

Planting Trees

TREES

A wise old owl once asked of me
Do you know how useful you can be?
I thought for a while and then replied
Here are some uses that I provide.
A home for birds, food for man
Shade and protection for the land
I help to hold the soil together
And help provide man with water.
The owl shook his head wisely and said
That's true! Then why do men chop at
you?
Ah, I sighed, because you see
I am different — I am a tree.

Joy Anne Howell—age 9



Kentucky 4-H Forestry Project

Deborah Hill, Department of Forestry

So you are interested in planting trees! Well, you've come to the right place. In this 4-H tree-planting project you can learn:

- the kinds of trees to plant in Kentucky,
- the types of soils various trees prefer,
- when to plant trees,
- how to plant trees,
- how to care for planted trees.

You may also:

- complete additional interesting activities,
- serve as a resource person or leader for a younger 4-H group,
- do a demonstration or give a talk about tree planting,
- complete a project record,
- participate in forestry field days and environmental youth camps.

Before you start!

We recommend that 4-H'ers complete 4DD-01PO, *Exploring Natural Resources*, before starting the forestry projects. The project is an interesting study of the different parts of the ecosystem: earth, air, water, plants, and animals. Understanding the ecosystem provides a basis for the study of forestry or any other natural resource.

The first forestry project is a forest tree identification project to help 4-H'ers become familiar with the trees in Kentucky. Members in the sixth grade and up will have fun completing this project. From this basic forestry project, 4-H'ers can go on to take other interesting forestry projects.

Kentucky 4-H offers several forestry projects and interesting related forestry activities such as environmental youth camps and forestry field days for juniors and seniors. These are wonderful activities to round out your forestry project.

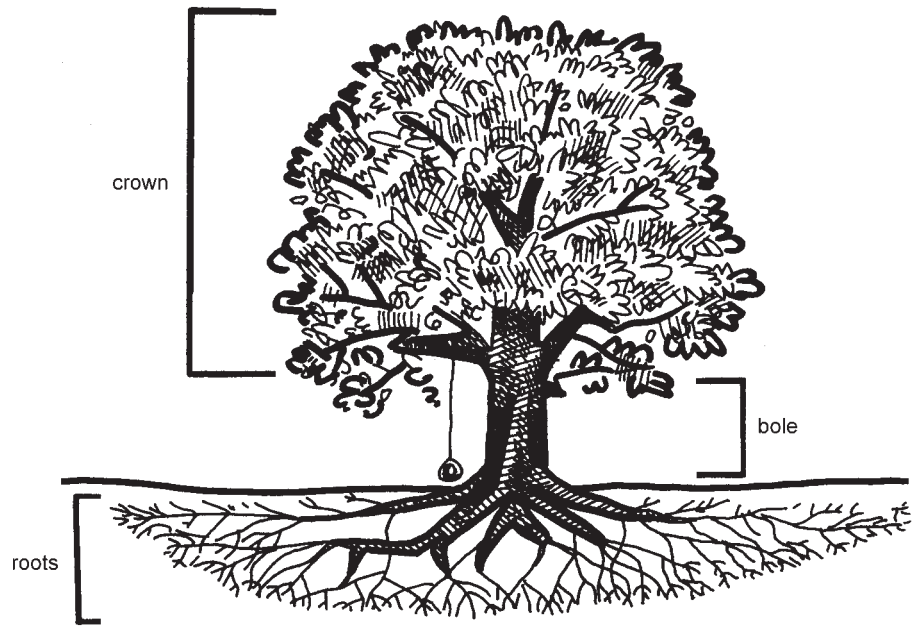
What's a tree to me?

What's a tree to you—or to me? Well, have you ever thought of what your life would be like if there were no trees? Look around you—at home, school, work, or play. What things are made from wood? What products come from trees? Just how important are trees to you?

Activity

Make a list of what whole trees do for you. Then make lists of what the crown (top of tree with leaves) does for you, what the bole (trunk) does for you, and what the roots do for you. Now, see if your lists include all of the following benefits of trees.

1. Probably the most important product of trees is the *oxygen* they put into the air during the food-making process of *photosynthesis*. Trees (and other plants) remove carbon dioxide (CO_2) from the air and release oxygen (O_2) back into the air. Since animals (including people) need oxygen in order to survive and also release carbon dioxide as a waste product, plants and animals together create a balance.
2. The second most important value of trees is their influence on quantity and quality of *fresh water*. Wherever trees are present, they give off water vapor into the air and provide moisture. This contributes to *precipitation* in its various forms (rain, sleet, snow, hail). The roots of the trees penetrate the soil, making channels and openings that improve drainage through the soil. This natural drainage system allows water to go through the soil rather than running over the soil surface, causing erosion.



3. The third most important value of trees is that they *protect the soil* by holding it with their roots and dropping layers of leaves or needles on its surface to prevent erosion. This *organic matter* that the trees drop on the soil surface becomes part of the soil through the actions of small animals, fungi, and bacteria. The soil becomes deeper and forms nutrients that plants can then reuse to grow.

All other uses of trees—wood products, food, wildlife habitat, climate control and aesthetics—are all secondary to these three major uses. The secondary uses often have clearer price tags on them, however. It is harder to value clean air, clean water, and rich soil in terms of dollars and cents.

Why do we plant trees?

What do we plant when we plant the tree?
 We plant the ship which will cross the seas,
 We plant the mast to carry the sails:
 We plant the planks to withstand the gales—
 The keel, keelson, and beam and knee—
 We plant the ship when we plant the tree.

What do we plant when we plant the tree?
 We plant the house for you and me:
 We plant the rafters, the shingles, the floors;
 We plant the studding, the lath, the doors,
 The beams, and siding, all parts that be;
 We plant the house when we plant the tree.

What do we plant when we plant the tree?
 A thousand things that we daily see;
 We plant the spire that out-towers the crag,
 Plant the staff for our country's flag,
 We plant the shade from the hot sun free;
 We plant all these when we plant the tree.

—Henry Abbey

Trees are living organisms and usually live for many years longer than people do. It is important therefore to plant trees for special purposes, not just to put seedlings in the ground somewhere.

We can grow trees on land that is not fertile enough to grow other valuable crops. We can plant trees for all kinds of reasons: to beautify a public building, to provide food and homes for wildlife, to build a windbreak or shelterbelt to protect our homes from too much wind in the winter time, or to sell at Christmas time for extra pocket money.

We can also grow trees for pulpwood or timber, but that takes many years.

- Christmas trees can be produced in 6 to 10 years.
- Fence posts can be produced in 15 to 20 years.
- Pulpwood can be produced in 20 to 35 years.
- Sawlogs and timber can be produced in 40 to 60 years.

What kinds of trees do we plant?

It is always wise to plant trees that grow naturally in the area. In Kentucky, our natural forest has oaks, hickories, maples, ashes, elms, cedars, pines, and lots of other kinds of trees. Kentucky's forests are some of the most *diverse* forests in the world—which gives us lots of tree species to choose from.

It is also wise to plant trees on appropriate sites. Some trees like to get their “feet” wet; others prefer to be high and dry. Plant trees in places where they belong.

For example, flowering dogwood trees grow in the forest, usually under some shade of larger trees. But people buy dogwood trees for their front yards, put them out in full sunlight all day, and then wonder why the trees get sick or die.

Study the chart below. It tells you the kinds of soils preferred by particular tree species. Ask your county Extension agent to help you identify your own soils.

More detailed information about correct species/site locations is available from a publication called *The Kentucky Tree Planting Manual*. It was written by the Kentucky Division of Forestry and is available through your Extension 4-H or agricultural agent.

Seedlings of many species of native trees can be purchased for a small fee from regional offices of the Kentucky Division of Forestry. They are also available from local tree nurseries.

Trees for Soil Types

Dry, sandy or gravelly	Sandy or gravelly loams	Moist loam or clay loams	Well-drained heavy clay	Wet loam or clay
Scotch pine	White pine	White pine	Black gum*	Cottonwood*
Shortleaf pine	Scotch pine	Norway spruce	White ash*	Red oak*
Virginia pine	Shortleaf pine	Scotch pine	Red oak*	White ash*
Redcedar	Black locust*	Hemlock	Basswood*	Swamp white oak*
		Red oak*	Black walnut*	Blue ash*
		White oak*	Sassafras*	Green ash*
		Black walnut*	River birch*	Bald cypress**
		White ash*	Sycamore*	
		Catalpa*	Sourwood*	
			Pin oak*	
			Red maple*	
			Hickories*	

*deciduous hardwoods (trees that lose their leaves)

**deciduous conifer

All other unmarked trees are evergreen conifers.

When do we plant trees?

In Kentucky, there are two planting seasons, spring and fall. Conifers (cone-bearing or evergreen trees) are usually planted in the spring (March or April), but both *conifers* and *broadleaved* trees can also be planted in the fall (November or December).

Fall planting sometimes allows the tree's roots to become better established over the winter and be healthy for the spring budbreak the following year. However, sometimes when we get really cold weather without a protective snow cover, newly planted seedlings can be pushed right out of the ground by frost. This is called "frostheaving." Placing 2 or 3 inches of wood chips, sawdust, or other organic material around the base of the tree (mulching) helps reduce the possibility of frost-heaving.

Trees are more likely to survive if they are transplanted when they are inactive, or *dormant*. This helps minimize what is called "transplant shock." If the tree is trying to grow new roots and new leaves and to carry on photosynthesis when it is moved from place to place, there is often too much *stress*, and the tree may *wilt*, or even die. If you plant when the tree is inactive, it has a much better chance of putting its energy into readjusting to the new site before it has to grow new roots and leaves.

How do we plant trees?

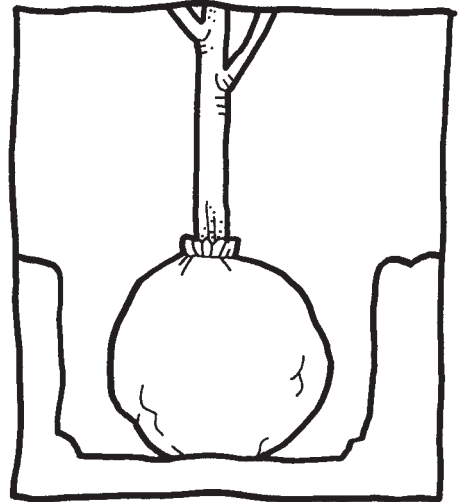
The rules are slightly different for good-sized trees and for seedlings. Trees that come with a ball of soil attached to them are called "balled and burlapped" stock (B & B). These trees are several years old, often several feet tall and the *bole* may be an inch or so in diameter.

It *may* be necessary to stake newly planted trees. There are two ways to stake a tree:

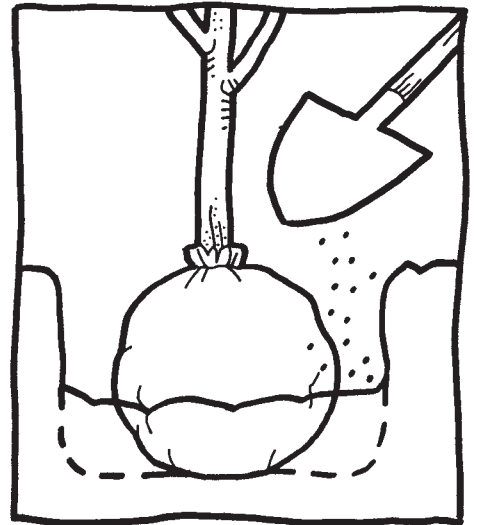
1. Use short (1- to 2-foot) stakes and guy wires. Cover wires around the tree with old rubber hose or some other material that will prevent the wire from cutting into the tree bark, OR
2. Use a single long (4- to 6-foot) stake bound directly to the tree. Place all stakes in the ground outside the planting hole and deep enough in the ground to provide support for the trees.

Mark small stakes with paint of a bright color, or flag the stakes so people will not trip over them. If you do stake the tree, remember to remove the stakes and wires the following year. Check the tree every now and then during the first year to see that guy wires are not cutting the tree.

Planting balled & burlapped trees



1. Place tree with ball in a hole at least 2 times as wide (but same depth) as the ball.

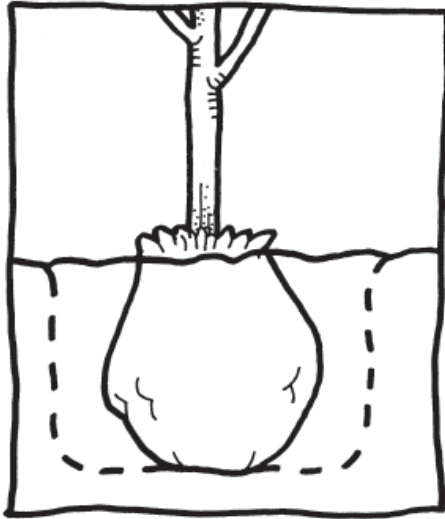


2. Fill loose soil from the hole around edges of ball and pack tightly. DO NOT USE peat moss, potting soil, leaf mold, pine bark, sand, etc.

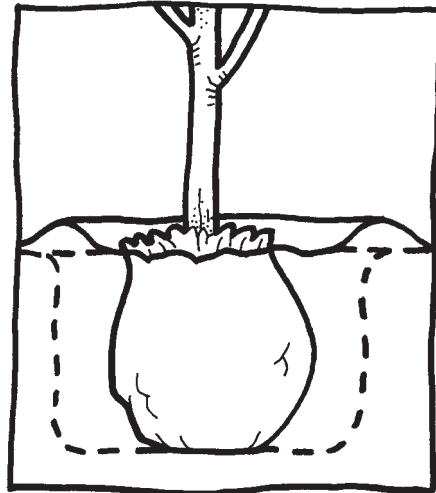
Caring for balled & burlapped trees

Trees require care for several years after they are planted.

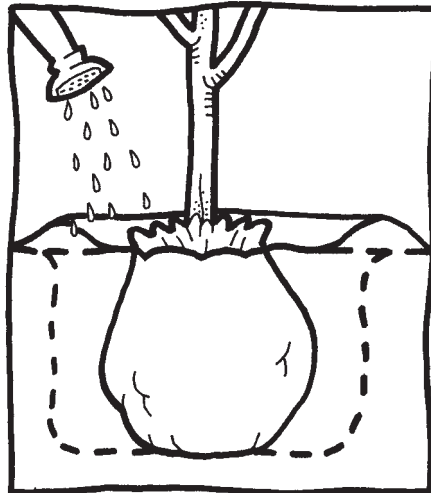
WATER the equivalent of 1" of rain per week during the growing season (May-October). Soak thoroughly once a week; leave water running from the hose at a slow rate at the *drip line* (outermost edge of the leaf crown) about an hour.



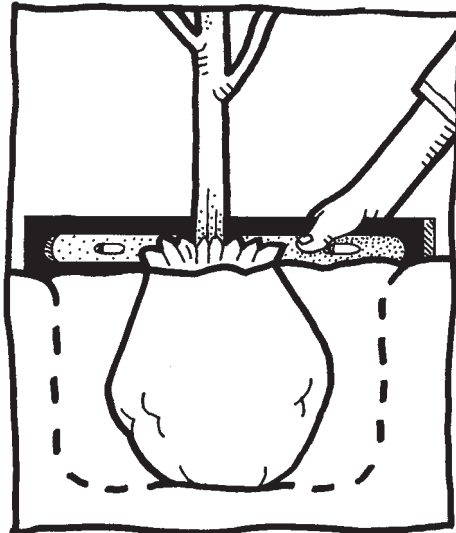
3. Rip loose the top of burlap bag around the stem. (If the bag is plastic or some color other than natural brown, remove it **completely**. Also remove all plastic twine.) **DO NOT** plant trees in fiber pots.



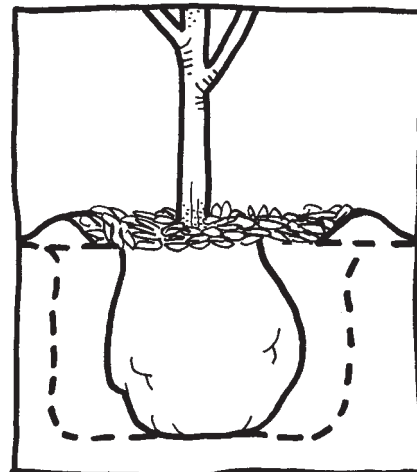
5. Form basin of soil with raised rim around edge of hole to catch water.



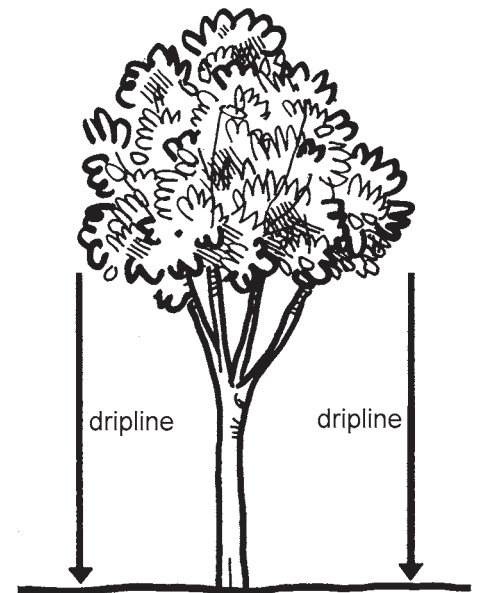
6. Water thoroughly.



4. Check with a level to see that the root collar (change in color on tree or stem) or surface level of root ball is at soil line.



7. Cover soil surface with 1 to 2 inches of mulch (bark, sawdust, woodchips, straw—something organic).



FERTILIZER is *not* recommended for the first year. You can use a complete fertilizer (10-10-10) or ammonium nitrate when trees are *dormant* (November-January). Sprinkle fertilizer on the soil surface in a band from about 2 feet outside to 2 feet inside the drip line. Less is more; you can kill trees with too much fertilizer.

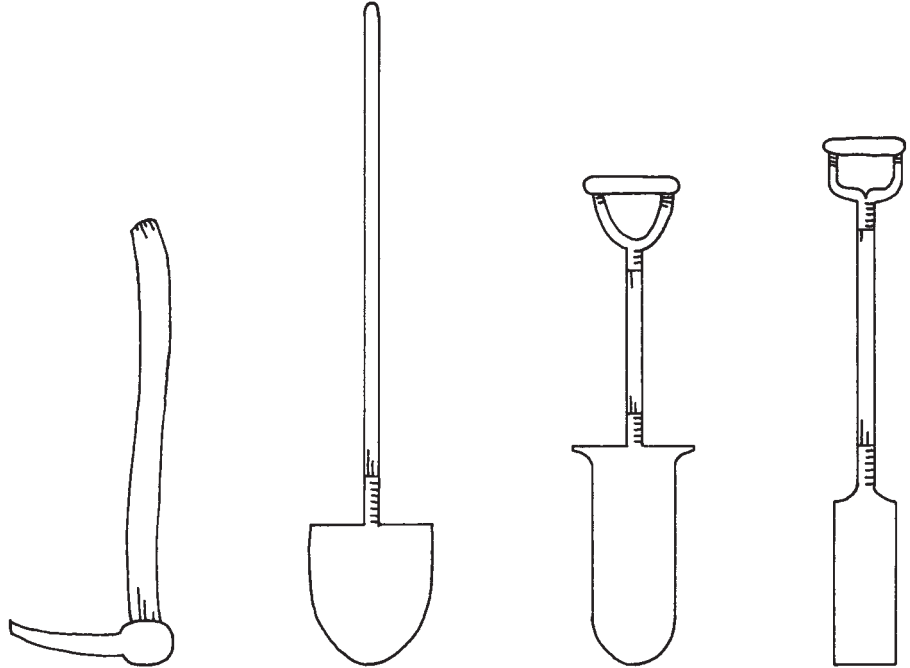
PROTECT the base of trees from dogs or other animals, lawn mowers, etc. with fencing or other physical barriers.

Planting seedlings

Seedlings are a little easier to work with. Most come in large bundles of 100 or more seedlings per bundle. Keep the roots damp at all times. Unwrap the bundles and sort the seedlings by size (small, medium, large). Then clip (*prune*) the roots a little so they will fit in the small holes you will open for them.

Do not plant tree seedlings closer than 6 feet apart. Seedlings of broadleaved trees should probably be at least 8 to 10 feet apart. Decide where you want to plant your seedlings and mark those spots with some kind of marker—sticks, flags, etc.

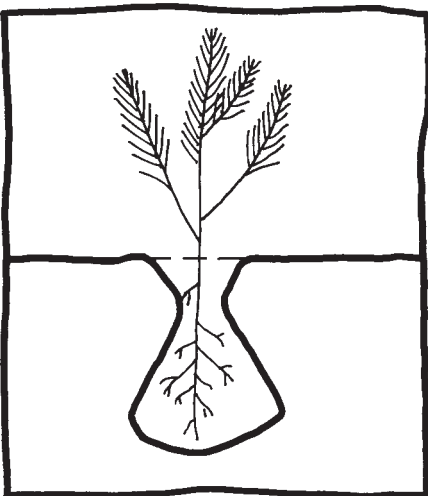
There are different tools you can use to plant trees of any size. The planting bar and tiling spade are most often used with seedlings. Pay close attention to the correct planting depth.



The grub hoe or mattock, round-pointed shove, tiling spade, and planting bar (left to right) are the tools most commonly used for planting trees.

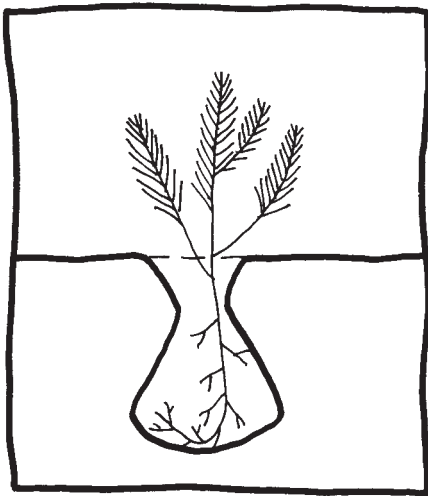
Plant depths

Correct



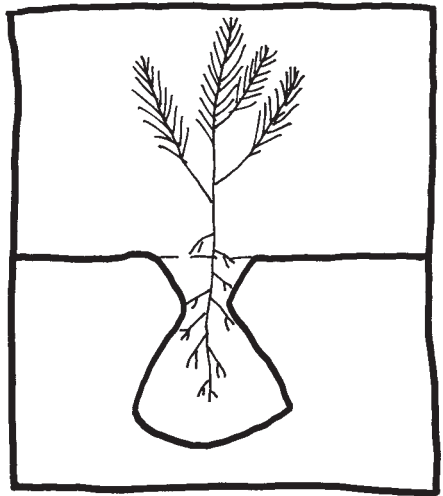
Seedlings with root collar at ground level. Roots spread out in the hole.

Incorrect



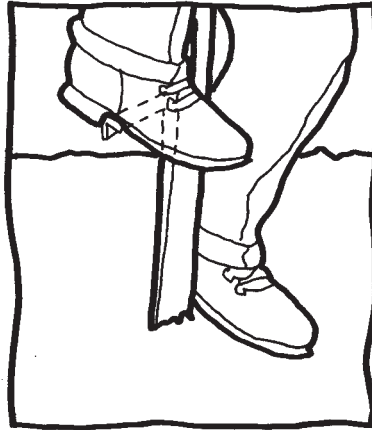
Root collar too low. Cramped roots may develop into a poor root system.

Incorrect

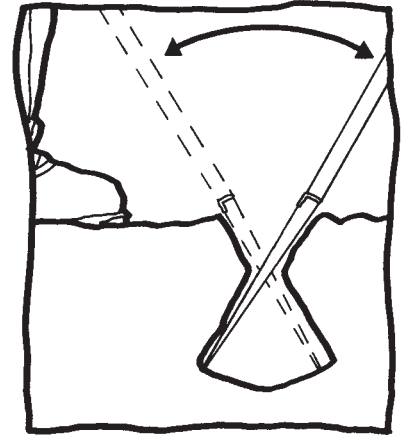


Root collar too high. Survival chance is poor; roots may dry out.

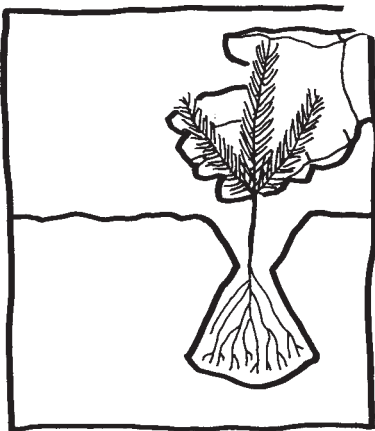
Follow the steps below for planting seedlings.



1. Insert dibble-bar straight down, as shown.



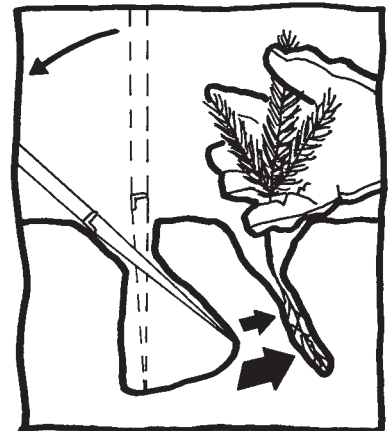
2. Pull backward and push forward to open hole.



3. Remove dibble-bar. Push seedling deep into hole and shake roots free. Pull seedling back up to where root collar is at ground line.



4. Move dibble back 6" from first hole and insert again.



5. Pull handle of dibble toward yourself, firming soil at bottom of roots.



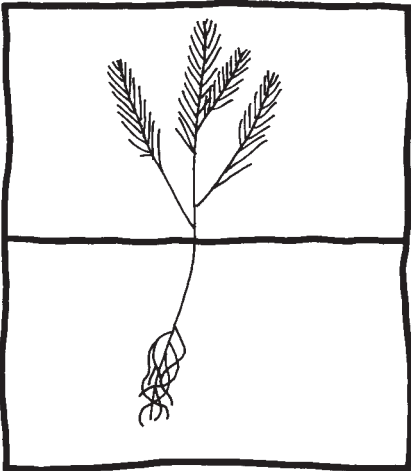
6. Push handle of dibble away from yourself, firming soil at top of roots.



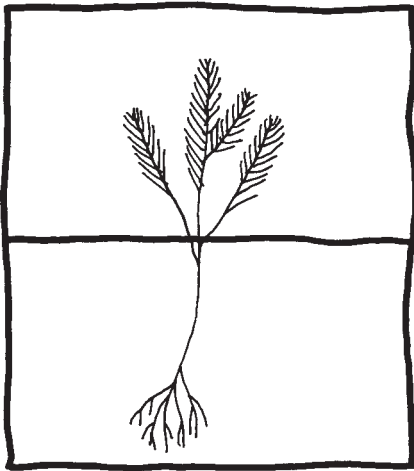
7. When original hole is closed, fill in last hole by firming in with your heel.

Here are some additional problems to look for when planting seedlings.

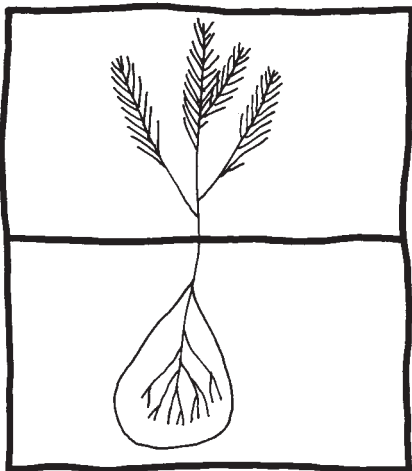
Planting Errors



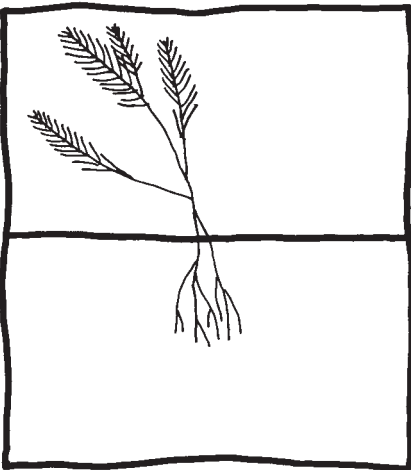
tangled roots



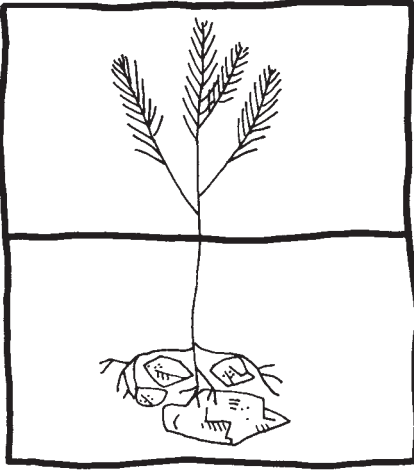
too deep



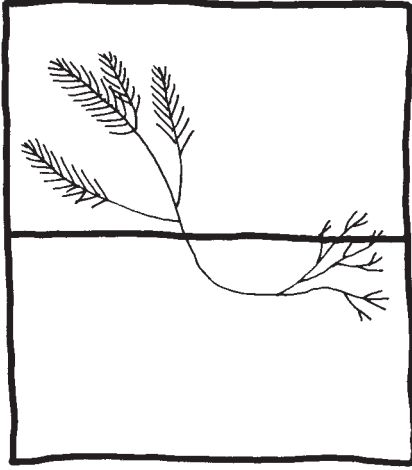
air pocket



too shallow



rocky sites



turned-up roots

Caring for seedlings after planting

Seedlings will need watering, especially if there hasn't been recent rain, and they *may* benefit from a slow-release fertilizer. Be very careful using fertilizer because too much can easily kill tree seedlings.

Watch both trees and seedlings in their first few years of growth for any signs of insect or disease problems. The earlier you catch problems, the easier it is to correct them.

More interesting planting activities!

There is no end to the interesting activities you can do to make your tree-planting project more interesting. Try some of these:

1. For a long-term activity, grow your own seeds! Collect acorns or other tree seeds when they are falling from the trees. Some seeds need to go through a cold period before they can grow, so keep seeds in the refrigerator for a month or two. Then plant them in regular potting soil, about 1" beneath the soil surface, in a separate container for each seed. (Use clay pots, fiber pots, milk cartons, etc.) Keep seedlings warm—approximately 70 degrees Fahrenheit—and damp, but not wet.
When seedlings grow big enough to have two sets of leaves, plant them outside in the spring (March or April) or fall (November or December).
2. Find out the kinds of insects and diseases associated with the trees in your area. Learn how to control these problems. Then make a display showing the diseases and the control measures.
3. Investigate why trees grow in different locations, how trees are planted by nature, and which trees are best for different purposes; for example, timber, windbreaks, aesthetics. Make a display illustrating a few of these trees and show why they are good for the purpose shown.
4. Make a collection of photographs of tree characteristics, leaves, buds, bark, and their winter form.
5. Visit a city forester, tree farmer, arborist, nursery operator, or state forester to learn about their jobs—how they are alike and how they differ.
6. Observe carefully the trees around your home. Observe them for disease or other problems. With the help of your leader, try to determine what can be done to correct the problems.

Citizenship & leadership activities

1. Select an area of your community which needs trees (park, nursing homes, school, etc.) In cooperation with local nurseries, arrange a tree planting project. Arbor Day (the first Friday in April in Kentucky) is a good time.
2. With your 4-H club, plan a spruce-up day for an area of your community. See that the area is cleared of litter. Examine trees on public property and see what needs to be done to make them healthy and attractive.
3. Arrange to visit local civic organizations to share some of the activities you completed in this tree-planting project. Encourage the group to help with needed community cleanup, etc.
4. Try to arrange a radio program and/or a newspaper article to inform the community of the activities your club has completed to improve the community. Use this opportunity to get their help with clean-up or tree planting, etc.
5. Serve as a resource person or a leader for a younger 4-H group. Share your tree-planting experiences with the group. Encourage the group to participate in the following Adopt-a-Tree experiment.

Adopt a tree

1. Pick a nearby tree to “adopt.”
2. On the first visit to the tree, write down the following observations:
 - Size of tree, leaf shape, bark color, and any other noticeable features,
 - Signs of life in the tree, whether it is asleep (*dormant*) or awake,
 - Whether it makes any sounds,
 - How the different parts of the tree smell: the bark, old leaves, new leaves; think how it might smell at different times of the year,
 - How the tree might have gotten where it is and how others might join it,
 - How other living things might need the tree for survival,
 - What things the tree needs for its own survival,
 - How long the tree might live.

WARNING: Do not eat any part of the tree.

3. Make visits at each season of the year and write down your observations:
 - How the tree has changed,
 - How the tree has remained the same,
 - What you expect the tree to look like the next time you visit.

Speeches & demonstrations

One of the best learning experiences in your 4-H project is to learn to give a speech or demonstration. Ask your agent or leader about opportunities to do this. Choose one of the following topics or another forestry topic of interest to you.

The Oldest Tree in Our Town
Trees—for Better Breathing
For Trees’ Sake

Please Don’t Plant Me Under the
Wires!

For That Special Touch. . . Plant
Trees

Kentucky 4-H Forestry Project Record

Planting trees

Name _____ Birth Date _____

Address _____
Street & Number/Rural Route City Zip

School _____ Grade _____ County _____

1. List new things you learned in this project or activity.

2. List the number and types of trees planted, where you obtained the trees, and the dates you planted them.

Type of Trees	How Many	Where Obtained	When planted
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____

3. List other learning experiences you completed as part of this project. List demonstrations, talks, exhibits, radio and television appearances, newspaper articles written, tours, workshops, camps, judging events, and field trips.

4. List awards, trips, medals, plaques, trophies, ribbons, scholarships, or other recognition you received as part of this project.

5. Attach a story in which you tell about things you learned, any problems you may have had, and how the project has helped you.

Member

Date

Leader

Date