

# **MAINTENANCE GUIDEBOOK IV LANDSCAPE AND GENERAL GROUNDS MAINTENANCE CHAPTER TWO - TREE CARE**

## **SECTION A GENERAL**

### **1. INTRODUCTION**

This chapter presents selected information for effective and economical maintenance of trees. The intent is not to limit or restrict HAs in programming or developing practices compatible with their own environments, but to offer guidelines. HAs are encouraged to obtain additional information from such local resources as the County or State Cooperative Extension Agents, agronomists and horticulturists, and local university or college environmental and agricultural extension services.

### **2. RESIDENT COOPERATION**

Successful upkeep of trees requires attention from both residents and grounds personnel, and demands continued maintenance by staff on a year-round basis. See Chapter One, Section A-3, for information on the importance of resident cooperation.

### **3. EQUIPMENT AND MATERIALS**

The following is a list of tools commonly required in the maintenance of trees.

- Telescoping Pole Pruner for removing small upper branches;
- Lopping Shears for removing large, lower branches;
- Pruning Shears for removing small, lower branches;
- Power Saw for pruning large branches or stems;
- Hand Saw for pruning small branches.

Materials commonly required in routine maintenance include:

- Fertilizer: slow-release type most recommended. See Chapter One, Section C-9.
- Mulch: shredded hardwood bark, pine nuggets, or needles. See Chapter Two, Section E.
- Lime: ground dolomitic limestone. See Chapter One, Section C-2.
- Water: available from individual development or city source; should be tested once a year for chlorine, fluoride, and salt.

## **SECTION B SELECTION**

Clean, simple, but effective planting arrangements can be achieved with trees, lawns, and the minimal use of shrubs. The use of a limited plant palette will assist in the establishment of a common development-wide image. Properly selected trees are more effective for environmental control, and ultimately will require less maintenance because of similar growth and maintenance requirements. Choose only those capable of thriving with low maintenance and producing the desired effect. See Appendix B, USDA Plant Hardiness Zone Map, to identify the hardiness zone for which trees will be selected, then see Section C, Tree List, for specific species that will grow in each zone.

Deciduous trees offer a wide variety of effects because of seasonal changes, flowers, berries, fruit, and color and texture of bark. Because evergreen trees provide green color and contrasting background when deciduous plants are leafless, they should comprise about 60% of a planting design, if possible. In addition, the use of indigenous trees is recommended, since their water and maintenance requirements are lower than for ornamental varieties.

## SECTION C TREE LIST

### LARGE TREES - 40' AND UP

Botanical Name COMMON NAME	Zone	Form	Height Spread	Growth Rate	Group	Remarks
<i>Acer floridanum</i> FLORIDA MAPLE or SOUTHERN SUGAR MAPLE	8-10	Oval	<u>40-50'</u> 20-25'	M-F	D	Shade, orange to red fall color
<i>Acer rubrum</i> RED MAPLE	4-9	Rounded	<u>40-50'</u> 25-35'	M	D	Shade, red fall color, tolerates many soils
<i>Betula nigra</i> RIVER BIRCH	5-9	Oval	<u>50-60'</u> 40-50'	F	D	Specimen, tolerates wet soil, attractive exfoliating bark
<i>Cryptomeria japonica</i> JAPANESE CRYPTOMERIA	5-9	Pyramidal	<u>50-60'</u> 20-30'	F	C	Specimen, screening
<i>Cupressocyparis leylandii</i> LELAND CYPRESS	6-9	Pyramidal	<u>50-60'</u> 20-30'	F	C	Specimen, screening
<i>Fagus grandifolia</i> AMERICAN BEECH	4-9	Rounded	<u>50-80'</u> 50-80'	M-F	D	Rich, well-drained soil
<i>Fraxinus americana</i> WHITE ASH	4-9	Spreading	<u>50-80'</u> 50-80'	F	D	Shade, yellow fall color, tolerates many soils
<i>Ginkgo bilboa</i> GINKGO OR MAIDEN HAIR TREE	5-10	Irregular	<u>50-70'</u> 30-400'	VS	D	Yellow fall color, specimen, select male trees, drought- tolerant
<i>Gleditsia triacanthosiuermis</i> HONEY LOCUST	3-9	Rounded	<u>40-70'</u> 30-40'	M	C	Plant for light shade
<i>Koelreuteria bipinata</i> CHINESE FLAME TREE	7	Irregular	<u>20-30'</u> 15-20'	M-F	D	Excellent where space is limited
<i>Liquidambar styraciflua</i> SWEETGUM	6-9	Pyramidal	<u>80-100'</u> 40-50'	F	D	Yellow to orange fall color, prefers wet soil
<i>Magnolia grandiflora</i> SOUTHERN MAGNOLIA	7-9	Upright, pyramidal	<u>60-80'</u> 400-50'	S-M	BLE	Specimen, large white flowers, messy leaves
<i>Metasequoia glyptostroboides</i> DAWN RED WOOD	6-9	Upright	<u>80-100'</u> 30-40'	F	D	Shade, specimen
<i>Nyssa sylvatica</i> BLACK TUPELO	5-9	Oval	<u>70-80'</u> 40-500'	M	D	Pest-disease resistant
<i>Phoenix canariensis</i> CANARY ISLAND DATE PALM	G	Upright	<u>60'</u> 30'	S	E	Refined form, specimen & emphasis plant
<i>Phoenix dactylifera</i> DATE PALM	G	Upright	<u>60'</u> 25'	S	E	Specimen & emphasis plant
<i>Pinus virginiana</i> VIRGINIA PINE	6-9	Horizontal branching	<u>40-50'</u> 15-20'	M	C	Good for screening tolerates poor soils
<i>Pistacia chinensis</i> PISTACHIO	6	Oval and rounded	<u>25-40'</u> 25-35'	M-F	D	Excellent fall foliage color, adaptable to moist soil conditions

Botanical Name COMMON NAME	Zone	Form	Height Spread	Growth Rate	Group	Remarks
Platanus xacerifolia "Bloodgood" LONDON PLANE-TREE	6	Rounded	70-100- 50-70'	F	D	Very long-lived withstands worst city conditions
Quercus agrifolia CALIFORNIA LIVE OAK	G	Upright	50 20-25'	S	D	Quality tree, formal and contained
Quercus alba WHITE OAK	4-9	Rounded	80-100' 40-50'	S	D	Shade
Quercus coccinea SCARLET OAK	4-9	Rounded	60-80' 30-40'	M	D	Scarlet fall color, shade
Quercus falcata SOUTHERN RED OAK	6-9	Rounded	70-80' 30-40'	M	D	Sheds leaves in early spring, shade
Quercus nigra WATER OAK	5-9	Rounded	80-90' 40-50'	M-F	D	Shade
Quercus palustris PIN OAK	5-9	Pyramidal	70-80' 40-50'	M	D	Shade, specimen, tolerates many soils
Quercus phellos WILLOW OAK	6-9	Rounded	80-100' 40-50'	M	D	Yellow fall color, shade
Sophora japonica JAPANESE PAGODA TREE	5-9	Spreading	50-60' 40-50'	F	D	Street tree, shade
Thuja occidentalis AMERICAN ARBORVITAE	3-9	Pyramidal	50' Varies	M	C	Dense foliage
Tilia cordata EUROPEAN LINDEN	5-9	Pyramidal	60-70' 30-40'	F	D	Fast, hardy growth
Washingtonia Robusta MEXICAN WASHINGTON PALM	G	Upright	60-100' 12'	F	E	No special care required
Zelkova serrata JAPANESE ZELKOVA WATER OAK	6-9	Upright, rounded	60-80' 30-40'	F-F	D	Shade, streets, won't tolerate wet soil

Growth Rate

S - Slow  
M - Medium  
F - Fast  
VS - Very Slow

Group

BLE - Broad-leaved Evergreen  
C - Coniferous  
D - Deciduous  
SE - Semi-Evergreen

## SMALL TREES - 10' TO 40'

Botanical Name COMMON NAME	Zone	Form	Height Speed	Growth Rate	Group	Remarks
<i>Acer palmatum</i> JAPANESE MAPLE	6-9	Horizontal Branching	<u>15-20'</u> 10-15'	M	D	Specimen, red foliage, moist well-drained, rich soil
<i>Amelanchier arborea</i> SERVICEBERRY	5-9	Oval	<u>30-40'</u> 15-20'	M	D	Borders; white flowers in early spring
<i>Cercis canadensis</i> REDBUD OR JUDAS TREE	5-9	Oval	<u>25-30'</u> 18-20'	M	D	Spring flowering; tolerates many soils
<i>Cercis japonica</i> CHINESE REDBUD	5-9	Oval	15-20' 10-12'	M	D	Small flowering tree
<i>Chionanthus virginica</i> FRINGE-TREE OR GRANCY GRAYBEARD	5-9	Irregular	<u>10-20'</u> 10-15'	S-M	D	White flowers
<i>Comus florida</i> DOGWOOD	5-9	Horizontal Branching	<u>10-25'</u> 15-20	S	D	Specimen or masses, moist well-drained acid soil
<i>Halesia carolina</i> SILVERBELL	6-9	Spreading	20-30' 15-20'	M	D	White flowers
<i>Ilex aquifolium</i> x <i>I. comuta</i> 'Nellie R. Stevens' NELLIE R. STEVENS HOLLY	6-9	Upright	<u>10-20'</u> 8-10'	M-F	BLE	Specimen, screening
<i>Ilex</i> x <i>attenuata</i> hybrids HYBRID HOLLY	6-9	Upright Pyramidal	<u>10-20'</u> 6-10'	M	BLE	Specimen, screening; red berries
<i>Ilex cassine</i> CASSINE HOLLY	5-9	Pyramidal	<u>10-20'</u> 8-10'	M	BLE	Screening, moist soil
<i>Ilex opaca</i> AMERICAN HOLLY	5-9	Pyramidal	<u>20-30'</u> 15-20'	M	BLE	Dark green foliage; specimen, screening
<i>Ilex opaca</i> 'Croonenburg' CROONENBURG HOLLY	5-9	Upright	<u>20-30'</u> 10-15'	M	BLE	Compact growth habit
<i>Ilex vomitoria</i> YAUPON HOLLY	7-10	Pyramidal	<u>10-20'</u> 8-10'	F	BLE	Screening, hedge
<i>Ilex vomitoria</i> 'Pendula' WEEPING YAUPON HOLLY	7-10	Weeping	<u>15-20'</u> 8-10'	M-F	BLE	Distinctive weeping habit
<i>Koelreuteria paniculata</i> GOLDENRAIN TREE		Rounded	<u>20-30'</u> 10-15'	M	D	Yellow flowers, tolerates many soils and drought
<i>Lagerstroemia indica</i> CRAPE MYRTLE	7-10	Upright	<u>20-30'</u> 10-15'	F	D	Long-lasting white, pink or red flowers; drought- tolerant
<i>Magnolia soulangiana</i> SAUCER MAGNOLIA	5-10	Rounded	<u>20-30'</u> 15-20'	M	D	Pink, saucer-like blooms
<i>Magnolia stellata</i> STAR MAGNOLIA	5-10	Rounded	<u>12-20'</u> 10-15'	S-M	D	White flowers
<i>Magnolia virginiana</i> SWEETBAY MAGNOLIA	6-9	Upright	<u>15-20'</u> 10-20'	S	SE	White flowers in summer; well-drained soil
<i>Malus angustifolia</i> SOUTHERN CRABAPPLE	5-9	Horizontal	<u>15-25'</u> 10-15'	M	D	Fragrant pinkish white flowers
<i>Malus</i> 'Dolgo' DOLGO CRABAPPLE	5-9	Rounded	<u>15-20'</u> 10-15'	M	D	White flowers

Malus x 'Dorothea' DOROTHEA CRABAPPLE	5-9	Rounded	$\frac{15-20'}{15-20'}$	M	D	Pink flowers, yellow fruit
Malus floribunda JAPANESE CRABAPPLE	5-9	Rounded	$\frac{15-20'}{15-20'}$	M	D	Pinkish-red flowers
Malus prunifolium 'Callaway' CALLAWAY CRABAPPLE	5-9	Rounded	$\frac{15-20'}{15-20'}$	M	D	Pink buds, white flowers
Oxydendrum arboreum SOURWOOD	5-9	Upright	$\frac{30-40'}{15-20'}$	M	D	Red fall color
Prunus caroliniana CAROLINA LAUREL CHERRY	6-9	Oval	$\frac{20-30'}{15-20'}$	M	D	Pest free, attractive foliage, good wind break
Prunus yedoensis YOSHINO CHERRY		Weeping	$\frac{30-40'}{15-20'}$	M	D	Specimen
Pyrus calleryana 'Bradford' BRADFORD PEAR	6-9	Upright, Rounded	$\frac{35-40'}{15-20'}$	M-F	D	White flowers, red fall color, tolerates many soils and drought

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<u>Growth Rate</u>	<u>Group</u>
S - Slow	BLE - Broad-leaved Evergreen
M - Medium	C - Coniferous
F - Fast	D - Deciduous
VS - Very Slow	SE - Semi-Evergreen

## **SECTION D PLACEMENT AND SPACING**

From time to time it becomes necessary to plant and transplant trees. The selection and placement of trees should be sensitive to the existing landscape and local climatic conditions, and the spacing of trees is a design detail that should be considered carefully. Trees can be clumped, used as a single specimen, be in an open line or in a closed line as a screen. In spacing trees, keep in mind that lawns are simpler to mow if trees are planted in shrub beds or ground-cover areas.

Planting street trees is one of the most effective means to visually complement and define the hierarchy of roads in a housing development. Street-tree planting should be used along the principal circulation routes to give them a positive visual image. Trees and shrub planting can also be used to modify conditions of temperature, glare, wind, dust, and smoke. Canopy shade trees block and filter the sun and help to reduce heat gain along building walls and windows. Trees should be located a minimum of twenty feet from structures to provide adequate room for growth. In addition, parking lots, paved areas, streets, and walkways should be shaded by trees or structures to reduce temperatures and glare in the summer.

Trees and shrubs should be carefully located in regions where the clayey subsoil is the shrinking/swelling type. In these areas, trees and shrubs should not be located closer to building foundations than a distance equal to their mature height. This should prevent roots from drawing moisture from the subsoil, causing the soil to shrink around the foundations.

## **SECTION E MULCHING**

Mulching is the application of shredded bark or other appropriate materials over the soil around plants. Mulch is typically placed in rings around individual trees or in greater mulch beds comprising a cluster of trees and other plants. It has several significant benefits, including:

- Limiting water evaporation, thereby reducing the amount of watering required;
- Discouraging weed growth, reducing the amount of weeding required;
- Adding organic matter to the soil;
- Creating an attractive textured appearance.

Any change in the physical and chemical properties of the soil resulting from the application of organic mulch is influenced by the presence and population of soil micro-organisms. These bacteria are generally considered beneficial because they increase upper soil-surface granulation, improving growth. Increasing soil granulation of compacted soils improves percolation of water downward through the root zone and allows flushing away of accumulations of carbon dioxide (CO<sub>2</sub>), bringing air and oxygen to the root zone.

## 1. MULCH TYPES

Some organic materials, such as corncobs, peat moss, mulch, straw, sawdust, pine needles, shredded bark, and wood chips, are practical as a soil-surface mulch. They are also used as an in-soil mulch, although they contribute very few nutrients to the soil. When used as in-soil mulch, the soil will require supplemental applications of nitrogen, and possibly even a complete fertilizer. Soil micro-organisms remove nitrogen from the soil during the process of decomposing the mulch materials. The type of mulch to use depends on what is available locally. Factors to consider in mulch selection include costs, weight, and rate of decomposition. There are counties, cities, and towns where mulch is available free of charge.

**Oak leaves** contain and contribute acid to the soil. If leaf mulch is left to weather, the acid will eventually be leached out, leaving an alkaline base. This is also true for most animal manures. **Sphagnum moss** will leave a very acidic residue in the soil; therefore it is excellent for plants which thrive in a low pH (acidic) soil, such as azaleas, holly, hydrangeas, and rhododendron. **Black plastic sheeting** is not a desirable substitute for organic mulch. The plastic will gradually deteriorate and become a nuisance as weeds begin to invade the planting area. Organic mulches, on the other hand, can easily be added to as needed.

## 2. QUANTITIES

A minimum mulch depth of 2-3 inches should be maintained at all times. Some plant species may require a greater depth to retain adequate levels of moisture in the soil. Mulch is best rejuvenated after weeding.

## 3. FREQUENCY AND TIMING

Fresh mulch should not be applied until the existing mulch is nearly all decomposed. A shallow raking will give the plant bed a fresh appearance in the meantime. In general, mulch should be applied twice annually to replace what is lost due to deterioration, wind, water erosion, or removal. Mulch should be ordered well in advance of the application date.

Prior to mulching, several other tasks should be completed:

- Weeding and edging the plant bed;
- Fertilization;
- Removal of trash, leaves, and debris from plant bed.



#### **4. APPLICATION**

Apply mulch as follows:

- Spread mulch around tree and rake lightly for evenness and appearance.
- The depth of finished mulch beds should be no less than two inches.
- Keep mulch six inches away from a woody plant's main leader (trunk).
- Maintain a foot collar around all trees in lawn areas to protect trunks from mechanical damage.

Calculate the foot collar diameter as one foot for every inch of caliper (trunk diameter) of the tree.

### **SECTION F PRUNING**

Pruning has a variety of benefits, including:

- Compensating for root loss and improving water balance (at time of planting);
- Shaping plant habit;
- Removing damaged or diseased limbs;
- Enhancing future growth;
- Maintaining a natural symmetrical appearance.

See Chapter Eight - Checklists, for information on coordination of pruning with other landscape maintenance activities.

#### **1. ASSESSING PLANTS FOR PRUNING**

Prune damaged trees and those posing a health or safety hazard. Prune storm-damaged trees immediately following storms. See Figure 2-1 for specific pruning methods. Prune out:

- Dead or dying branches and twigs;
- Suckers growing at or near the base of the tree;
- Branches growing towards the center of the tree;
- Branches crossing to the interior of tree that restrict growth of primary leaders;
- Crossed branches (remove the one which affects the shape the least);
- Narrow "V-crotches," if it is possible without ruining the appearance;
- Multiple leaders; if several developed where one is normal, remove all but one;
- Nuisance growth; cut branches that interfere, or will interfere with, electric or telephone lines.
- Limbs that shade lawns excessively;
- Branches in pedestrian areas less than 8 feet high, unless the habit is naturally low-branching;
- Low branches of canopy trees in conflict with trucks or buses.

Maintain a minimum of twelve feet clear height. Prune smaller trees gradually each year, until their low branches reach the minimum clearance height of twelve feet. Maintain a natural symmetrical appearance.

## **2. TECHNIQUE**

Always prune with a clean cut into living wood without bruising or tearing bark or leaving "stubs" which could prevent healing. Horizontal cuts may cause rot and should be avoided. For hand-shear pruning, cut 1/4-inch above a side bud at approximately a 45 degree angle. For saw pruning, cut halfway through underside of the branch, two to three inches above the crotch. Make a second cut on the upper side of the branch and remove it. Saw branch flush to tree.

Dispose of all trimmings, deadwood, windfalls, logs, and other pruning products off-site in accordance with applicable requirements of regulatory agencies having jurisdiction. Landscape trimmings should be made into mulch and recycled, unless they are diseased.

## **SECTION G WATERING**

### **1. GUIDELINES FOR WATERING**

Refer to Chapter One, Section I, for specific information on irrigation systems. Some general guidelines for watering are as follows:

- Check all spigots, hose connections, and sprinklers for leaks before leaving area.
- Hoses for manual watering should not be laid across public walks. However, if it is absolutely necessary, take the following precautions:
  - Lay hoses either parallel or perpendicular to the walk.
  - Place signs or cones nearby to warn people of the trip hazard.
  - Remove hoses promptly when not in use.
  - Never leave a hose across a walk overnight or during weekends or holidays.

### **2. QUANTITIES**

The amount of water required varies with circumstances. As a general rule, trees should be watered to a depth of 8-12 inches, or one inch of water per week (two inches in hot, dry periods.) This encourages deeper root growth and helps to decrease initial drought stress. To determine how long to water in order to produce one inch of water, place a pan in areas being watered and time the rate

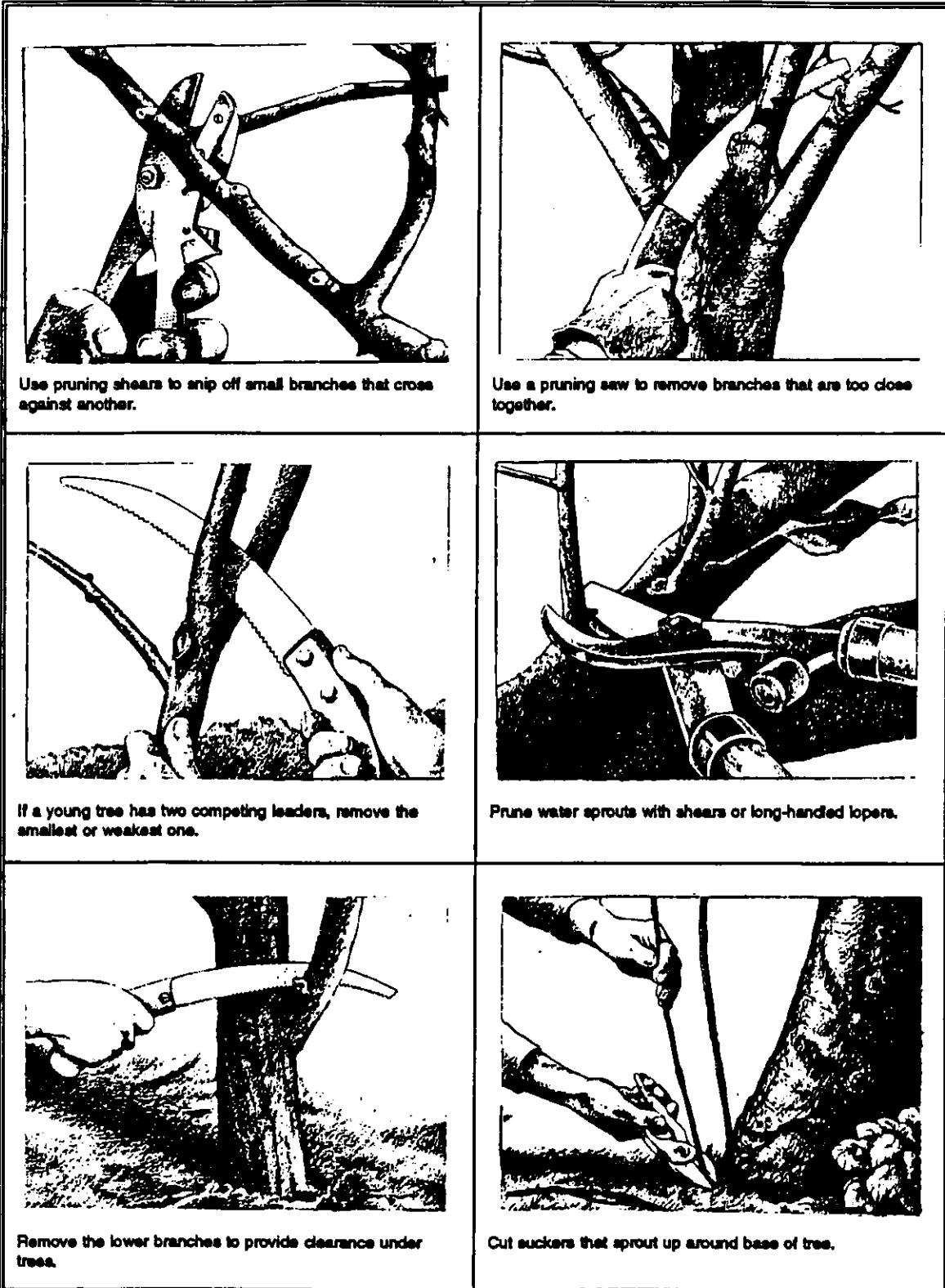


Figure 2-1: Tree-Pruning Technique

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of accumulation. If, for example, it takes one hour for the pan to accumulate one inch of water, an hour is the minimum length of time to water.

- It is important to water the ground thoroughly, soaking it to a depth of 12 inches.
- Watering should not produce run-off. There should not be any flow of water across sidewalks, nor washing away of mulch and soil. Water may run off before one inch is applied in areas with heavy clay soils or compaction. In this case, several smaller applications during the week may be necessary to get the proper watering depth.

### **3. FREQUENCY**

Desirable watering frequency varies greatly from location to location, depending on climate. As a general rule, it is recommended that all necessary watering be performed one to two times a week (except when the ground is frozen) to establish optimum growing conditions. During periods of drought and intense heat, the frequency should be increased as needed, and during periods of extensive precipitation, watering should be decreased accordingly.

- Young trees require more frequent watering than older, more established trees.
- Watering is best done in the early morning to reduce evaporation (which would occur with mid-day watering) and to reduce the potential for mildew growth (which would occur with an evening watering).

## **SECTION H FERTILIZING**

Fertilization promotes good color, stimulates growth, and enhances a plant's ability to survive adverse environmental conditions and disease. Fertilizing on a regular basis is especially important in urban environments, where natural sources of nutrients are severely limited. Refer to Chapter One, Section C-1, Soil Sampling and Testing, for soil-testing procedures, before beginning a fertilization program.

### **1. SELECTING A FERTILIZER**

The three main elements found in fertilizers are:

- Nitrogen (N), which encourages rapid trunk and stem growth and promotes healthy green leaves;
- Phosphorous (P), which stimulates vigorous root growth;
- Potassium (K), which strengthen plants against disease and breakage.

A fertilizer should be selected on the basis of the percentages of these elements, rates of nutrient release, and plant requirements. Woody foliage plants benefit from higher proportions of nitrogen,

whereas plants grown for flowers and fruit benefit from higher percentages of phosphate. Unless there is a particular need for quick results, slow-release fertilizers are recommended.

Good fertilizers by tree type are as follows:

- Non-flowering Trees (both deciduous and evergreen): 10-6-4 (10% Nitrogen, 6% Phosphate, 4% Potash).
- Flowering Trees: 5-10-5. Nitrogen should be restricted to Crataegus and Malus to avoid the onset of fire blight.

**a. Application**

Fertilizer should be applied once a year in late winter or early spring at a rate of 2-3 pounds per inch of trunk diameter, measured at breast height. Apply fertilizer uniformly around the tree, three feet from the trunk to one foot beyond the drip line, at a depth of 10-18 inches and 30 inches on center. It is important, however, to refer to specific instructions listed by the manufacturer.

The methods of application may be as follows:

- Deep-root liquid injections;
- Slow-release tree fertilizer spikes;
- Drilled granular feed;
- Liquid-concentrate mixed with irrigation water through injection.

See Chapter Eight - Checklists for information on timing of fertilizer applications.

## **SECTION I PLANT-PROBLEM DIAGNOSIS**

The following table provides a list of common plant problems and symptoms and their associated probable causes.

### **Plant Problems and Probable Causes**

<b>Location on Plant</b>	<b>Problem/Symptom</b>	<b>Probable Cause(s)</b>
<b>Growth Habit</b>	Poor growth	Root rot Nematodes Air pollution
	Poor spacing of new growth	Shade Limited water Compacted soil Improper pruning Nematodes
	Bark abnormalities	Root rot Bark beetles Fungus Canker Gall Sun scald Winter scald Bacteria
	Substandard size	Nutrient deficiencies Soil compaction Root girdling Limited water and/or sun
	Growth abnormalities	Wind damage Salt damage Shade Canker Galls Nematodes
<b>Branches</b>	Abnormal formation	Insect infestation Bacteria Fungus Virus Road or walk salt Wind damage

<b>Location on Plant</b>	<b>Problem/Symptom</b>	<b>Probable Cause(s)</b>
<b>Branches (cont'd)</b>	Twig death	Borers (by-product is sawdust) Sapsucking insects/mites (Honeydew, sooty mold) Bacteria Fungus Virus Root girdling Blight Salt
	Branch death	Borers (by-product is sawdust) Sapsucking insects/mites (Honeydew, sooty mold) Bacteria Fungus Virus Root girdling Blight Salt
<b>Leaves</b>	Yellowing	Iron chlorosis Nutrient deficiencies Excessive sun Virus Nematodes Spring frost Poor drainage
	Browning	Leaf scorch Air pollution Fungus leaf miner Mites Excessive water (too little water), salt
	Wilt	Virus Bacterial wilt Excessive/Insufficient water Frost Wind Sun
	Early/Abnormal leaf drop	Sudden root damage Excessive water Nematodes

<b>Location on Plant</b>	<b>Problem/Symptom</b>	<b>Probable Cause(s)</b>
<b>Leaves (cont'd)</b>	Substandard size	Lack of water Nutrient deficiencies Soil compaction
	Leaf damage	Sapsucking insects/mites Air pollution
	Dead leaves	Air pollution Fungus Virus insects Root girdling Roots damaged or severed
	Leaf lesions	Fungus Sapsucking insects/mites
<b>Flowers</b>	Bud damage	Frost Insects Fungus
	Premature bud drop	Too little water
	No flowers	Young plants: too little sun

## **SECTION J TREE PROTECTION AND PRESERVATION**

Existing trees are natural and important resources and visual assets that should be carefully preserved and enhanced for functional as well as aesthetic uses. Natural areas of the site should be left essentially intact. In developed areas, disturbance of existing vegetation should be minimized. Root compaction caused by cars parking under trees is detrimental to a tree's health. Parking regulations should be strictly enforced under shade trees to prevent unnecessary tree loss.

## **SECTION K TREE REMOVAL**

### **1. IDENTIFYING TREES FOR REMOVAL**

Dying trees include all those which will not survive if left in their present condition and which cannot be saved by normal maintenance pruning or care. Identify for removal any tree with a 50 percent dead crown (branches), unless it is otherwise marked for preservation, and areas of dead, dying, or structurally dangerous standing trees. Cut trees as close to the ground as possible (no higher than five inches) without damaging adjacent trees or property.



## **2. STUMP-REMOVAL TECHNIQUES**

The method of stump-removal depends on the size of tree being removed. Small tree stumps may be removed by attaching a rope or chain to the tree stump and a trailer hitch or bar attached to a lawn tractor or vehicle. Be certain that both ends are attached securely. To make the removal easier, remove as much soil as possible from around the stump and roots. Tree stumps too large to be pulled out of the ground should be ground down with a stump grinder to two feet below finished grade. Eye protection is mandatory for such work.

## **3. REFILLING THE EXCAVATED STUMP PIT**

Stump pits are both unsightly and hazardous, and should therefore be filled level with the surrounding ground surface. The soil used for filling should be firmly compacted to minimize soil settling. If the pit is located in a lawn, it should be seeded or sodded with a grass type that matches the existing turf.

## **SECTION L CLEANUP**

### **1. MATERIALS TO BE REMOVED/DISPOSED**

Cleanup is important for public safety, area-wide appearance, and plant health. It includes the removal of leaves, clippings, and any other debris. Cleanup should be done routinely as the final part of every task and, in its own right, as the season dictates. Excess materials and waste should be removed daily as part of routine maintenance. When planting has been completed, clean the area of all debris, spoil piles, and containers. Where grass areas have been damaged or scarred during planting or maintenance operations, restore them to their original condition. Maintain at least one clear paved pedestrian access route to each building at all times during such work. Clean other paving when work in adjacent areas is completed.

### **2. CLEANUP ACTIVITIES**

Cleanup activities might include the following:

- Hand or mechanical pickups for removing heavier items from any location;
- Machine blowing for removing dry leaves and light items from curbs, gutters, lawns, and planting beds;
- Raking to remove wet or matted leaves.

### **3. CLEANUP GUIDELINES**

On any job, allow enough time before quitting to clean up the job site properly and to put away all tools and equipment. If a job is not completed before the end of the work day, allow enough time to make the job site neat and safe. Do not plan work that cannot be completed before a weekend. Conduct a quick tour of the entire work area late Friday afternoon to make sure everything is neat, clean, and secure for the weekend.

### **4. LEAF REMOVAL**

Leaf removal is a critical weekly or bi-weekly cleanup task from September through December. Walks and steps become safety hazards if leaves are allowed to remain. In general, machine blowing is the most efficient leaf-removal method if leaves are not wet and matted. Otherwise, hand leaf removal, including raking, is used.

## **SECTION M SCHEDULE**

See Chapter Nine - Schedule for schedule information.

**END OF CHAPTER TWO**