

# Stewardship Notes

Indiana Division of Forestry



## Underplanting Oak

When a harvest is being planned for a woodland, planning should consider what seedlings will replace the harvested trees. Almost all trees in a woods have become established by natural seeding. Sometimes, however, this natural system does not generate the desired species. This may be due to poor seed crops or heavy competition from less desirable species.

Oak is one of the most desirable species growing in Indiana. Although common, it does not readily reestablish itself in recently harvested woodlands. It can be planted to increase its numbers in future stands. One method is to plant oak before a woods is harvested. Tree seedlings are usually planted in full sunlight; however, trees partially tolerant of shade, such as oak, can grow well for a few years in the partial shade of an overstory.

Before planting oak seedlings in the shade of other trees, four criteria must be met:

- Existing number of tree seedlings should be determined as inadequate to restock the area;
- The area of planting must be at least one acre in size;
- The trees in the overstory, on that acre, must all be ready to harvest;
- The harvest must be planned to take place 3 years after the oak seedlings are planted.

Sequence of Events:

1. Plant oak seedlings on the forested area.
2. Kill all trees that will not be harvested. These will be mostly trees in the understory.
3. Allow the planted seedlings to grow for three growing seasons.
4. Harvest the overstory trees after the third growing season.

About 1/3 to 1/2 of the seedlings planted can be expected to survive 5 years after planting. After these trees have grown to full size, 50-100 of them will fit on an acre. If your goal is for oak to make up half of the trees in your woods, then 100 planted seedlings per acre may achieve this result.

Be sure the species of oak you are planting will survive and grow well on the site. Black oak and white oak are well adapted for dry hilltops or south and west facing slopes; swamp white oak, swamp chestnut oak, bur oak, cherrybark oak and shumard oak are adapted for wetter sites. Most sites are between these extremes and may grow any of these species. Request the services of a district forester to help determine the needs of your site. The larger the seedling being planted, the better its chance for survival.

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The existing understory should be deadened to allow more light to the seedlings. These understory trees can be cut or girdled with a chainsaw and the stump or girdle sprayed with herbicide. Also cut and treat all grapevines. This step comes before the tree planting, especially if the work is done the winter before the tree planting. Some managers choose to mist spray the understory with a herbicide such as Roundup\* the summer before the planting. If the area is misted, any desirable seedlings can be cut at ground level so they will not be affected by the herbicide. These will resprout the next summer.

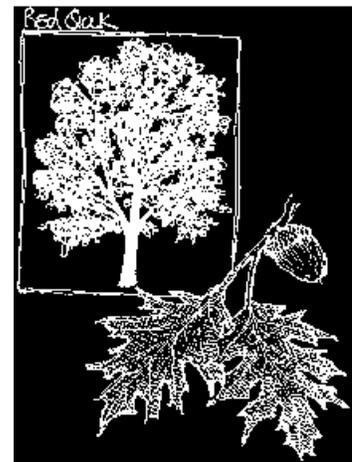
The planted tree seedlings should be allowed to grow in the shade of the overstory for three summers. The overstory shade suppresses other growth, while the semi-shade tolerant oak will survive and grow.

Schedule the overstory harvest in the fall or winter after three growing seasons. Any seedlings broken off by harvest equipment will resprout and quickly regain their height.

Once the overstory is harvested, make sure there are no large trees remaining to shade out the seedlings. These seedlings can now be left to grow. Other species from natural seed will also develop, but the oak will be a little ahead.

The overstory must be removed 3-5 years after the oak is planted, or the seedlings will die from lack of sunlight. If there is less than normal rainfall during the first growing season, mortality may be very high as a result of intense moisture competition from the overstory.

Inspect the planting at least 10-15 years after the final harvest to determine if the planted seedlings need release from more rapidly growing species.



Three years to releasing seedlings is the minimum time needed. However, if a thinning is done prior to planting, and the crown density is reduced to 50%, then seedlings can theoretically be left to develop for up to 10 years before a full removal of the overstory trees is needed. In this case, a shelterwood harvest that removes 40% to 50% of the crown cover is held prior to planting the seedlings. Step 3 on the reverse side is amended to give more flexibility (3 to 10 years). A professional forester can help determine when the planted seedlings have developed enough to be able to compete with new regeneration stimulated by canopy removal (removing the remainder of the overstory trees).

*\*Mention of a specific product or brand name is not meant to be an endorsement of that product by the Division of Forestry or the state of Indiana, but is for identification purposes only.*