Tree Planting Guide

Tree planting is an important part of our Kansas heritage. Since settlement days, Kansans have planted trees for timber, fuel wood, field borders, boundary lines, wind protection, and wildlife habitats. Today, as in the past, trees are a vital part of rural conservation programs.

Ordering Trees

Tree and shrub seedlings, both bare-root and container-grown, and stratified walnut and pecan seeds, can be purchased from the Kansas Forest Service.

Orders may be made over the phone, via email, or by mail. Order forms are available at local K-State Research and Extension, County Conservation District, Natural Resources Conservation Service, and Kansas Department of Wildlife, Parks and Tourism offices.

Trees and shrubs are sold on a first-come, first-served basis. Orders for spring delivery are accepted December through the first full week of May. Orders for fall delivery are accepted from early September to mid-October. Only selected species of container grown plants are available in the fall. Order early to ensure you receive the necessary plants.

Plan the planting before ordering, often up to one year ahead of time. Know where, when, and how the seedlings or seeds are to be planted and what care you will give them after planting. A well-planned planting has a greater chance of success than one that is poorly planned.

Planting Time

Bare-root trees and shrubs, container-grown evergreen trees, and stratified seeds are available for spring planting. In the fall, only container-grown evergreen tree seedlings are available.

Orders will be shipped in the spring between mid-March and the first week in May, and in the fall they are shipped throughout the ordering period.

Plants and seeds should be planted as soon as possible to encourage good survival and early growth.

Preparing the Site

Site preparation is one of the most important, but often most neglected, aspects of tree planting. Proper site preparation increases survival and growth of newly planted tree seedlings. Select any of the following methods, depending on the soils, ground cover, and method of planting to be used. The objective is to create a planting site with loose soil approximately 12 inches deep that is free of perennial vegetation, while providing good soil erosion control.

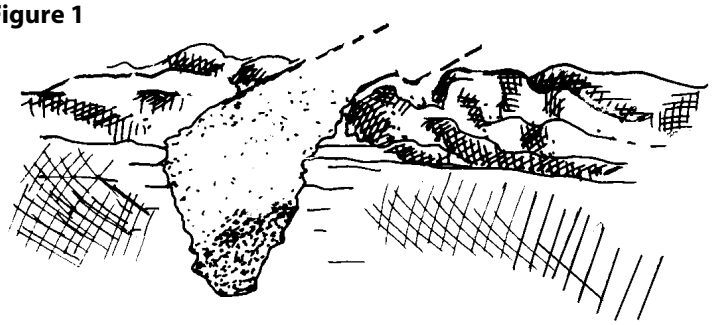
Summer Fallow—On sod sites, an approved contact herbicide treatment is often necessary; then fallow the entire planting site or strips where trees will be planted the summer before planting. Use a one-way disc or plow to turn the sod. A sub-surface tiller can be used on light soils where wind erosion is a problem.

Fall Plowing—When planting a cropland site, deep plow in the fall with a mold-board plow or chisel to break through the plow layer and loosen the soil. This allows for aeration and water penetration. Disc the site before planting in the spring.

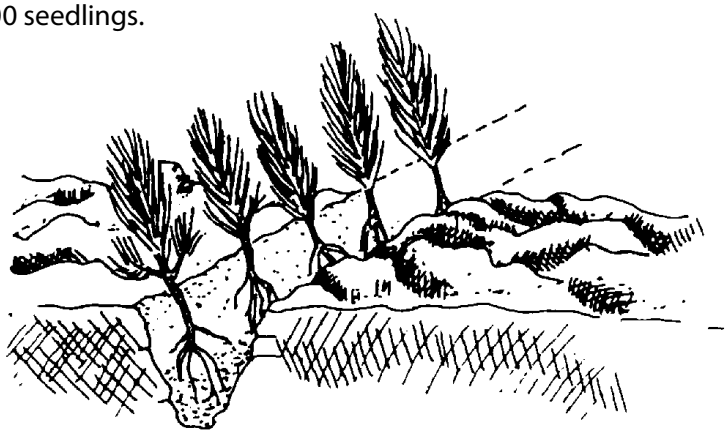
Scalping—If the planting site will not permit mechanical treatment, hand scalping will serve as a minimum treatment. Remove the sod from a minimum 4-foot-diameter circle at each planting site.

Spot Treatment—As an alternative to scalping on sites where mechanical cultivation is not practical, use a contact herbicide to kill competing vegetation. Spray a minimum 4-foot-diameter circle during the growing season before planting. Plant a seedling or seeds in the center of the treated area.

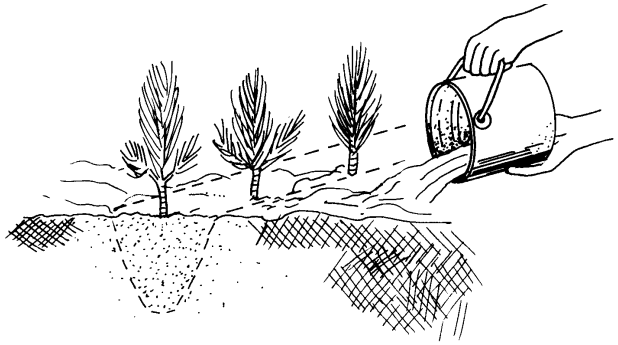
Figure 1



1. Dig a V-shaped trench deep enough and wide enough to hold the roots without crowding. A 10-foot trench will hold approximately 1,000 seedlings.



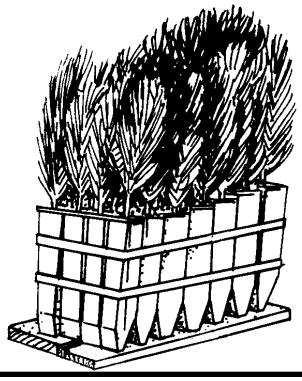
2. Cut cords on the bundles, string seedlings out, and place the roots in the bottom of the trench. Make sure the roots are spread out. Place the plastic name tag by the seedlings for future identification.



3. Replace the soil and water thoroughly. Watering allows the soil to settle around the roots, removing air pockets.
4. Water occasionally to keep the roots moist.

Figure 2

Keep the roots moist by watering periodically with a mixture of fertilizer and water. Mix one tablespoon of a low-analysis fertilizer, such as 12-12-12, with 1 gallon of water. Apply as needed.



If perennial weeds or grasses such as smooth brome, fescue, bindweed, Johnson grass or nut sedge are a problem in the planting area, treatment with an appropriate contact herbicide is recommended the year before planting. Choose an herbicide that does not carry over in the soil.

Care Before Planting

It is extremely important to take care of the plants and stratified seeds from the time they arrive until they are planted. Many trees and seeds die before reaching the planting site because of improper care.

Bare-root Plants

When you receive your order, immediately inspect the trees, shrubs, or seeds. For bare-root plants and stratified seeds, open the box and count the plants and seeds. Report any shortages to the Kansas Forest Service by calling 888-740-8733. Moisten the packing medium, replace the plastic, reclose the box and store in a cool frost-free place. The ideal storage temperature is 33 to 35 degrees Fahrenheit.

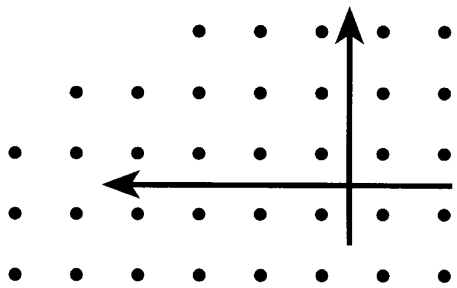
If the weather does not permit immediate planting, leave the plants and seeds in the cardboard box. Check every 3 days to see if the packing medium is moist. The seedlings and seeds will remain in good condition for several days in the box.

If there is a delay of more than a week in planting bare-root plants and they cannot be stored at the ideal temperature, heel them in the ground in a place protected from the sun and wind.

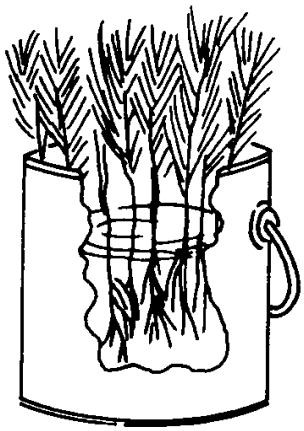
To "heel in" the trees and shrubs, *see Figure 1.*

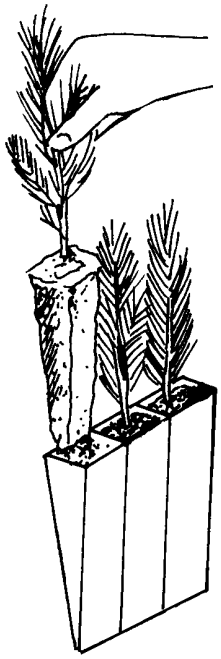
Figure 3

Layout. Mark or flag individual planting spots or rows before planting. Straight rows will simplify cultivation. In Christmas tree plantings and some timber plantings, it may be desirable to cross check rows; that is, space the trees the same distance between rows as within rows. This permits cross cultivation.



Bare Root. To plant bare-root trees and shrubs, remove the seedlings from the box or "heeling in" trench. Seedling root length varies within each bundle or group of plants. To make planting easier, roots can be pruned or cut to a minimum length of 8 inches. This can be done by pruning the entire bundle of seedlings at one time with a sharp knife or hand pruners. Once pruned, place the seedlings in a bucket partially filled with water. Make sure the roots are submerged. Carry the bucket to each planting site, removing the plants as they are needed. Keep seedling roots moist at all times.





Container Plants. Container-grown plants should be carried to the field in their container. Remove the seedling, soil and all, from the container before planting. Remaining trees at the end of the day can be stored in their container in a protected area until needed.

Seeds. Stratified seeds should be taken to the planting site in their plastic storage bag. Remove seeds individually for planting. Rewrap in the plastic bag at the end of the day and store in a cool place.

Plant seedlings in a temporary location before new growth starts. If the plants leaf out and begin growth, wait until the following spring before transplanting to a permanent location.

Container-grown Plants

Container-grown plants can be stored for several weeks in their containers. Place the bundle of containers in a partially shaded area protected from the wind. Do not set the containers directly on the ground or the roots will quickly grow into the soil. Place the containers on blocks or boards. *See Figure 2.*

How To Plant

Planting your trees, shrubs, and stratified seeds properly ensures a high survival rate and good initial growth. Following are recommended procedures for proper planting. *See Figure 3.*

A product called "root slurry" can be used to increase plant survival by protecting roots from drying out during the planting process and keeping the area immediately around the newly planted roots moist while they grow and penetrate the soil.

Root slurry is an organic polymer that holds 500 times its weight in water. Used primarily on bare-root pines, root slurry can be mixed in the bucket of water used to transport seedlings to the planting site or in a separate bucket to dip seedling roots in just before planting.

If trees are remaining at the end of a planting day, replace them in the cardboard box and store in a cool place. **Do not store the plants overnight in the bucket of water.**

Methods of Planting

How seedlings or seeds are planted depends on individual preference and available equipment. Hand-planting with a power auger, shovel or planting bar, and machine planting can all be successful, depending on the method of site preparation used.

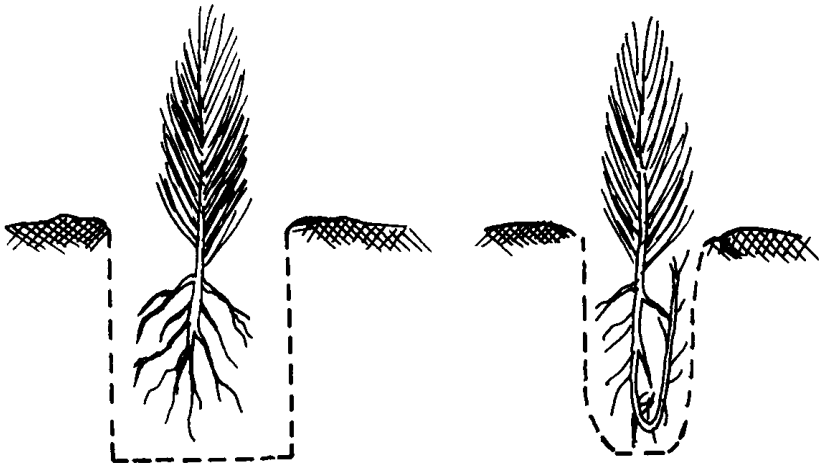
Shovel or Auger (Hand-Planting) *See Figure 4.*

A common problem when using an auger is digging the planting holes too deep. Avoid digging the planting holes more than 2 inches deeper than the length of the seedling roots.

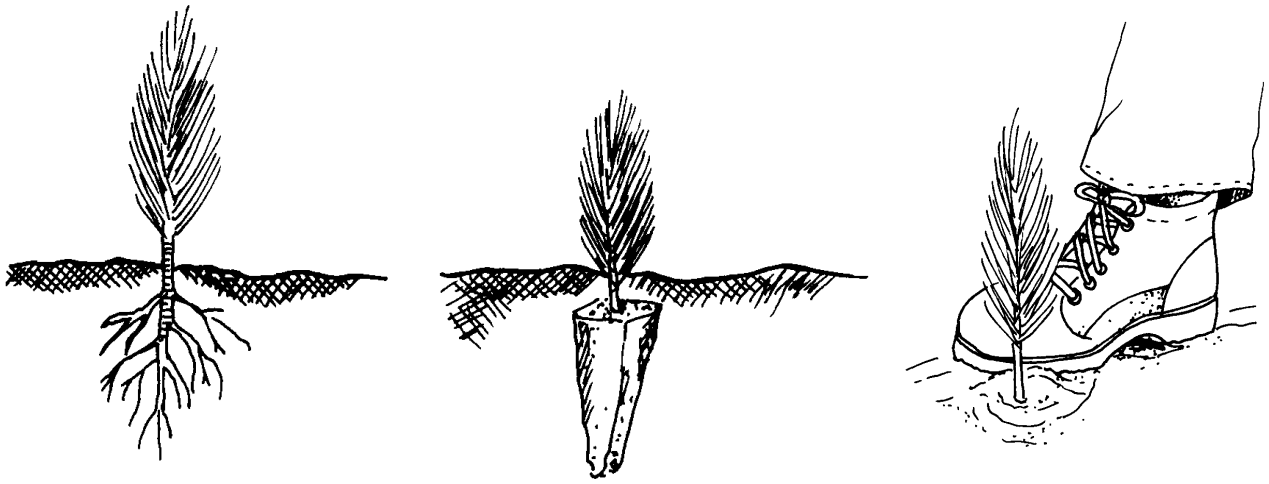
Container-grown seedlings should be planted 1 inch deeper than grown in the container. The potting soil must be covered with 1 inch of field soil to prevent it from drying out.

Digging with an auger in soils high in clay may cause a 'glazing' effect on the sides of the holes. This forces roots to circle in the hole without spreading out as they should. Tree life spans are often greatly shortened by this phenomenon. If the planting holes show

Figure 4



Dig the planting hole large enough to accommodate the entire root system without crowding or bending. This is important because a shallow planting hole, causing the roots to turn up at the bottom, will result in seedling death.



Plant bare-root trees and shrubs the same depth they grew in the nursery. A soil line on the seedling may be visible, indicating plant depth. If the line cannot be seen, at least make sure all lateral roots are covered with soil. Pack moist soil firmly around the roots to remove air pockets and water, if possible.

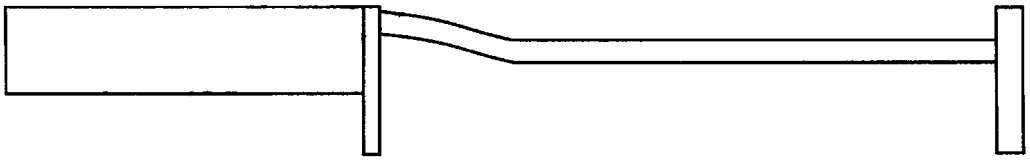
glazing, rough up the sides of the holes with a shovel, sharpshooter, etc. to allow for root expansion.

Planting Bar (Hand-Planting)

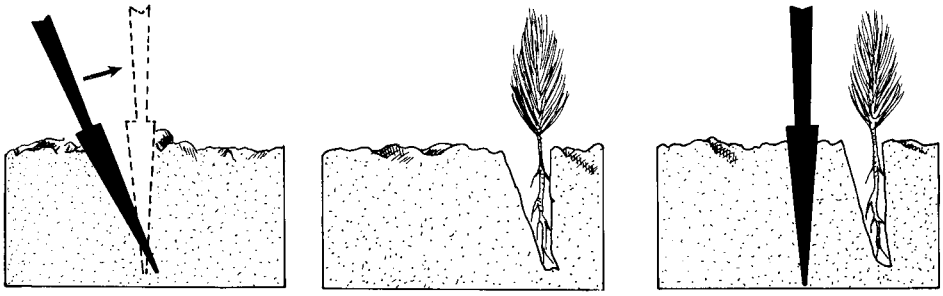
When properly used, planting bars are helpful in planting small bare-root seedlings such as pine, cedar, and shrubs. Planting bars are not recommended for container-grown plants, black walnut, or other large-rooted plants.

One of the most critical steps when using a planting bar is firming the soil around the roots. Often, air pockets remain in the bottom of the slits made by the planting bar, causing the seedlings to die. A series of diagrams illustrates the use of a planting bar *(see Figure 5).*

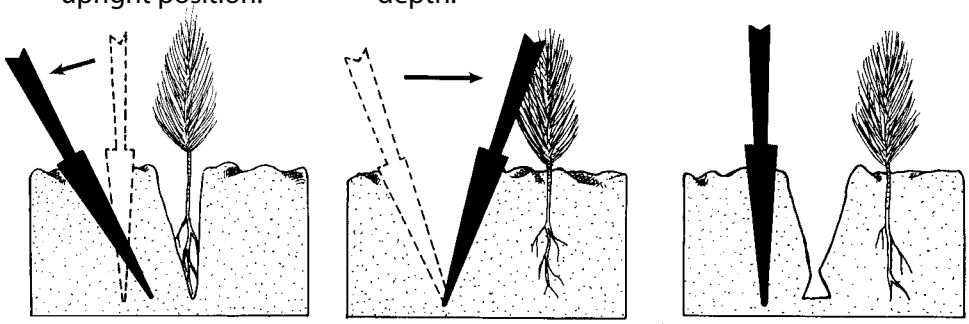
Figure 5



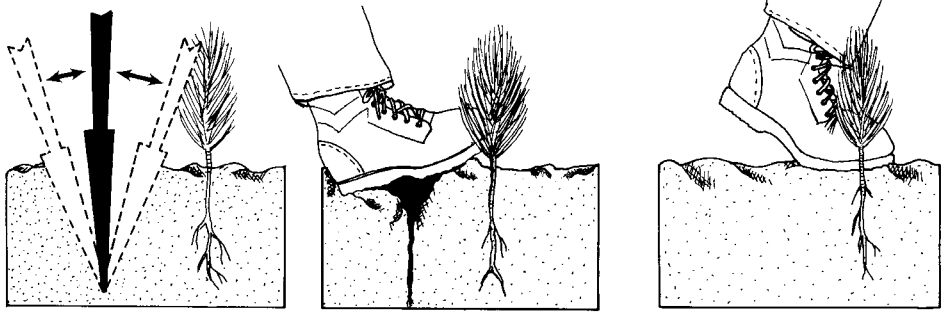
Planting Bar (Person planting is standing to left of seedling).



1. Insert planting bar at angle shown and push forward to an upright position.
2. Remove planting bar and place seedling at correct depth.
3. Insert planting bar 2 inches from seedling.



4. Pull handle of planting bar toward you, firming soil at bottom of roots.
5. Push handle of planting bar toward seedling, firming soil at top of roots.
6. Insert planting bar 2 inches from last hole.

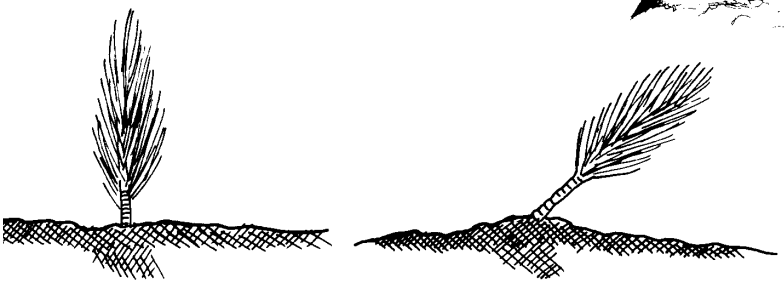


7. Push forward, then pull backward, filling hole.
8. Fill in last hole by stamping with heel.
9. Firm soil around seedling with feet.

811 Know what's below. Call before you dig.

Figure 6

Machine planting is a fast, labor-saving method for large planting jobs (more than 1,000 plants), particularly on light to medium soils Although most tree planting machines have soil-packing wheels, they often do not do an adequate job of firming the soil around seedlings, especially on poorly-prepared sites.



Following behind the planting machine straightening, checking planting depth, and firming the soil around each seedling can increase plant survival.

Figure 7

Mulching each seedling with a 3- to 4-inch depth mat of old straw, hay, corn cobs, or wood chips in a 4-foot-diameter circle around each plant will control vegetation and conserve soil moisture. A monthly mowing in the planting during the growing season is recommended.

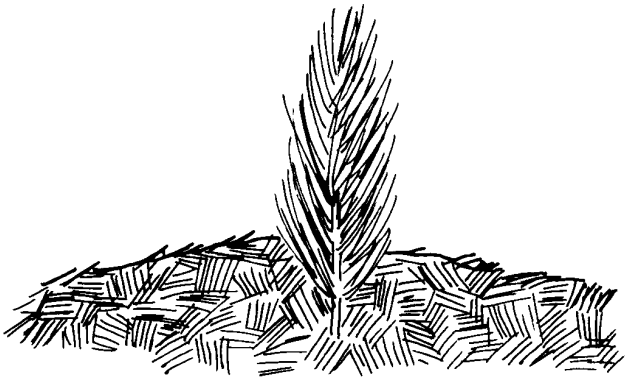
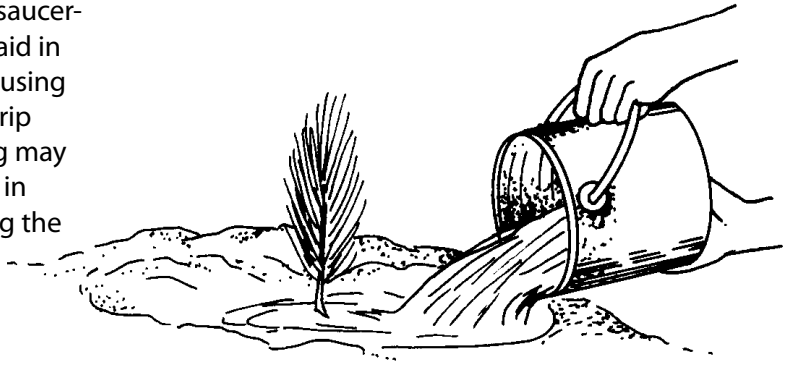


Figure 8

It is helpful when planting to construct a saucer-shaped depression around each plant to aid in watering. Watering can be done by hand using buckets, hoses, or watering tanks, or by drip irrigation. In large tree plantings, watering may not be practical. It is especially important in these cases to do a good job of controlling the weed and grass competition.



811 Know what's **below.** **Call** before you dig.

Machine Planting

Proper site preparation is critical for correct functioning of a machine planter *(See Figure 6).*

Planting Seed

Planting stratified walnut or pecan seeds can be done easily with a solid pipe, a stick, or your foot. Make a small planting hole 1 to 2 inches deep, drop in a seed and cover with soil. It is recommended that 2 to 3 seeds be planted about 1 foot apart at each planting spot to ensure a tree grows at each location. After germination is complete, pull out surplus seedlings.

After-Planting Care

To make use of all available moisture and obtain the best growth, it is necessary to keep the plantings weed and grass free. There are several ways to accomplish this: (1) weed barrier fabric; (2) clean cultivation; (3) strip or spot application of chemical herbicides; (4) mulch; or (5) a combination of two or more of the above.

Weed Barrier

Weed barrier fabric controls weeds and grass within tree and shrub rows while conserving soil moisture. The fabric is manufactured in 4-and-6-foot-wide rolls that are laid directly over the seedlings after planting with a machine pulled behind a tractor. Holes are cut into the fabric at the plant location and the seedlings are pulled through the hole. The machine plows a furrow on each side of the seedling row, lays the edges of the fabric in the furrow and covers the edges with soil to hold the fabric in place. The fabric also comes in 4-foot by 4-foot squares that are installed by hand at each tree location, and then secured by staples.

The fabric is labeled to have a life expectancy of 5 years. However, it often lasts longer than expected. The weed barrier fabric should be removed after 5 years to prevent stem girdling which will kill the trees.

Weed barrier fabric is an excellent means of establishing tree plantings. If the squares are used, weeds and grasses that develop between and within tree rows should be mowed once a month during the growing season, or a cover crop such as grain sorghum can be planted between rows.

Cultivation

Clean cultivation is recommended to control weeds and grasses on non-erodible soils if weed barrier fabric is not used. Shallow (2 to 3 inches) discing between rows once a month during the growing season reduces weed and grass competition. Be sure to keep equipment 12 inches from the seedlings to avoid injury. Hand weeding, chemical herbicide, or mulch applied in a 4-foot-diameter circle around each plant is recommended to control direct weed competition.

Chemical Weed Control

Preemergent chemical herbicides can be applied in a 3-foot-wide band down each seedling row or in a 4-foot-diameter circle around each plant to control germinating weed seeds. **Use chemicals with extreme care in strict accordance with label directions**. Monthly mowing or light discing between rows during the growing season will help reduce weed competition, rodent populations, and the potential for fire damage.

Mulching *(See Figure 7)*

Watering

Water seedlings to supplement precipitation during the growing season, if practical. During extended dry periods, light, sandy soils may require supplemental watering every 5 to 7 days, while plants in heavier clay soils may need watering every 7 to 10 days.

Soil should be physically tested first to ensure watering is necessary. To test for soil moisture, penetrate the soil with soil probe, a shovel (sharpshooter), a screwdriver, or piece of rebar. Feel for evidence of moisture when the penetrating device is removed.

Thoroughly watering plants in the fall before cold weather begins keeps roots in good condition throughout the winter months (*See Figure 8).*

Replacement and Protection

To ensure a complete and uniform planting, it is important to replant all tree and shrub losses during the first and second years. Young trees and shrubs can be protected from rabbits and other rodents with repellents, protective netting, protective tubes, tree shelters, or caging.

Flagging or marking dead trees before the first of September is recommended. This way, dead plants can be easily identified and orders made for replacement plants for the following spring.

Fencing

Livestock must be fenced out of all tree plantings. They compact the soil, reducing air and water movement to the seedling roots, browse on young plants, and step on small seedlings. To have a successful planting where livestock graze, fencing is required.

Help Is Available

Tree-planting machines are available for loan or rent from some County Conservation Districts, Department of Wildlife, Parks and Tourism, and the Kansas Forest Service. In some areas of the state, tree-planting contractors are available to plant and maintain tree and shrub plantings for a fee. A list of these contractors may be found on the Kansas Forest Service website.

For onsite recommendations concerning what species to plant, where to plant, spacing, appropriate herbicides, and repellents, contact your local District Forester, or you can get information from the Natural Resource Conservation Service Area Office, county Conservation District Office, or your K-State Research and Extension office.

Recommended Publications

Chemical Weed Control in Tree and Shrub Plantings, MF656

Conservation Tree Planting Schedule, L871

Fabric Mulch for Tree and Shrub Plantings, MF2216

Kansas Forest Service—Serving Your Needs, L847

Living Snow Fences in Kansas, L744

Planting Black Walnut, L731

Weed Control Options in Tree Plantings, L848

Windbreaks for Kansas, MF2120

John D. Klempa
District Forester, SW

811 Know what's **below.** **Call** before you dig.

Publications from Kansas State University are available at: *www.ksre.ksu.edu*

Kansas State University Agricultural Experiment Station and Cooperative Extension Service

L596 May 2012

K-State Research and Extension is an equal opportunity provider and employer. Issued in furtherance of Cooperative Extension Work, Acts of May 8 and June 30, 1914, as amended. Kansas State University, County Extension Councils, Extension Districts, and United States Department of Agriculture Cooperating, Gary M. Pierzynski, Interim Director.