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GUIDELINES FOR PLANTING LANDSCAPE TREES

Virginia Tech and Virginia State

Virginia's Land-grant Universities

Table of Contents

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Guidelines for Planting Landscape Trees

by

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Introduction

Trees planted around homes, public buildings, commercial industries, and along town and city streets fill several needs. They fill a need for shade, a need for screening, a need for softening the harsh and stark lines of buildings, and a need for adding beauty and graciousness and a feeling of welcome to streets that otherwise are purely functional.

For trees to do their intended job satisfactorily - and continue to do it - they must be selected carefully and watched closely until they become established. Once established, they require less attention.

From a homeowner's perspective, most everyone wants ornamental trees around their property to make it more attractive. But, many people do not realize that good trees provide other benefits and have many more uses around the home and yard. For example:

1. They increase land values. Landscaping adds to the resale value of the property - a well planted, properly maintained property may have its original value increased from ten to fifteen percent. Such a property is also easier to sell.

2. Trees provide a great deal of shelter. They give shade from the hot sun, they eliminate much of the cutting force of strong rains and winds, and they retain moisture in the soil.

3. They can be used to screen unsightly objects or to frame and accent pleasing views and garden features.

4. They help secure privacy by providing eye-pleasing barriers, borders, and hedges.

5. Trees can enrich a pleasant feature in the garden by forming a contrasting background for that feature.

6. They can help prevent soil erosion on steep slopes and banks.

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Where to Plant - Fitting into the Plan

The space or distance between trees is very important. A landscape changes dramatically, though slowly sometimes, as they grow. While spacing depends on your objectives, the site, and the growth habits of the trees to be planted, you should anticipate their mature sizes and avoid planting them so close together or so close to buildings, walks, and driveways that removal or pruning will be necessary when they mature.

What to plant, rather than where to plant, is the question most often asked; but what you plant often depends on where you want to do the planting. When you are deciding where the planting should be done, keep a number of things in mind, such as:

Eye-appeal and Design. Well placed trees will add to the attractiveness of a house or building and its setting. Most often they will look their best behind the house at the corners. A house of predominantly vertical lines or features can be made to appear lower if trees with rounded forms are planted around it. In the same manner, a low, spreading house will appear taller if trees that have columnar or pyramidal shapes are planted.

Trees for Shade. Shade may be one of the most important factors to consider when landscaping with trees. Leaf size and the density of a tree's canopy determine the amount of shade it will provide. Large shade trees are tall enough to shade the roof of a two-story house. Medium-sized trees are large enough to shade the roof of a one-story dwelling or the walls of a two-story building. Small trees will shade an outside wall of a one-story house.

Boundaries or Borders. Trees for hedges or border plantings often do well and add to the overall appearance of a home site if they are planted along the property lines. In this way they provide an enclosure which offers an individuality to the property and its setting within the neighborhood. Also, such plantings may be designed to screen the whole property or specific parts or structures therein.

Trees with Unique Characteristics. Specimen or accent trees may be used in the landscape because they possess some outstanding characteristics such as flowers, fall color, berries, bark color, or unusual foliage. Such trees can be used to enhance the overall attractiveness of a property.

Scale. Avoid using large trees in big groups on small properties and small trees in small groups where the land area is large. If the area is large and the house is larger than average, then large trees, either as individual specimens or in groups, are in keeping with the scale. A planting of this type on a small lot and near a small house will monopolize the area and leave little or no space for outdoor living or circulation about the residence.

Problem Areas. Planting trees under utility lines, in narrow spaces between the street and sidewalk, and over underground utilities, sewers, or septic drain fields may cause serious problems. If the wrong species are improperly placed in such areas, roots and branches might cause service utilities to malfunction. If such areas

must be planted, seek professional assistance in species selection to insure success and avoid future problems.

Sources of Trees

Most of the trees used for landscaping homes, businesses, and public areas are procured from nurseries that specialize in the production of plants well adapted to a given area. In addition to nurseries, there are many garden centers that offer similar selections of landscape trees.

Trees also may be obtained from their native environments; these are referred to as "collected trees", "native species", or "wildlings". If collected trees are chosen for planting, open-grown specimens are hardier and easier to dig than those growing in dense woods.

Native trees, however, do not have the compact root systems or symmetrical branching habits that nursery-grown trees have. Nurseries also offer a wider selection of trees, especially those slower-growing types whose smaller mature size make them desirable for small home grounds. Another advantage of nursery-grown trees is that they often have their roots pruned to stimulate compact root systems that make them easier to transplant. In addition, nursery-grown trees are better because they have been properly trained, watered, and fertilized.

Types of Trees

Trees can be purchased in three different forms: bare-rooted, balled and burlapped (B & B), and container-grown.

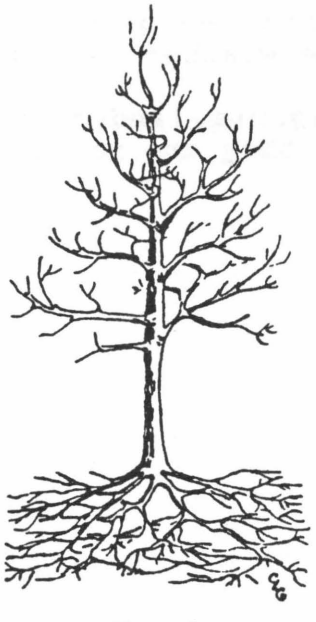

Figure 1

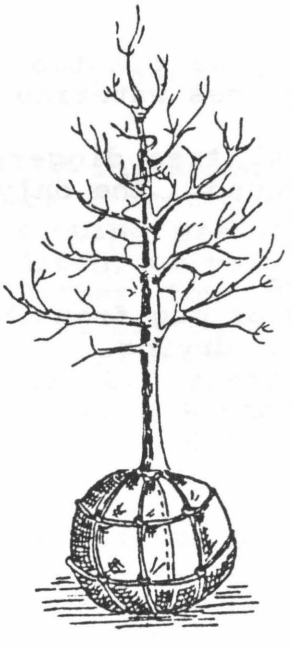

Figure 2

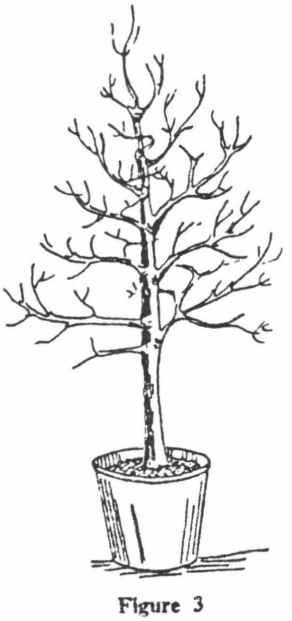

Figure 3

Bare-rooted trees (Figure 1) are usually dormant, small and deciduous. They can be transplanted successfully without a ball of

earth around their roots. They should be planted in the late fall, winter, or early spring while they are still dormant. Bare-rooted stock that has broken dormancy and has new growth of more than two or three inches should not be bought or planted. Evergreen plants, except seedlings or very young plants, should never be bought or transplanted bare-rooted.

Balled and burlapped (B & B) trees (Figure 2) are dug from the nursery row so that their roots remain in balls of soil; roots and soil are then wrapped in protective coverings of burlap. All trees, regardless of their size, can be transplanted balled and burlapped. Many of the larger trees and, especially, the more difficult to transplant species should be moved with a ball of soil. Since the majority of the roots are kept undisturbed, B & B trees can be transplanted successfully throughout the year.

Container-grown trees (Figure 3) have been grown in receptacles that contain their roots. These are becoming more popular because they can be transplanted throughout the year without damaging their roots.

When to Plant

The plant type (bare-rooted, B & B, or container-grown) and the species determine the best time to plant trees. Bare-rooted trees should be planted while they are dormant: in the early spring before growth starts, or in the fall after their leaves have fallen.

Balled and burlapped trees may be transplanted throughout the year. However, the risk of losing trees moved with a ball of soil is greatest during the summer months, and maximum care should be exercised.

Container-grown plants may be planted any time the ground is not frozen. Summer planting requires watering if the weather is dry.

With the use of mechanical tree diggers, Virginia landscapers are planting trees almost year-round. The only time they are not planting is when the ground is frozen.

Care of Trees Before Planting

After trees are purchased or dug from their native environment, the roots must be protected from drying. This precaution is especially important with bare-rooted trees. Soaking the roots of bare-rooted trees for 30 to 60 minutes before planting will insure rehydration of the roots. The soil on a B & B or container-grown plant should be watered enough to prevent drying.

If the plant has leafed-out or is evergreen, protect the branches while it is being transported. If you let the tops of the plants protrude through the end of a station wagon, an automobile window, car trunk, or pick up truck, the leaves, needles, and branches will lose much valuable moisture.

Plant the tree as soon as possible. If you have to wait, protect it from exposure to drying sun and wind in a cool, sheltered, shaded area. If the roots are bare, keep them moist by planting them

temporarily in moist sand, sawdust, peat moss, or soil. The soil of B & B or container-grown trees also should be kept moist.

Bare-rooted and B & B plants that have had parts of their roots removed during the digging operation will perform better if up to one-third of the leaf-bearing branches are removed. This pruning balances the top of the plant with the capacity of the roots to extract water from the soil. Pruning at the time of planting should be concentrated primarily on the small branches on the inner portion of the canopy and a few of the outer terminal shoots. This pruning is a must for trees dug from the wild.

Rough or careless handling of B & B trees can break the soil ball and result in the death of the tree. Never pick up a B & B tree by the trunk as this might break the soil ball. Instead, gently carry the tree by the root ball to the planting site, or contract with the nurseryman to deliver the tree and place it in the prepared planting site.

Cultural Considerations

Soil drainage: Ornamental trees grow best when planted in well drained soils. If you have to plant in areas where water tends to accumulate, try to select species that can tolerate wet soils, or provide some artificial means of draining away the excess water.

The selection of trees that grow satisfactorily in wet soils is limited; therefore, you will probably find it necessary to improve the drainage conditions. A simple method to determine if there is good internal soil drainage is to dig the hole, fill it with water and see if the water drains away within 24 hours. Poor soil drainage can be improved by regrading and filling water-collecting areas, installing underground drain tiles to carry away excess water, or a combination of both.

Drain tiles are most easily installed by digging a straight ditch 12 to 18 inches wide and 2 to 3 feet deep. The bottom of the ditch should be either level or sloping gradually toward a draining area such as a storm-sewer, open ditch, or roadway. Lay the draining tiles end-to-end in the ditch. Either four-inch clay drainage tiles or perforated plastic drainage pipe may be used. Cover the drainage tile with two to three inches of gravel before filling the ditch with soil. When possible, connect rain-gutter downspouts to the drainage tiles. This will help keep the line clean and carry away excess water.

Soil preparation: It is not always possible to follow the sage advice of transplanting a tree in soil at least as good as the soil from which it came. Much of the battle is won, however, if the soil is well-drained, aerated, and retains adequate moisture. Do not plant when the soil is too wet. If soil can be worked up into a rubbery and pliable ball in the palm of your hand, it is too wet; if the soil ball crumbles when pressure is applied, it is right for planting.

Separate and save the top soil when digging the planting hole. Since the subsoil removed from the hole is usually less fertile and contains little organic matter, it is desirable to add liberal amounts

of organic matter such as peat moss, compost, pine bark, or rotted manure. The amended soil should be approximately 1/3 to 1/2 organic matter, by volume. Very rocky soil or heavy clay soil should be replaced with higher quality soil for best results. Organic fertilizers such as cottonseed-meal or bone-meal can be mixed with the soil at two to three cupfuls per bushel of soil mix. Chemical fertilizers and fresh manure should not be used at time of planting because they will cause burning of the roots.

All holes should be dug and soil preparation completed before bringing trees in to plant, so that the time the trees must be out of the ground is minimized. Procedures for planting bare-rooted and balled-and-burlapped trees differ slightly.

Planting bare-rooted trees: Holes should be large enough to permit the roots to be spread out in a normal manner so they are not cramped or twisted. It is not necessary, however, to dig the hole much larger. The hole should be deep enough to allow three or four inches of soil to be placed under the roots. The sides of the hole should be straight and the bottom flat.

Before planting, remove all broken, damaged, or diseased roots with clean, sharp pruning shears. Also, cut back 1/3 to 1/2 of the original length of each large branch. This will reduce the water and nutrient requirements of the tree (see Figure 4).

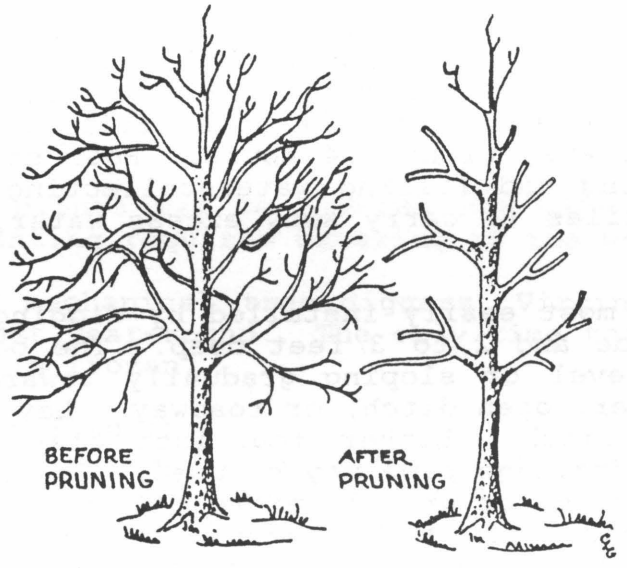

Figure 4

Break up the soil at the bottom of the hole to aid root penetration. Shovel about three to four inches of top soil or prepared soil into the hole, and construct a mound of soil at the center of the hole where the base of the trunk will rest. Place the plant in the hole at the same depth at which it had been growing. This can be easily identified by the dark line on the stem (trunk) near the roots. Spread the roots to their approximate original position and fill the area around the roots with prepared soil. Tamp or pack the soil carefully around the trunk and roots to eliminate air

pockets. Do not bruise or scrape the roots or trunk base. When three-quarters of the hole is filled with soil, water heavily to eliminate all air pockets and to provide for better root-soil contact. Air pockets will cause drying of the roots. Fill the hole, building a ring (berm) of soil two to three inches high around the base of the plant to hold moisture and again fill with water (Figure 5).

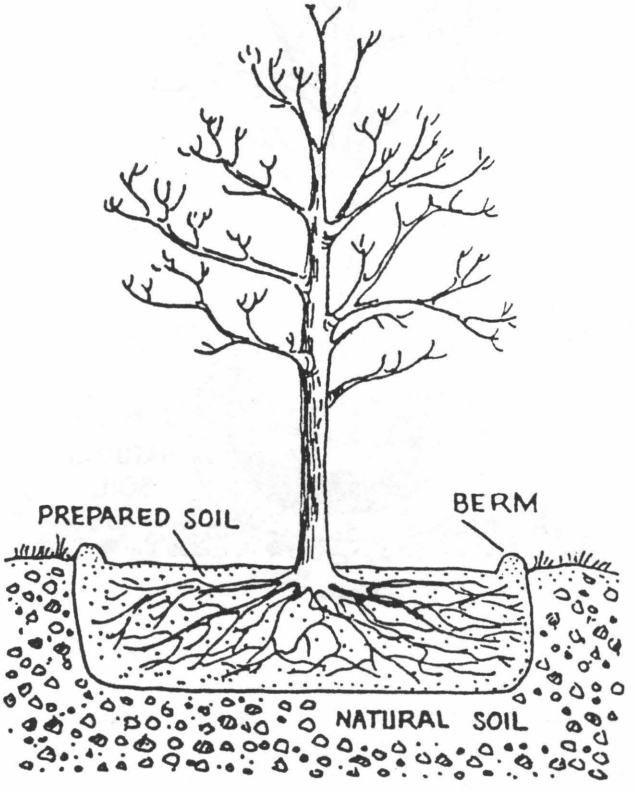

Figure 5

Planting B & B and container-grown trees: B & B trees and those grown in containers have a distinct advantage over bare-rooted trees: their root systems are relatively undisturbed. If this advantage is to be retained, use care to avoid breaking or damaging the root ball.

Holes for planting B & B and container-grown trees should be at least 25 percent larger in diameter than the balls they will hold. The hole should be deep enough to allow several inches of prepared soil to be placed beneath the ball. Place the tree in the hole so it is at the same or slightly above the level it was grown in the nursery or container. The burlap does not need to be removed, but it should be untied or loosened and lowered around the ball so it does not stick out of the soil and act as a wick that removes moisture from the root ball (Figure 6). If a plastic-like burlap was used, then this should be removed to allow moisture to penetrate the root ball.

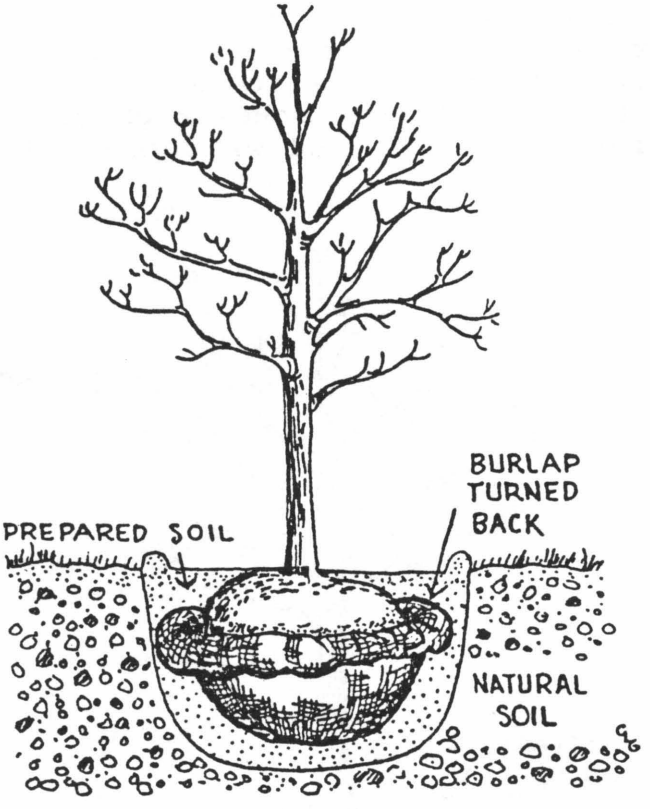

Figure 6

When planting container-grown trees, remove them from their containers carefully so the balls of soil are not broken. The best way to remove a container is to cut it from top to bottom in four places 90-degrees apart; gently pull the four cut sides away from the root ball (like peeling a banana); then gently tap the container until it falls away from the root ball.

For planting a tree that has a ball of soil around its roots, the bottom of the hole should be filled with enough prepared soil to raise the tree to its original planting depth, the top of the ball of soil. Place the plant in the hole and pack prepared soil around the ball by hand until half of the ball is enclosed. Then fill the hole with water to settle the soil more firmly. When the water has drained, finish filling the hole with soil. Provide a ring of soil (berm) two to three inches deep around the base of the plant to hold moisture and again fill with water (Figure 6).

Staking - supporting trees. All newly planted trees should be supported, no matter how tall. Supports stabilize trees until their roots can penetrate the surrounding soil and anchor them firmly. Supports also help the proper training of trees, and often protect their trunks from damage by lawn mowers and "weed eaters". Depending on the tree size, staking or guying techniques may be employed.

For small trees up to and including those from two to three inches in trunk diameter, two or three stakes should be used. The stakes

should be long enough to extend from just above the lowest branches of the tree into the soil far enough to be firmly stable. The stakes are usually positioned, in firm soil just beyond the edge of the hole, so that the trunk is located between them (Figure 7). The trunk is connected to the stakes with pieces of coarse cord, soft rope, or wire that is padded with old garden hose (this keeps the wire from cutting into the tree).

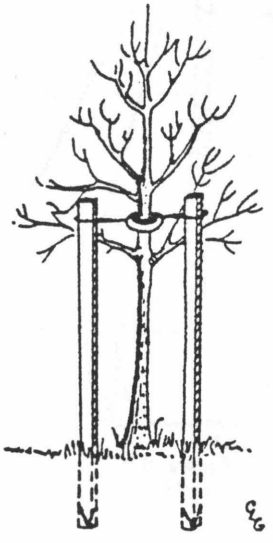

Figure 7

Trees larger than three inches in diameter should be stabilized with a system of three guy wires or cables (Figure 8a). About half-way up the trunk, one end of each cable should be padded and slipped around the crotch of a limb and the trunk. The lower ends of the cables should be secured to stakes, or "deadmen", buried in the soil. The installed guys should form a 45-degree angle with the ground. Turn-buckles can be used to adjust the tension of the guys (Figure 8b).

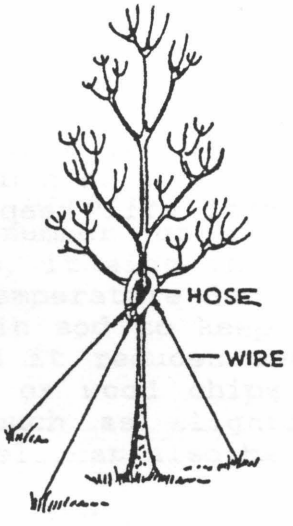

Figure 8a

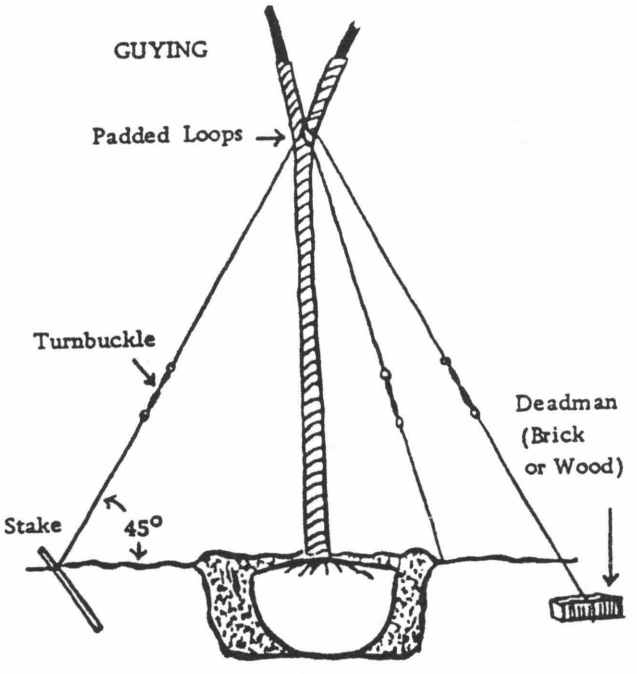

Figure 8b

It is best to leave the supports on the tree for the first growing season or until the roots have become firmly established in the surrounding soil. On large trees, the supports should remain two years or more.

Wrapping: The tree trunk and large branches of most trees should be wrapped for the first two years with burlap or special kraft tree paper to protect the bark from direct sun rays (which may cause sun scald), to prevent excessive loss of water, and to reduce borer infestation. For availability and appearance, crepe tree-wrapping paper is probably best.

On large trees, wrap from the ground line to the point of branching and include the lower branches. For small trees, wrap from the ground line to the point of branching. The wrap should look like a spiral; each turn should overlap one-half the width of the material so that each point on the trunk is covered with a double thickness. Constant tension on the wrapping material will keep it from slipping (Figure 9).

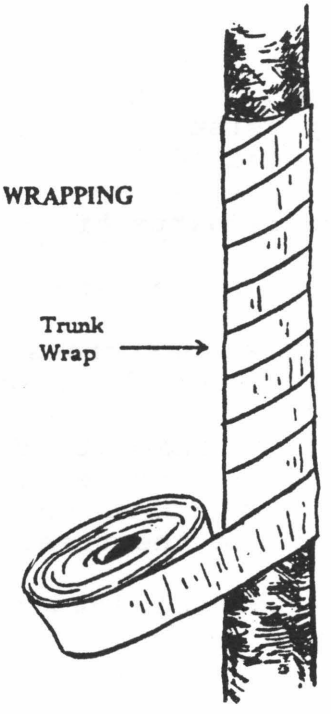

Figure 9

Watering: Tree survival will depend, to a great extent, upon watering during the dry periods of the first growing season (including the fall months). Watering heavily once a week during dry periods is adequate if the tree is properly mulched. If the tree is too frequently watered, root injury and eventual death could occur.

Container-grown trees (and, to a lesser degree, B & B trees) require special attention with regard to watering. The root balls of these trees tend to dry out much faster than the surrounding soil. Consequently, it is important to know the area the root ball encompasses and to be sure to water the root ball itself thoroughly. It is crucial to check the root ball to determine when rewatering is needed because the moisture content of the surrounding soil can be misleading.

Mulching: The addition of a two-inch to five-inch layer of mulch around the tree has a number of benefits: it greatly aids in preventing soil water loss, it aids in holding soil heat during cold periods, it reduces soil temperature during hot weather, it provides a buffer zone around trees in sod to keep lawn mowers and weed eaters away from the trunks, and it reduces weed problems. Pine straw, a mulch grade of pine bark or wood chips are excellent for mulching trees. Other materials such as slightly decomposed leaves, grain straw, or even coarse gravel, can also be used successfully.

Removing labels: Remove any wires or cords used to attach labels to trees. These bindings will eventually girdle their branches or trunks.

Pruning: Inspect your shade trees regularly to determine when they need pruning. Pruning will improve their appearance, guard their health, and make them stronger. And, by pruning as soon as the need becomes apparent, you can easily correct defects that would require major surgery if allowed to persist. Here is a list of things to look for when determining pruning needs.

- Dead, dying, or unsightly parts of trees.
- Sprouts growing at or near the base of the tree trunk.
- Crossed branches. If branches cross and rub together, disease and decay fungi can enter the tree through the abrasions.
- V-crotches. If it is possible to do so without ruining the appearance of the tree, remove one of the members forming a V-crotch. V-crotches split easily; their removal helps prevent storm damage to the tree.
- Multiple leaders. If several leaders develop on a tree that normally has only a single stem, and you wish the tree to develop its typical shape, cut out all but one leader.
- "Nuisance" growth. Cut out branches that are likely to interfere with electric or telephone wires. Remove branches that shade street lights or block the view into streets and constitute a traffic hazard. Prune branches that shut off breezes, and remove lower limbs that shade the lawn excessively.

Do not leave stubs when you prune. Stubs usually die and they are points at which decay fungi can enter the tree. Seal each wound by applying a protective material such as Tree Kote.

Fertilizing: Trees are not likely to need fertilizer for the first year after planting if plenty of good soil was used for backfilling the holes in which they were planted. If you think a tree needs fertilizer (its leaves are paler than normal or its growth is slower than normal), you may be fertilize it from late fall through early spring.

Usually, dry fertilizers are not incorporated directly into the fill used during tree planting because of the risk of root injury. A 20-20-20 (or similar analsysis) fertilizer should be diluted at the rate of one tablespoon per gallon of water to serve as a starter solution. The entire root zone of the tree can be safely drenched with this solution. Apply the soilution when the soil is moist. A well fertilized lawn provides adequate fertilizer for the trees it surrounds or borders.

Protecting from insects, diseases, and mechanical injury. Most insects and diseases can be controlled by spraying with appropriate and recommended pesticides. Your local Virginia Cooperative Extension Service agent, local nurseryman, or garden center personnel can identify the pest problem and tell you what spray to use and when to use it. When trees are small, you can spray them yourself. As they

grow larger, however, spraying becomes a job for professional arborists who have the equipment and knowledge required to do a thorough job.

To some extent, stakes and guy wires that support a newly planted tree will also protect it from mechanical injury. But, if you believe the tree needs additional protection from mowers and animals and other sources of possible injury, you may install a fence that surrounds it. Be sure that the fence extends from ground level to an appropriate protective height.