

FORESTRY 101



Planting Trees

by Laurie Taylor Thomas

A tree planting can range from a small planting of a couple of trees in your landscape to a large afforestation effort to establish tree cover on a non-forested area such as an old fescue field or former crop land. This article focuses on many of the components of planting trees in open areas such as former agricultural fields. It's important to determine your planting objective because it will often dictate the tree species and quantity of seedlings you will need. Two organizations that can be helpful in your tree-planting project and should be contacted prior to planning and planting are the Kentucky Division of Forestry (KDF) and USDA Natural Resource Conservation Service (NRCS). Both organizations can provide technical assistance with tree-planting projects, and NRCS may also be able to provide financial assistance for your project. With some careful and well thought out planning your tree planting can be successful.

Evaluating the Planting Site

The first step is to evaluate the planting site. This is important to help you match the right tree to the right site. Start this process about a year before planting since there are several factors you will need to know about your site. These factors include:

- Soil information such as type (drainage, fertility, and texture), pH, and moisture
- Amount of available sunlight
- Existing plant competition
- Site exposure (aspect or orientation if on a slope; north and east facing slopes generally have better growing conditions)
- Overhead or underground utility lines
- Nearby buildings, driveways, or sidewalks

Primary factors limiting tree planting success:

- Soil drainage: excessively drained or poorly drained
- Existing competing vegetation (grasses, weeds, and invasive plants)
- Exposure/aspect: wind, sun, and shade
- Wildlife: deer, voles, and other small mammals

For soil type information, visit your local conservation district and consult the U.S. Department of Agriculture's soil survey maps or visit the Natural Resources Conservation Service's Web Soil Survey (<https://websoilsurvey.sc.egov.usda.gov/App/HomePage.htm>). To determine soil fertility and pH analysis submit a soil sample to your local cooperative extension office, check with them for the proper steps to follow when collecting the soil sample.

Selecting Tree Species

After determining your objectives for planting and evaluating your site, carefully consider the tree species you plant. The goal is to plant the right tree in the right place; select species with requirements that are similar to your site's conditions. It is best to choose trees native to the area. Only consider species that have no major pest or pathogen problems. Choose a variety of tree species so your overall planting will be less impacted if pest or pathogens issues arise. If you need assistance with selecting species for your planting site, consult with KDF, USDA NRCS, a local arborist, or your local cooperative extension office. You can also refer to KDF's Seedlings fact sheets (<https://eec.ky.gov/Natural-Resources/Forestry/state-nuseries-and-tree-seedlings/Pages/Seedling-Descriptions-and-Fact-Sheets.aspx>).



The Kentucky Division of Forestry can assist you in selecting appropriate trees for your tree planting project.

Tree Spacing and Arrangement

For a larger afforestation planting of deciduous trees for timber production, a closer spacing is desired to promote straight trunks and self-pruning branches. Knowing tree spacing and arrangement will help determine the number of tree seedlings to purchase. Site conditions will probably vary throughout the site, make sure to match the right species with those conditions. For example, if a portion of the site has wetter soils or is near a water source, you would want to plant a tree that is

tolerant of wetter soils. KDF can be of assistance with tree spacing and arrangement. Typical spacing for deciduous trees is either 8' x 8' or 9' x 9'. With 8' x 8' spacing you will need 681 trees per acre, with the 9' x 9' spacing you will need 538 trees per acre.

Landscape Plantings:

For landscape plantings, follow the U.S. Forest Service Guidelines for planting near sidewalks, driveways, buildings, and overhead utility lines.

- Trees should be placed at least 25 feet from overhead wires if a tree will grow larger than 30 feet.
- Trees should be placed at least 3 feet from pavement or fencing on all sides, 15 feet from buildings and other yard trees.

For landscape plantings you may choose to plant a containerized seedling or a "balled and burlapped" (B & B) tree that has a developed root ball with soil. B & B trees are more difficult to handle and to plant plus more expensive than containerized trees. Containerized and B & B trees can be purchased from a local nursery. To find a nursery in Kentucky, check-out PlantNative http://www.plantnative.org/nd_kytomt.htm. Be sure to keep tree roots moist until planting.

Ordering Trees and Tree Seedlings

The next step in your planting process is to order your plant material. For larger-scale tree plantings, you will likely choose bare-root tree seedlings. Bare-root seedlings generally come in bundles of 25 up to 100 seedlings. For bare-root seedlings, the KDF has two tree nurseries (<https://eec.ky.gov/Natural-Resources/Forestry/state-nurseries-and-tree-seedlings/Pages/default.aspx>) that provide dozens of



Tree seedlings may be purchased through one of the KDF state tree nurseries such as the Morgan County Tree Nursery (left) or the John P. Rhody Nursery in Marshall County. Seedlings are packaged and shipped in bundles of up to 100.



Photos pages 6-7 courtesy: Kentucky Division of Forestry

species in several bundle sizes. KDF Nurseries begin taking orders in September for the following spring plantings. The seedlings will be shipped to you from January to April. Seedlings should be kept cool and moist until planting so try to plant soon after receiving them.

When to Plant

The best time to plant is while the tree and bare-root seedling is dormant (buds have not opened) and the soil is workable; which in Kentucky means planting in the fall (late October through early December) or early spring (February through early April). Fall planting can allow roots to become better established over winter, however, if the winter is particularly cold and without snow cover, newly planted trees can be pushed out of the ground by frost-heave. For landscape plantings, place wood chips or mulch around the base of the tree to help reduce the possibility of frost-heave. Bare-root seedlings are typically planted in the early spring while they are still dormant.

Preparing the Site

Most afforestation efforts occur on former pastures or cropland, so these sites will need to be prepared for planting. The most ideal site would have had crops less than a year ago so they will be relatively free of weeds and woody stems. Tree seedlings could be planted right away once crops are removed. However, if there are weeds, woody shrubs or trees they will need to be removed and controlled prior to planting; this may require the use of herbicides. Work with your forester to come up with the best plan of removal and control. Also, remember if using herbicides to review the herbicide label that provides information on when to use and how to be safe during application and disposal.

Mechanical and Hand Tree Planting

For afforestation projects where the landscape is not too steep and the site is accessible, the quickest and easiest method for planting seedlings of 1,000 or more is using a tree setter attached to a tractor. Contact KDF for information on how to borrow and use this machinery. However, if your site is too steep, you are planting less than 1,000 seedlings, or the expense of renting machinery is too great, your option is to plant the seedlings by hand. To plant by hand you will need a dibble bar, grub hoe, planting bar, or any other flat-bladed tool. The blade size needs to be large enough to make a proper size hole for the roots of your tree seedlings (see infographic on page 8). Once the seedlings are planted, you may need to consider protection from wind, wildlife damage, and



For larger plantings where the land is not too steep, tree setting machines can be borrowed from KDF.



Rigid seedling protector.

mowers. Depending on your site and budget, seedling protector tubes may be an option. Seedling protectors can be expensive, therefore cost prohibitive, on a large planting, but for smaller plantings they can be beneficial to the survival of the seedlings. Periodically check the seedling protectors and replace as necessary. Also remember you will have to control competition from weeds, and this may require the use of herbicides or mulch, depending on the plan you have developed with your forester. For more information on tree protection see Kentucky Woodlands Magazine Volume 6 Issue 2, Forestry 101 by Dr. Jeff Stringer.

This article highlighted a few of the important steps of proper preparation and planting of trees and tree seedlings, but it is highly recommended that you contact a professional forester or local cooperative extension office for advice and assistance with your tree-planting project.

Resources:

Kentucky Division of Forestry Tree seedling planting instructions: <https://eec.ky.gov/Natural-Resources/Forestry/Documents/seedlingplantinginstructions.pdf>

Kentucky Division of Forestry Forest Stewardship Program and Landowner Services: <https://eec.ky.gov/Natural-Resources/Forestry/forest-stewardship-program-and-landowner-services/Pages/default.aspx>

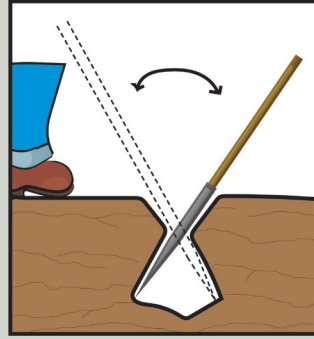
Cost-share options for Kentucky forest land owners: <https://eec.ky.gov/Natural-Resources/Forestry/forest-stewardship-program-and-landowner-services/Pages/Cost-Share-Options-for-Forest-Landowners.aspx>

Forestry Suppliers equipment (tree planting bar and tree seedling protection tubes): www.forestry-suppliers.com/

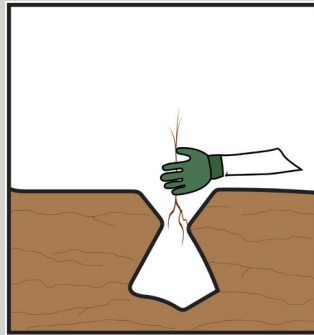
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- Reeves, C. Planting Tree Seedlings. University of Kentucky College of Agricultural, Food and the Environment Cooperative Extension Service FORFS 17-09.
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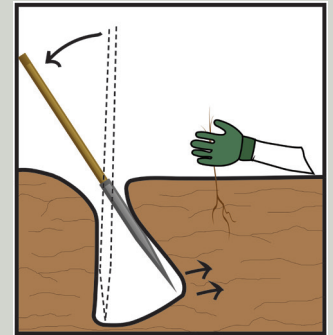
Hand Planting Tree Seedlings



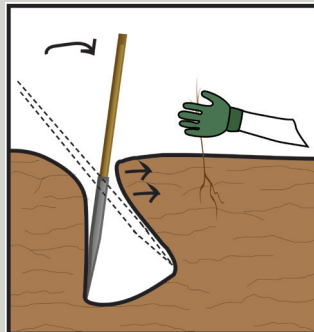
(1) Insert the dibble bar or other tool straight into the ground, pull backward on the handle and push forward to make a small hole.



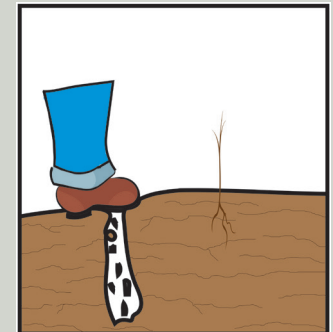
(2) Remove the dibble bar and push the seedling into the hole. Shake the roots free and pull the seedling back up to where the root collar is at ground line.



(3) Move six inches back and insert the tool straight into the ground again and pull the bar handle toward yourself firming up the soil at the bottom of the roots.



(4) Push the handle away to firm up the soil at the top of the roots.



(5) When the hole of the seedling is closed, fill in the last hole by tamping it with your heel.

About the Author:

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