



City of Avondale

Street Tree Master Plan

Maintenance Guide

Introduction

This document was created to assist local businesses and other community members in their ongoing maintenance of trees and/or shrubs in the City of Avondale. The following information was taken from Avondale's Street Tree Master Plan. The entire Street Tree Master Plan can be accessed by following this link:

<http://avondalez6.visioninternet.net/home/showdocument?id=422>

Maintenance Guidelines

Maintenance of the public urban forest is the responsibility of the City of Avondale. Pruning of trees is the primary maintenance practice. This section contains landscaping maintenance standards of acceptable tree pruning maintenance, safety consideration, and irrigation systems. Properly designed, installed, and maintained streetscaping adds identity, character, beauty and value to our community.

The Street Tree Master Plan pruning standards reflect acceptable best management practices for pruning as published in the “American National Standards Institute (ANSI) A300 Pruning Standards” and “International Society of Arboriculture (ISA) Best Management Practices: Tree Pruning.” In some cases, the City of Avondale are more restrictive than those in the publications above, given the City’s goals of optimizing and enhancing the urban forest.

The main reasons for pruning trees are safety, health, and aesthetics.

- Pruning can encourage trees to develop a strong structure and reduce the likelihood of damage during severe weather.
- Pruning for safety involves removing branches that could fall and cause injury or property damage, trimming branches that interfere with lines of sight on streets or driveways, and removing branches that grow into utility lines.
- Pruning for health involves removing diseased or insect infested wood, thinning the crown to increase airflow and reduce some pest problems, and removing crossing and rubbing branches.
- Pruning for aesthetics involves enhancing the natural form and character of trees or stimulating flower production.



Health



Safety



Aesthetics

FIGURE 1: REASONS TO PRUNE

I. TREE MAINTENANCE SCHEDULE

Maintenance of the streetscape is the responsibility of the City of Avondale Public Works Department or the adjacent land owner. All trees shall be checked routinely for replacement or removal of unnecessary stakes and hose buffers. Nursery stakes, such as bamboo, shall be removed when the tree is planted and staked per City specifications. Contractor shall replace, at his/her cost, trees that are damaged by girdling caused by improper staking or hose buffer adjustments. All pruning shall conform to ANSI A300 Part 1 Pruning Standards.

When to prune:

- Deciduous trees should be pruned during their dormancy period, usually in the winter. Pruning during dormancy will promote a healthy spring growth.
- Spring flowering and desert trees should be pruned in May.
- Pruning Desert Trees: The pruning of desert trees shall occur as necessary but at least partial pruning twice a year to enhance a natural desert look and to keep branches from interfering with pedestrian, vehicle and bicycle traffic. Pruning that creates a pom, ball, or umbrella look, or lion tailing is prohibited. A 'partial prune' shall be required when specific limbs need to be removed, or to eliminate specific concerns. Partial pruning shall include, but not limited to: crown reductions, crown raising, eliminating visibility obstructions, and eliminating walkway obstructions.
- Never use pruning sealants, which can cause bacteria and fungus to seal in and degrade the health of the tree.
- Trees should be sparingly pruned during the summer months to prevent sunburn to trunks and other newly exposed areas.
- Cracked branches or hazardous conditions are prioritized for immediate maintenance. Low branches over street or sidewalk are to be maintained within one week of notice. All other inquiries for maintenance of non-safety related issues shall be completed within one month of notice.

II. TREE PRUNING SPECIFICATIONS

Pruning should only be done with a specific objective. It is the responsibility of the person conducting the work to be familiar with each type of pruning, its benefits, and its limitations. All pruning is to be supervised by a Certified Arborist as accredited by the ISA.

To meet the objective(s) identified for a tree, one or more of the following types of pruning may be permitted: crown cleaning, crown raising, reducing, thinning, crown reduction, weight reduction, crown restoration and young tree training. Each of these pruning types is described in further detail in ANSI A300 Standards and Best Management Practices: Tree Pruning.

How much to prune:

- No more than 25% of the trees mass should be removed during the year. Pruned trees will require more water and fertilizer due to the foliage loss, which would normally have produced plant energy.
- Topping, "poodling", lion tailing, balling, or squaring of trees is not allowed.
- All trees shall be pruned to promote structural strength and to accentuate the natural form and features of the tree.
- All trees shall be allowed to grow to their natural genetic form and size.
- Pruning shall be carried out to permit unobstructed passage to pedestrians and motor vehicles and to prevent sight restrictions near intersections. This means that branches should be maintained to a
- 8 ft. above sidewalks and 13 ft. above vehicular areas.
- Stripping of lower branches ("rising up") shall not be permitted. Lower branches shall be retained in a "tipped back" or pinched condition with as much foliage as possible to promote trunk caliper growth. Lower branches shall be cut off only after the tree is able to stand erect without staking or other support.
- Thinning of certain species and individual specimens may be required to prevent wind damage.
- Suckers, water sprouts, crossing and heavily laden branches shall be removed to provide less wind resistance

Young tree pruning:

Young trees should be pruned to develop good structure, including a strong and well established central leader, strong branch attachments, and adequate spacing and distribution of scaffold branches. Young tree pruning will need to occur on an ongoing basis over the first ten years after tree planting.

When pruning young trees- those three to four years old – the goal is to establish strong girth or width in a single-trunk tree. The stronger the trunk, the more apt it will be able to grow without stakes. Multi-trunk specimens, the goal is to develop three to four strong leaders.

- Leave lower branches on young trees for first three years after planting. They help nourish the trunk to make it stronger. It's acceptable to reduce branch length if clearance is needed.
- Avoid heading, also called topping. It will create a less-attractive structure and shortens life of the tree.
- Remove branches when angles are too narrow or too wide. These are weak and tend to split or break easily.

III. TYPES OF PRUNING AND WHERE TO CUT

- **Crown Cleaning:** Cleaning shall consist of pruning to remove one or more of the following non- beneficial parts: dead, diseased, and/or broken branches; also can be removal of water sprouts, crowded, weakly attached and low vigor branches from a tree's crown.

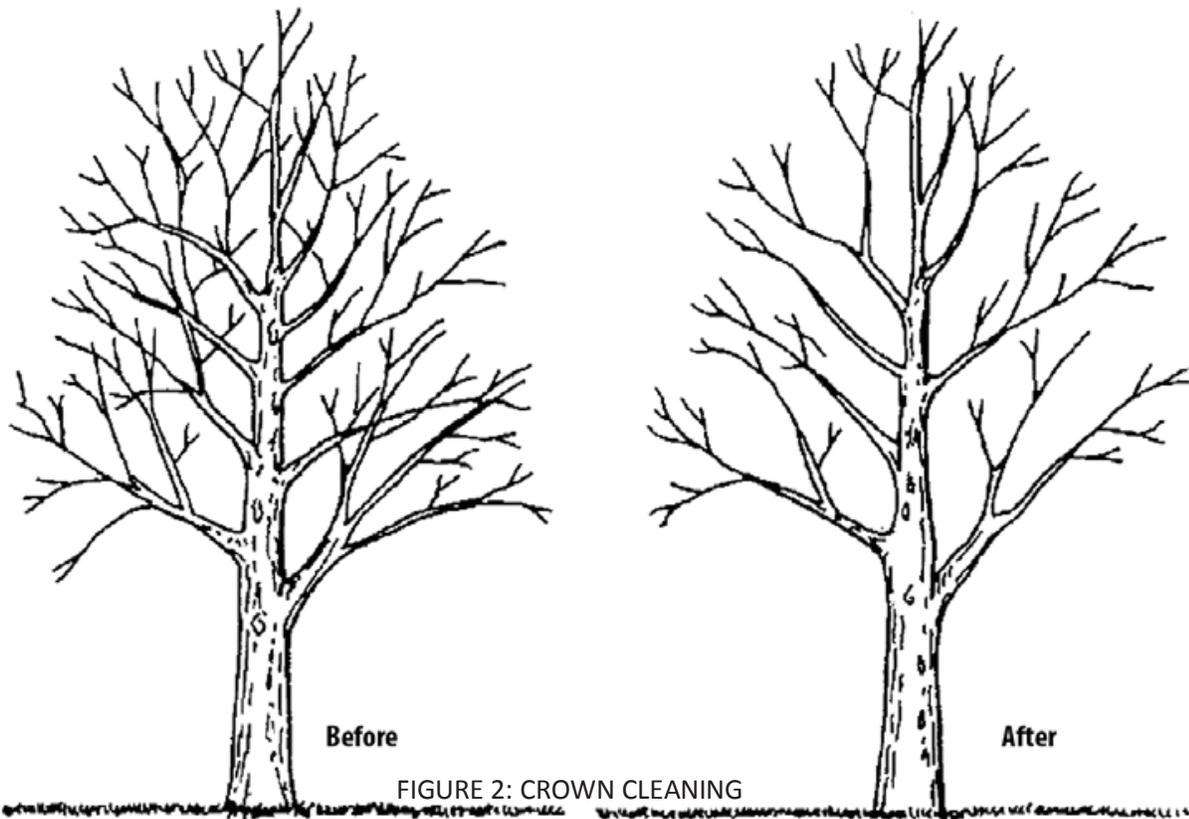


FIGURE 2: CROWN CLEANING

- **Crown Raising:** Raising shall consist of pruning to provide vertical clearance by removing the lower branches of a tree in order to provide clearance for vehicles, pedestrians, signage, and buildings. The city requires maintaining clearance standards 7 1/2 feet above the sidewalk. Consideration shall be given to the ability of a species to tolerate this type of pruning.

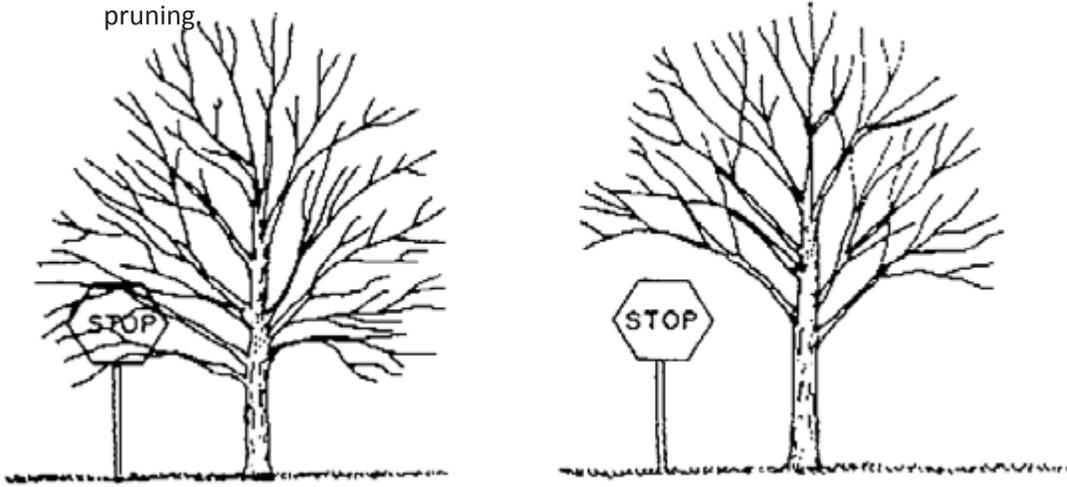


FIGURE 3: CROWN RAISING FOR SIGN CLEARANCE



FIGURE 4: CROWN RAISING SHALL RETAIN 67 PERCENT CROWN AND PRUNE 33 PERCENT

- **Reduce:** Reducing shall consist of pruning to decrease height for vertical conflicts and/or spread for adjacent conflicts such as buildings, walls, or bus shelters. Trees growing under electrical lines are cut back to the required distance as determined by the utility company.

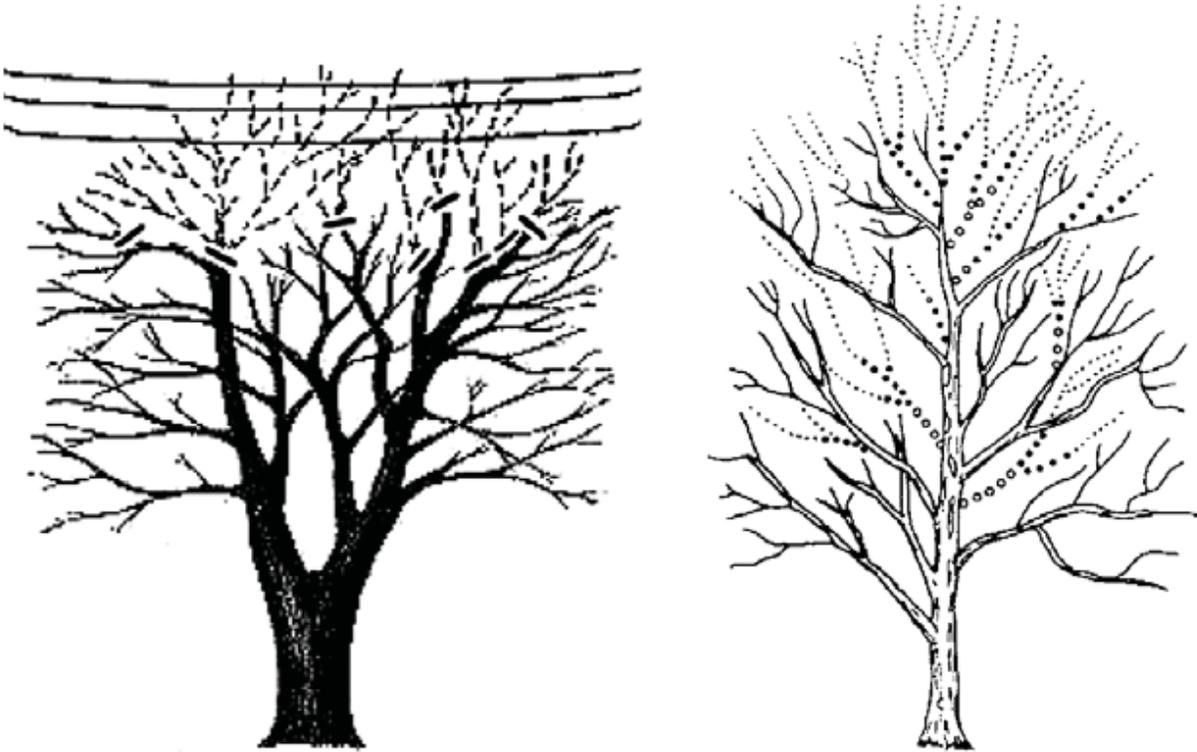


FIGURE 5: CROWN REDUCTION PRUNING UNDER UTILITY LINES (LEFT) OR REDUCTION IN SPREAD (RIGHT)

- **Crown Thinning:** Thinning shall consist of selective pruning to reduce density of live branches. Thinning should result in an even distribution of branches on individual branches and throughout the crown. A properly thinned tree should look natural, balanced, and healthy. Almost like no work has been done at all.

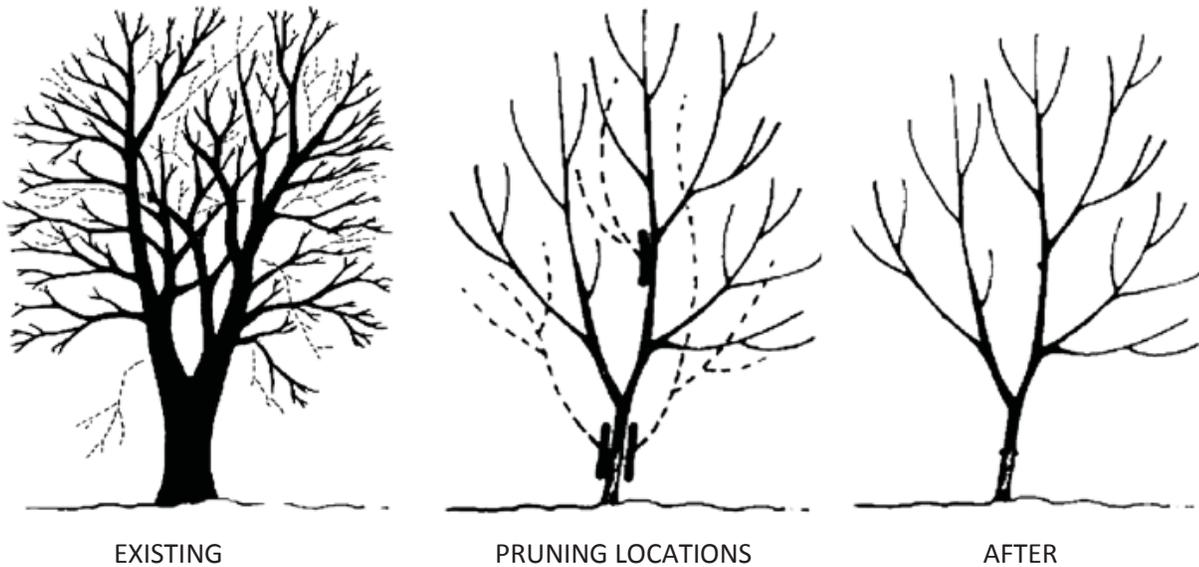


FIGURE 6: EXAMPLE STAGES OF PROPER CROWN THINNING

- **Crown Reduction:** Crown reduction is the cutting of limbs back to their point of origin or back to a lateral branch capable of sustaining the remaining limb and assuming apical dominance of the limb. Crown reduction is not the same as topping.
- **Weight reduction:** In order to reduce the likelihood of limb or trunk failure, proper pruning cuts at the end of limbs are used to reduce the weight of a limb.

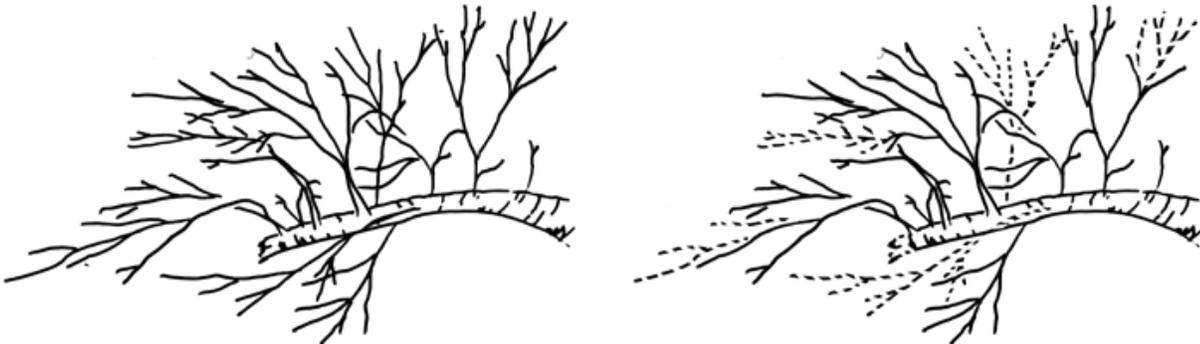


FIGURE 7: EXISTING (LEFT) AND PREFERRED REDUCTION PRUNING (RIGHT)

- **Restoration:** Crown restoration pruning is performed to improve the structure, form, and appearance of trees that have been topped, vandalized, or storm damaged. The success of restoration pruning depends on the ability of the tree to compartmentalize decay, extent and location of damage and the skill of the arborist attempting restoration. Restoring a tree to a sustainable structure usually requires a number of pruning's over a period of years. Not all trees that have been damaged are candidates for crown restoration and **a professional tree care specialist or certified arborist should be consulted to evaluate the tree**. It may not be possible to restructure the tree and removal and replacement may be a more viable solution.
- **Palm Pruning:** Palm trees shall be trimmed annually, May 15 through June 15, when the flower stalks have developed, but before flowering has occurred. Do not remove green leaves or prune up beyond the horizontal since this leads to bud damage, disease, or “pencil pointing” of the trunks. Palms should not look like carrots.
 - Palm pruning should be performed when fronds, fruit, or loose petioles may create a dangerous condition.
 - Live, healthy fronds above horizontal shall not be removed. Exception: Palms encroaching on electric supply lines.
 - Removing all live healthy fronds below a 45 degree angle from horizontal is not an acceptable pruning practice.

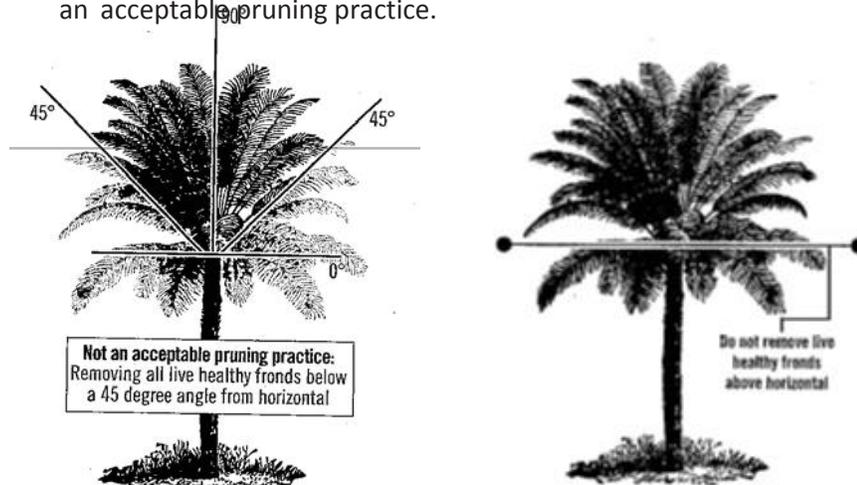


FIGURE 8: NOT ACCEPTABLE (LEFT) AND ACCEPTABLE (RIGHT) PALM PRUNING PRACTICE

III. PRUNING CUTS

Pruning cuts shall utilize the proper tools. Keeping tools well cleaned and sharpened will improve tree pruning. Tools shall also be cleaned between tree to tree pruning.

- Pruning tools shall be sharp and appropriately sized for the pruning cut.
 - Pruning shears shall be used for cuts up to ¾ inch diameter.
 - Lopping shears include long handles and can cut up to 1 ½ inch diameter branches.
 - Hand saws can be utilized for cutting branches up to 4 inches in diameter.
- Equipment that will damage the bark and cambium layer shall not be used on or in any tree. No chain saws or gas powered or electric trimming devices shall be used.
- Spikes or climbing spurs shall not be used for climbing trees during pruning operations.
- Bypass blades cross each other like those in scissors
- Pruning saws usually have curved blades with teeth that cut when you pull. Pruning saws allow for extended reach with a long handle, but they must be used carefully as it is difficult to achieve clean cuts
- Anvil type pruners are not acceptable.

Pruning cuts shall be in accordance with ANSI A300 pruning standard, and work shall be performed in accordance with the ANSI Z133.1 safety standard. Pruning shall be in accordance with ISA's *Best Management Practices: Tree Pruning*. All work shall be performed under the supervision of an ISA Certified Arborist.

Use the following guide for size of branches to be removed:

1. Under two inches in diameter – go ahead,
2. Between two and four inches in diameter – think twice, and
3. Greater than four inches in diameter – have a good reason.

Three Step Pruning Cut

The three-cut approach to pruning shall be used to prevent tearing of the bark and vascular tissue.

- Cut one-third of the way through the branch on the underside.
- Go 2-4 inches beyond the undercut to remove the branch.
- Make the final cut just outside the branch bark ridge and trunk collar.

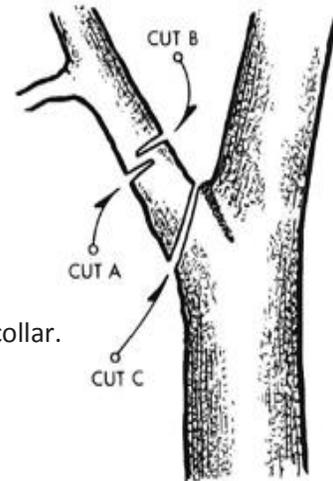
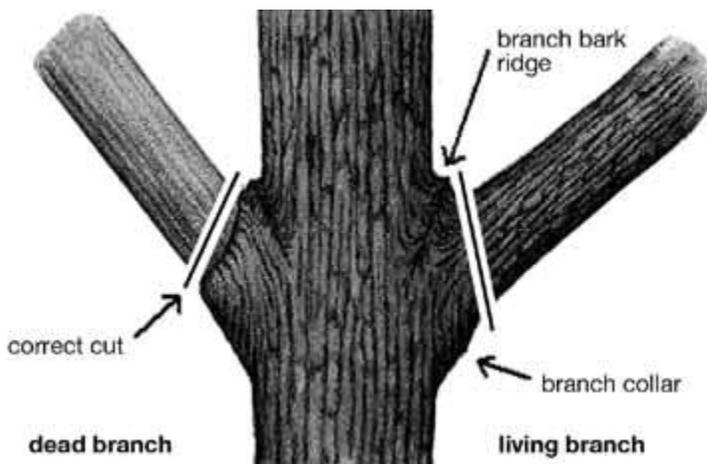
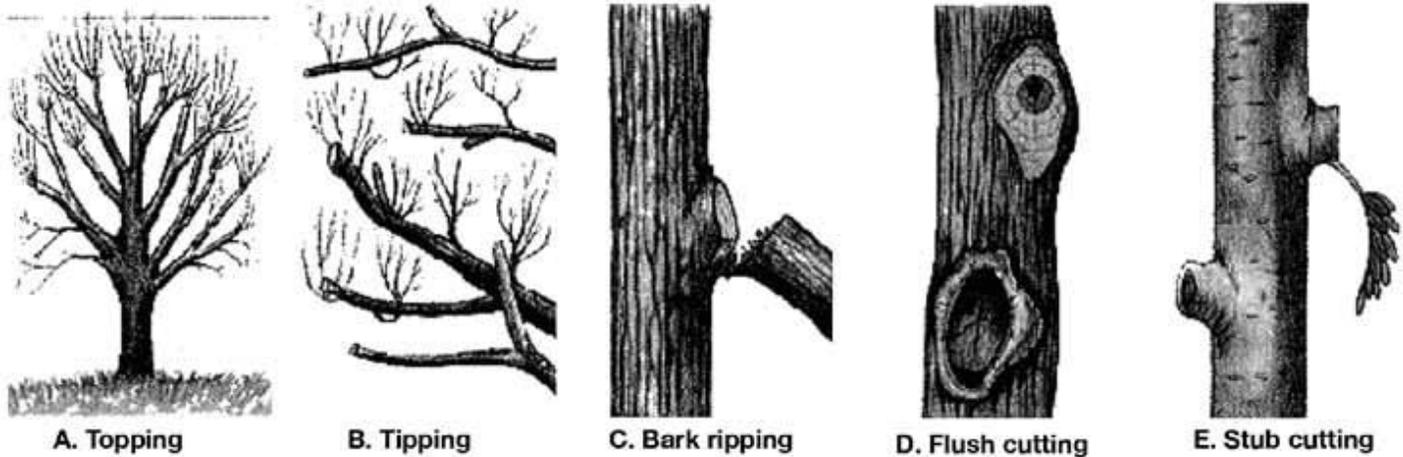


FIGURE 9: EXAMPLE OF 3-STEP PRUNING CUT



PRACTICES THAT HARM TREES



Topping, poedling, balling, squaring, and tipping are pruning practices that harm trees is not allowed. Topping is the pruning of large upright branches between **nodes** and is often done to reduce the height of a tree. Tipping is a practice of cutting lateral branches between nodes to reduce crown width or branch length. These practices result in the development of epicormic sprouts or in the death of the cut branch back to the next lateral branch below. These epicormic sprouts are weakly attached to the stem and eventually will be supported by a decaying branch. Internodal pruning and leaving branch stubs are not permitted.



FIGURE 10: EXAMPLE OF TIPPING



FIGURE 11: EXAMPLE OF TOPPING

Improper pruning cuts cause unnecessary injury and bark ripping. Flush cuts can injure stem tissues and can result in decay. Stub cuts delay wound closure and can provide entry to canker fungi that kill the **cambium**, delaying or preventing wound-wood formation. It is important that the safety of the tree be evaluated by a professional arborist before any pruning is attempted on a tree. There may be structural defects that will endanger property and the people who use the area as well as the worker who attempts to prune the tree.

- Flush cuts are not permitted.
- Lions tailing is not permitted. Lions tailing is the improper practice of removing all or most secondary and tertiary branches from the interior portion of the crown, leaving most live foliage at the edge of the canopy.

AMOUNT OF PRUNING

No more than 25% of the crown shall be removed within an annual growing season.



FIGURE 12: EXAMPLE OVER-PRUNING: NO MORE THAN 25% OF CROWN SHALL BE REMOVED

IV. FERTILIZATION

- Fertilizing if needed, shall be performed to the ANSI A300 (Part2),-2004, Fertilization Standards and the companion BMP publication.
- Trees from desert regions: unnecessary to add fertilizer to the backfill nor ongoing.
- Non -native trees shall be fertilized annually, in the spring, with a complete fertilizer. Fertilization of mature trees shall be required only if the tree show a definite need for fertilization.
- Apply nitrogen fertilizer ONLY if diagnosis by an arborist indicates that is necessary. Fertilizer shall be applied around the tree, approximately halfway between the trunk and the dripline, at the rate of one-half pound of nitrogen per inch of trunk diameter measured at four feet above the soil surface.
- All trees shall be observed for signs of nutrient deficiencies and treated to correct deficiencies throughout the year.

V. WATERING

The watering of existing and new trees shall follow these landscape guidelines. Periods of extreme heat, wind or drought may require additional application of water beyond the amounts recommended in these specifications. The method and amount that is applied may vary depending upon soil composition, heat, wind, nearby competition such as turf or ground cover, periods of abnormal rainfall or in poorly drained soils. Trees shall be checked monthly to ensure they are receiving the proper amount of water and more often during the summer months.

All woody plants respond best to long, deep soaks that wet the entire root zone, and there should be enough time between the soaks for the soil to dry out slightly.

Conduct a soil moisture test within 30 minutes after watering to check moisture depth. Insert a metal rod or similar instrument into the soil near the drip line of the plant. This will indicate if watering schedule; frequency is adequate or needs adjustment. It is best to water long and deep rather than shallow watering for short intervals.

Water requirements should be calculated based upon tree size, tree type, weather and microclimates. In the low desert, the irrigation schedule guidelines from the Arizona Municipal Water Users Association shall be followed whenever possible.

Landscape Watering Guidelines

How Much & How Often		Seasonal Frequency – Days Between Waterings				Water This Deeply
		Spring Mar – May	Summer May – Oct.	Fall Oct. – Dec.	Winter Dec. – Mar.	
Trees	Desert Adapted	14 – 30 days	7 – 21 days	14 – 30 days	30 - 60 days	24 – 36 inches
	High Water Use	7 – 12 days	7 - 10 days	7 - 12 days	14 - 30 days	24 – 36 inches
Shrubs	Desert Adapted	14 - 30 days	7 - 21 days	14 - 30 days	30 - 45 days	18 - 24 inches
	High Water Use	7 – 10 days	5 – 7 days	7 – 10 days	10 - 14 days	18 – 24 inches
Groundcovers & Vines	Desert Adapted	14 - 30 days	7 -21 days	14 - 30 days	21 - 45 days	8 – 12 inches
	High Water Use	7 – 10 days	2 – 5 days	7 – 10 days	10 - 14 days	8 – 12 inches
Cacti & Succulents		21 - 45 days	14 - 30 days	21 - 45 days	If needed	8 – 12 inches
Annuals		3 – 7 days	2 – 5 days	3 – 7 days	5 –10 days	8 – 12 inches
Warm Season Grass (Bermuda, etc.)		4 – 14 days	3 – 6 days	6 - 21 days	15 - 30 days	6 – 10 inches
Cool Season Grass (Rye, Fescue)		3 – 7 days	None	3 – 10 days	7 – 14 days	6 – 10 inches

These guidelines are for established plants (1 year for shrubs, 3 years for trees). Additional water is needed for new plantings or unusually hot or dry weather. Less water is needed during cool or rainy weather.

Drip run times are typically 2 hours or more for each watering

Refer to Arizona Municipal Water Users Association’s Guidelines for Landscape Drip Irrigation Systems for Estimate Requirements for Phoenix, Arizona. www.amwua.org and the “Landscape Watering by the Numbers Guide.”

Resources

ANSI A300 (Part 1)-2008 Pruning: Tree, Shrub, and Other Woody Plant Maintenance – Standard Practices Pruning (Revision of ANSI 300 (Part 1)- 2001. American National Standards Institute, Washington D.C.

ANSI A300 (Part 2) -2011 Soil Management – a. Modification b. Fertilization, and c. Drainage (Revision of ANSI A300 (Part 2)-2004 Fertilization. American National Standards Institute, Washington D.C.

ANSI Z133.1 -2006. Standards for Arboricultural Operations: Safety Requirements. American National Standards Institute, Washington, D.C.

Best Management Practices: Tree Pruning.2002. Gilman, E. and S. Lilly. International Society of Arboriculture. Champion, Ill.

Shigo, A. 1991. Modern arboriculture. Durham, NH: Shigo & Trees, Associates.

Shigo, A. 1989. Tree pruning: a worldwide photo guide. Durham, NH: Shigo & Trees, Associates.
Trees are good, © 2007 International Society of Arboriculture