters are stagnant and flooding persists for a month or more.

Give oaks a chance!

Landowners can improve the success of oak regeneration in bottomlands. Using cover crops, such as redtop grass, sown at the time of oak planting, helps control competing vegetation. Redtop, a cool-season grass adapted to moist soil conditions, only reaches heights of 18-24 inches. Its sod, however, thwarts the growth of other plants that would otherwise shade out oaks.

Landowners can limit animal damage to oak seedlings by managing vegetation canopy so that it is low to the ground during winter. The goal is to reduce the cover that protects rabbits from predators. This can be achieved with low-growing grasses, such as redtop, or by mowing natural vegetation around oak seedlings in the fall. Although trees planted near field edges will be vulnerable to rabbits, those in the interior portion of large fields are less likely to be damaged.



Reduce cover near field edges to protect young oaks from rabbits. Plant with cover in open fields to protect them from deer.

Young oak trees in open fields still may be targeted by deer. Growing oak seedlings with a little cover may reduce their exposure to browsing. You can protect them further with wire mesh seedling cages or by wrapping their stems with spiral plastic strips.

You can limit an oak's exposure to damage or competition by planting large, vigorous seedlings and providing them with optimal nutrition for rapid growth. Deer usually won't browse the terminal shoots of trees that are taller than 5 feet. Larger diameter trees also have thicker bark, which makes it harder for rabbits and other rodents to girdle or damage their cambium. In addition, vigorous seedlings have the best chance of recovering from injuries.

The taller the seedling, the more likely its crown will remain above growing season floodwaters. Planting trees on natural or man-made mounds and ridges increases the seedling relative height, decreasing their susceptibility to flooding. You can construct raised beds or soil mounds with a rice plow or other implements. These will also improve soil drainage, aeration and conditions for good root growth. Mounding is most beneficial when planting trees in poorly drained, clay-rich soils. Coarse, well-drained soils probably do not need to be mounded.

Oak from acorns

Landowners can also sow acorns to regenerate bottomland oaks. Acorns collected from local bottomland oak trees are best because they produce seedlings that are adapted to life in the floodplain. Burying them in the top several inches of soil keeps acorns from drying out, ensures a good environment for germination and reduces acorn loss to small mammals.

Seedlings that develop their roots in place may do as well or better than seedlings that have been transplanted from a nursery. However, acorns may be eaten or destroyed by a host of insects, diseases and animals. After germination, small seedlings are subject to intense competition from other plants, floods and animal browsing. During early shoot growth, oak seedlings use most of their energy to build a root system rather than grow tall. Regenerating oaks by seed usually requires sowing thousands of acorns per acre to get the desired number of mature trees.

State and private tree nurseries usually sell bare root seedlings. These are mechanically lifted from the soil after one or two years of growth, packed into bundles and shipped to planting sites. Bare root seedlings lose much of their root system and experience stress during this process.

Recovering from this shock and injury after planting requires time and energy, which puts them at a disadvantage with competing vegetation. Because the survival rate of bare root seedlings is lower, landowners should plant extra trees to obtain the desired number of oaks. Again, the larger the seedling, the better its chances of survival.

Large, container-grown hardwood seedlings recently have become available in Missouri. These seedlings are grown in 3- and 5-gallon plastic pots in a way that creates a dense, fibrous root system. Trees may be 5 feet tall or more after one to two years growth in the nursery. Container-grown trees experience less stress after planting than bare root seedlings because their root systems remain intact and are ready to expand into the soil when conditions are right.

Another advantage of large container stock is that some trees produce acorns at a very early age. In some plantings, 2-year-old swamp white oaks and 5-year-old pin oak seedlings have produced acorns. This food production helps turkey, deer, ducks, songbirds and mammals. Although the initial cost of planting large container stock is higher than planting bare root seedlings or directly seeding acorns, their survival and growth rates are higher.

Your schedule, budget and equipment will dictate your strategy for regenerating bottomland oaks. Whether you sow acorns or plant seedlings, you can improve survival rates by reducing competition from other plants and damage by animals.

Your efforts will be rewarded in a more diverse, native bottomland forest that offers better habitat for wildlife and improved timber production. ▲



Large container-grown seedlings are better able to compete with other vegetation, tolerate deer browsing, and survive floods. Your efforts to establish trees go a long way toward helping restore bottomland forests.





Program Schedule

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- Cape Girardeau** UPN "The Beat" WQTV / Saturdays 8:30 a.m.
- Columbia** KOMU (Ch 8 NBC) / Sundays 11:00 a.m.
- Hannibal** KHQA (Ch 7 CBS) / Weekends, check local listing for times
- Kansas City** KCPT (Ch 19 PBS) / Sundays 7:00 a.m.
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- Warrensburg** KMOS (Ch 6 PBS) / Sundays 6:30 p.m.

Cable Stations

- Branson** Vacation Channel / Fri., Sat. 8:00 p.m.
- Brentwood** Brentwood City TV / Daily, check local listing for times
- Cape Girardeau** Charter Cable Ed. Ch. 23 / Thursdays 6:00 p.m.
- Chillicothe** Time Warner Cable Channel 6 / Wednesdays 7:00 p.m.
- Hillsboro** JCTV / Mondays 12 p.m. & 6 p.m.
- Independence** City 7 / Thurs. 2 p.m., Sat. 10 a.m. & Sundays 8 p.m.
- Joplin** KGCS / Sundays 6 p.m.
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- O'Fallon** City of O'Fallon Cable / Wednesdays 6:30 p.m.
- Parkville** City of Parkville / First and third Tuesdays of the month 6:30 p.m.
- Perryville** PVTV / Mondays 6 p.m.
- Raymore** Govt. Access-Channel 7 / Various, check local listings for times
- Raytown** City of Raytown Cable / Wed. 10:00 a.m. & Saturdays 8:00 p.m.
- St. Charles** City of St. Charles-Ch 20 / Tues. 5:00 p.m. and Wed. 10:00 a.m.
- St. Louis** Charter Communications / Saturdays 10:30 a.m.
- St. Louis** City TV 10 / Mondays 11:30 a.m., Wednesdays 3:30 p.m.
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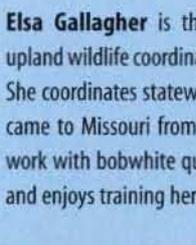


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Photograph by Jim Rathert

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