A GUIDE FOR TREE, PALM MAINTENANCE FOR URBAN ROADSIDES AND LANDSCAPE AREAS

Prepared by

FDOT

Office of Maintenance

2015 Edition

ACKNOWLEDGMENTS

The Office of Maintenance, Florida Department of Transportation, with the assistance and cooperation of representatives from Central Office, District Offices, Consultant Representatives, Landscape Architects, Ground Crews, Maintenance Offices and information documents from the following:

- United States Department of Agriculture Forest Service Northeastern Area State "How to Prune Trees".
- The University of Florida / IFAS Extension Dr. Gary W. Knox and Dr. Edward F. Gilman.
- The University of Florida / IFAS Extension Dr. Timothy K. Broschat and Dr. Monica L. Elliott

were instrumental in the development of this handbook. The standard criteria provided within this handbook is for guidance in the uniform and routine maintenance of trees and landscape areas.

TABLE OF CONTENTS

INTRODUCTION

This guide should be used as minimum requirements to assist in the development and improvement of District Vegetation Management Plans as required by the Roadway and Roadside Procedure #850-000-015.

Implementing a comprehensive tree, palm, and landscape management program can significantly improve the health and aesthetic value of vegetation along state roadways, and reduce the overall cost for replacement or removal of trees and plants. This guide provides methods for efficiently and effectively managing the activities that will achieve and maintain a high level of health for tree, palm and landscape areas.

The information in this guide is presented in four sections:

Section 1: Landscape: Defined as those areas that have been changed by the placing of trees, flowers or plants that require maintenance such as weeding, mulching, trimming, pruning, replacing, fertilizing, insect control, or edging.

Section 2: Bold Landscape Areas: Defined as areas or individual locations of large or mature specialized trees and palms which could also include any and all ornamental plants included in these landscape areas. The methods for successful establishment and cultural practices necessary for maintaining plants at a desired level of quality, that require maintenance such as weeding, mulching, trimming, pruning, replacing, fertilizing, insect spraying or edging.

Section 3: Urban Tree, and Palm Pruning: Defined as the proper crown thinning, raising, and reduction and/or pruning cuts of trees, limbs, braches, or fronds of palms or encroaching limbs within the right of way of the state road system.

Section 4: Specialized Tree Pruning Requirements: Defined as maintenance requirements for the pruning of specialized trees within the state right of way, and in bold landscape areas.

SECTION 1: TRADITIONAL ROADSIDE LANDSCAPE AREAS

GENERAL

What is referred to as traditional roadside landscape areas, are designated landscaping projects found on urban and rural roadsides, medians, and sometimes in utility strip areas behind curb and gutter. These projects are sometimes installed during construction through agreements with local governments, and permits with abutting private property owners or through the Florida Highway Beautification Council Grant, or District landscape funding processes. In some cases these projects may have a memorandum of agreement (MOA), or joint participation agreement (JPA) by a local agency with the Department.

MRP CRITERIA FOR RATING LANDSCAPE AREAS:

All landscape areas will be rated by the Maintenance Rating Program (MRP) using the following criteria:

LANDSCAPING: 90% of landscape vegetation is maintained in a healthy, attractive condition.

NOTE: Rate all landscaping in the sample point located within the limits of the right of way.

Landscaping is defined as those areas that have been changed by the installation of trees, palms, shrubs, or ground covering plants located in beds or in tree rings that will require weeding, mulching, edging, insect spraying, and fertilizing as well as pruning, and replacement of subject dead or dying plant material.

Evaluation: Inspect the landscaped areas. Determine if the plants are being maintained in a healthy attractive condition. Landscaped areas that appear unhealthy or unattractive due to apparent lack of maintenance (presence of weeds, dead or dying plants or overgrown appearance) cause this characteristic not to meet the desired maintenance condition. For MRP purposes, the presence of weeds in more than 10% of the landscaped area is considered undesirable. ***Landscaping does not meet MRP standards when any of the following exist:***

1) If more than 10% of the landscaping areas appear unhealthy or unattractive due to the apparent lack of maintenance (presence of weeds, dead or dying plants or overgrown appearance).
2) Any landscaping is within the limits of the clear sight window as per Design Standard Index 546.

SPECIAL REQUIRMENTS

Each Department District Maintenance Office, Department Field Office, Asset Maintenance Contractor, and/or Local Maintaining Agency should develop a detailed maintenance plan for best management practices of trees and plants and document electronically or in writing the following information on each landscape project owned by the Department:

- Location of the site, GPS, or state road number, roadway section, mile post, and where located (median, north side…)
- An inventory of plants to include the type or species, total number of each species, the size and grade of plants.
- Type, depth and color of mulch being used (if mulch is required) (The use of cypress mulch is prohibited).
- Irrigation and method with an estimated amount of water used.
- All fertilizers and/or nutrients used in the landscape area with the product, amount, and date applied.
- Documentation on all other maintenance activities, inspection dates, trimming, pruning, weeding, and any replacement of plants.
- Rate the overall condition of the plants.

Contact the local maintaining agency that has the memorandum of agreement (MOA), or joint participation agreement (JPA) for landscape areas that do not meet these conditions, for corrective action.

SPECIAL REQUIREMENTS

Each Department District Maintenance Office, Department Field Office, Asset Management Contractor, or Local Maintaining Agency should document electronically or in writing the following information on Wildflower Areas (WA's) in accordance with the Department's most current edition of the Wildflower and Natural Areas Program Procedure (Topic Number:650-030-001)

- Location of the WA, GPS, or state road number, roadway section, mile post, and where located (median, north side…)
- Size of the WA and types of wildflower(s), whether natural, or planted.

SECTION 2: BOLD LANDSCAPE AREAS

GENERAL

What is referred to as bold landscape areas, are designated landscaping projects found on urban and rural roadsides, medians, and interchanges. Those areas or general locations containing large… specialty (not specialized) trees and palms, which are sometimes installed through agreements with local agencies or permits with abutting private property owners, or through a Florida Highway Beautification Grant or District landscape reimbursement process. In some cases these The Department may have a memorandum of agreement (MOA) , or joint participation agreement (JPA) with a local government for these projects.

BOLD LANDSCAPE AREAS

Trees and palms in all landscape areas will be rated using the tree and palm trimming criteria in this document by the most current edition of the maintenance rating program (MRP) using the following tree trimming criteria below, and any flowers, plants, and mulch incorporated with these areas would be rated using landscaping criteria in the most current edition of the maintenance rating program (MRP) handbook in the above section.

MRP CRITERIA FOR RATING TREE TRIMMING IN BOLD LANDSCAPE AREAS

TREE TRIMMING: No encroachment of trees, tree limbs or vegetation in or over the travel way or clear zone lower than 14-1/2 feet or lower than 8-1/2 feet over sidewalks. No vegetation violates the horizontal clearance as defined by this standard.

Note: *For MRP purposes see the Design Standards for the tree trimming clear zone limits.*

Tree Trimming – This characteristic is the encroachment control of trees or tree limbs within the right-of-way.

Evaluation: All samples are to be evaluated for tree trimming.

Dead or dying trees within the right-of-way that could fall in the clear zone, across the right-of way fence, or present a hazard to vehicles, adjacent property owners or pedestrians does not meet desired conditions.

For MRP purposes, trees to be evaluated should have a diameter greater than 4 inches as measured 6 inches above the ground. Also evaluated for tree trimming, are tree limbs greater than 1 inch in diameter greater than 3 feet above the ground.

In areas with curb and gutter, there should be no vegetation over the roadway lower than 14-1/2 feet from the face of curb to the face of curb.

In areas without curb and gutter, there should be no tree or trees limbs over the roadway and shoulder lower than 14-1/2 feet.

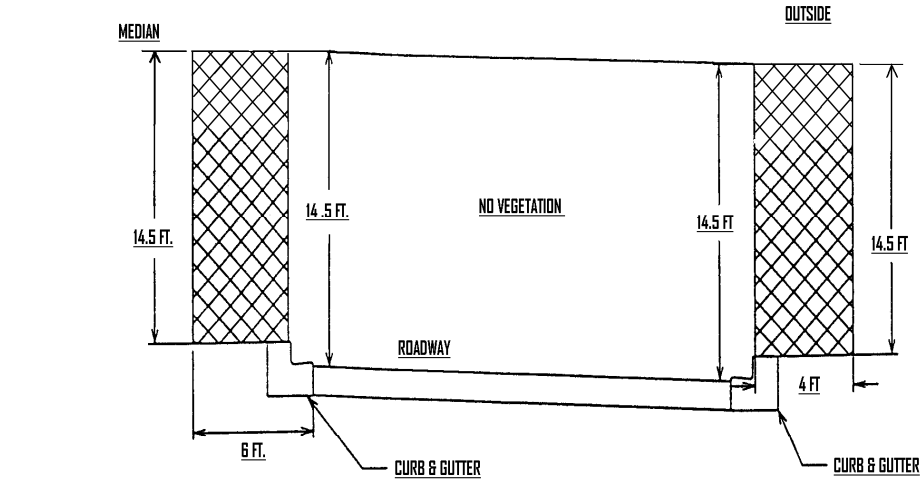
In cases where guardrail is present, there should be no vegetation over the roadway and shoulder lower than 14-1/2 feet from the face of guardrail.
In areas with sidewalk, there should be no encroachment of trees, tree limbs or vegetation over the sidewalk lower than 8-1/2 feet.

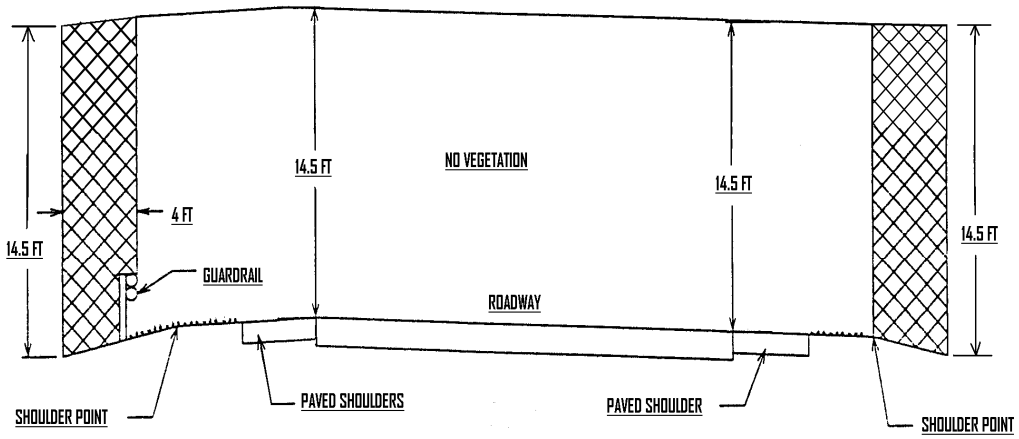
In an area with a bike path, there should be no encroachment of trees~~,~~ or tree limbs over the bike path lower than 8-1/2 feet.

Tree trimming does not meet MRP standards when any of the following exist:

1) In curb and gutter areas, vegetation is lower than 14-1/2 feet over the roadway from the face of curb to the face of curb.
2) In areas without curb and gutter, vegetation over the roadway and shoulder is lower than 14-1/2 feet.
3) In areas with guardrail, trees or tree limbs over the roadway and shoulder are lower than 14-1/2 feet from face of guardrail.
4) Vegetation encroachment of trees, tree limbs or vegetation over the sidewalk is lower than 8-1/2 feet.
5) Dead or dying trees within the right-of-way that could fall in the clear zone, across the right-of-way fence or present a hazard to vehicles, adjacent property owners or pedestrians.
6) Trees and/or vegetation that obscure the message of a sign.
7) Encroachment of trees, tree limbs or vegetation over a bike path lower than 8-1/2 feet.

CLEAR ZONE VEGETATION CRITERIA





VEGETATION VIOLATING HORIZONTAL CLEARANCE

Note: The cross hatched areas shown above represent areas to be evaluated for horizontal clear zone violations. Violation of clear zone includes the evaluation of trees that have a diameter greater than 4 inches as measured 6 inches above the ground. It also includes the evaluation of tree limbs greater than 1 inch in diameter greater than 3 feet above the ground.

SPECIAL REQUIREMENTS

Each Department District Maintenance Office, Department Field Office, Asset Maintenance Contractor, and/or Local Maintaining Agency should develop a detailed maintenance plan for best management practices of trees and plants and document electronically or in writing the following information on each bold landscape project owned by the Department.

- Location of the site, GPS, or state road number, roadway section, mile post, and where located (median, north side…)
- An inventory of all trees and any plants used, to include the type or species, total number of each species, the size and grade of all trees and plants used in the area. (The use of as-built plans may help to determine inventory and other specific project details).
- Type, amount, and color of mulch being used (if mulch is required). The use of cypress mulch is prohibited.
- Irrigation and method with an estimated amount of water used.
- All fertilizers and/or nutrients used in the landscape area for specialized trees and plants with the product, amount, and date applied.
- Documentation on all other maintenance activities, inspection dates, trimming, pruning, weeding, and any replacement of trees and/or plants.
- Develop a prescribed maintenance plan for best management practices for the health of these areas. The trees should be inspected on a routine bases and written documentation should be kept on file for all maintenance activity being performed.
- Rate the overall condition of each tree and/or plants.

Urban Tree Pruning

How To

Prune Trees

United States
Department of Agriculture
Forest Service Northeastern Area State and Private Forestry

Revised August 2012

How to
Prune Trees

Contents Page

Introduction

The objective of pruning is to produce strong, healthy, attractive plants. By understanding how, when and why to prune, and by following a few simple principles, this objective can be achieved.

Reasons For Pruning

The main reasons for pruning ornamental and shade trees include safety, health, and aesthetics. In addition, pruning can be used to stimulate fruit production and increase the value of timber. Pruning for *safety* (Fig. 1A) 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. Safety pruning can be largely avoided by carefully choosing species that will not grow beyond the space available to them, and have strength and form characteristics that are suited to the site.

Pruning for *health* (Fig. 1B) 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 can best be used to encourage trees to develop a strong structure and reduce the likelihood of damage during severe weather. Removing broken or damaged limbs encourages wound closure.

Diagram A: Safety / B: Health / C: Preservation

3 Pruning for *aesthetics* (Fig. 1C) involves enhancing the natural form and character of trees or stimulating flower production. Pruning for form can be especially important for open-grown trees that do very little self-pruning.

All woody plants shed branches in response to shading and competition. Branches that do not produce enough carbohydrates from photosynthesis to sustain themselves die and are eventually shed; the resulting wounds are sealed by **woundwood** (callus). Branches that are poorly attached may be broken off by wind and accumulation of snow and ice. Branches removed by such natural forces often result in large, ragged wounds that rarely seal. Pruning as a cultural practice can be used to supplement or replace these natural processes and increase the strength and longevity of plants.

Trees have many forms, but the most common types are pyramidal **(excurrent)** or spherical (**decurrent)**. Trees with pyramidal crowns, e.g., most conifers, have a strong central stem and lateral branches that are more or less horizontal and do not compete with the central stem for dominance. Trees with spherical crowns, e.g., most hardwoods, have many lateral branches that may compete for dominance.

To reduce the need for pruning it is best to consider a tree's natural form. It is very difficult to impose an unnatural form on a tree without a commitment to constant maintenance

Pollarding and **topiary** are extreme examples of pruning to create a desired, unnatural effect. Pollarding is the practice of pruning trees annually to remove all new growth. The following year, a profusion of new branches is produced at the ends of the branches. Topiary involves pruning trees and shrubs into geometric or animal shapes. Both pollarding and topiary are specialized applications that involve pruning to change the natural form of trees. As topiary demonstrates, given enough care and attention plants can be pruned into nearly any form. Yet just as proper pruning can enhance the form or character of plants, improper pruning can destroy it.

Pruning Approaches

Producing strong structure should be the emphasis when pruning young trees. As trees mature, the aim of pruning will shift to maintaining tree structure, form, health and appearance.

Proper pruning cuts are made at a node, the point at which one branch or twig attaches to another. In the spring of the year growth begins at buds, and twigs grow until a new node is formed. The length of a branch between nodes is called an internode.

The most common types of pruning are:

1. *Crown Thinning* (Fig. 2)

Crown thinning, primarily for hardwoods, is the selective removal of branches to increase light penetration and air movement throughout the crown of a tree. The intent is to maintain or develop a tree's structure and form. To avoid unnecessary stress and prevent excessive

production of epicormic sprouts, no more than one-quarter of the living crown should be removed at a time. If it is necessary to remove more, it should be done over successive years.

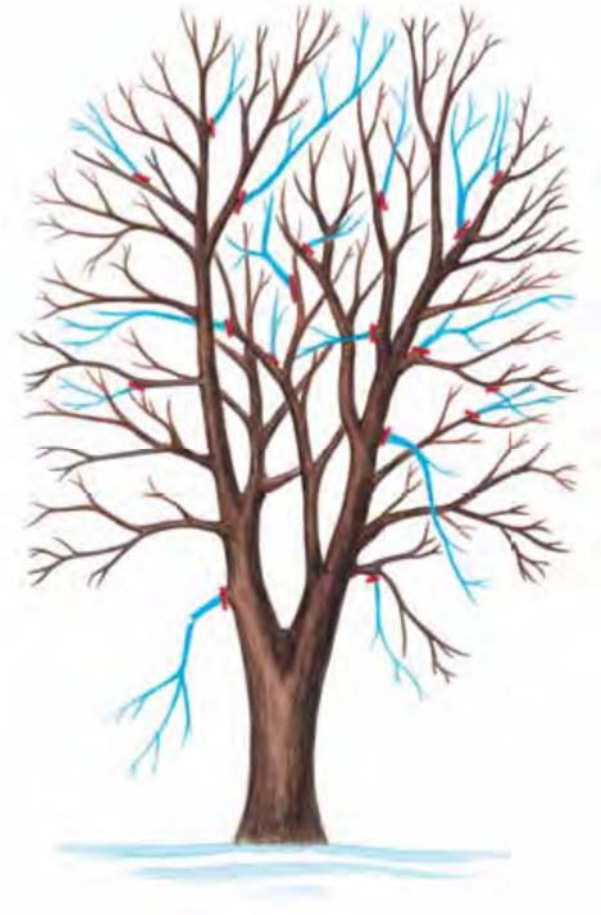
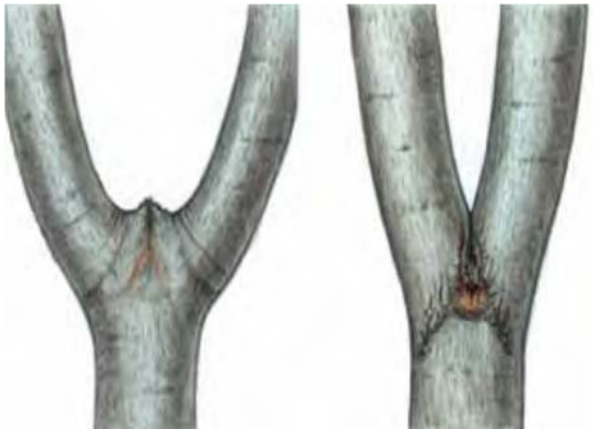


Figure 2. Crown thinning—branches to be removed are shaded in blue; pruning cuts should be made at the red lines. No more than one-fourth of the living branches should be removed at one time.



A. U-shaped strong union B. V-shaped weak union

Figure 3. Types of branch unions

Branches with strong U-shaped angles of attachment should be retained (Fig. 3A). Branches with narrow, V-shaped angles of attachment often form **included bark** and should be removed (Fig. 3B). Included bark forms when two branches grow at sharply acute angles to one another, producing a wedge of inward-rolled bark between them. Included bark prevents strong attachment of branches, often causing a crack at the point below where the branches meet. Codominant stems that are approximately the same size and arise from the same position often form included bark. Removing some of the lateral branches from a codominant stem can reduce its growth enough to allow the other stem to become dominant.

Lateral branches should be no more than one-half to three-quarters of the diameter of the stem at the point of attachment. Avoid producing "lion's tails," tufts of branches and foliage at the ends of branches, caused by removing all inner lateral branches and foliage. Lion's tails can result in sunscalding,

abundant **epicormic sprouts**, and weak branch structure and breakage. Branches that rub or cross another branch should be removed.

Conifers that have branches in whorls and pyramidal crowns rarely need crown thinning except to restore a dominant leader. Occasionally, the leader of a tree may be damaged and multiple branches may become codominant. Select the strongest leader and remove competing branches to prevent the development of codominant stems.

2. *Crown Raising* (Fig. 4)

Crown raising is the practice of removing branches from the bottom of the crown of a tree to provide clearance for pedestrians, vehicles, buildings, lines of site, or to develop a clear stem for timber production. Also, removing lower branches on white pines can prevent blister rust. For street trees the minimum clearance is often specified by municipal ordinance. After pruning, the ratio of the living crown to total tree height should be at least two-thirds (e.g., a 12 m tree should have living branches on at least the upper 8 m).

On young trees "temporary" branches may be retained along the stem to encourage taper and protect trees from vandalism and sunscald. Less vigorous shoots should be selected as temporary branches and should be about 10 to 15 cm apart along the stem. They should be pruned annually to slow their growth and should be removed eventually.

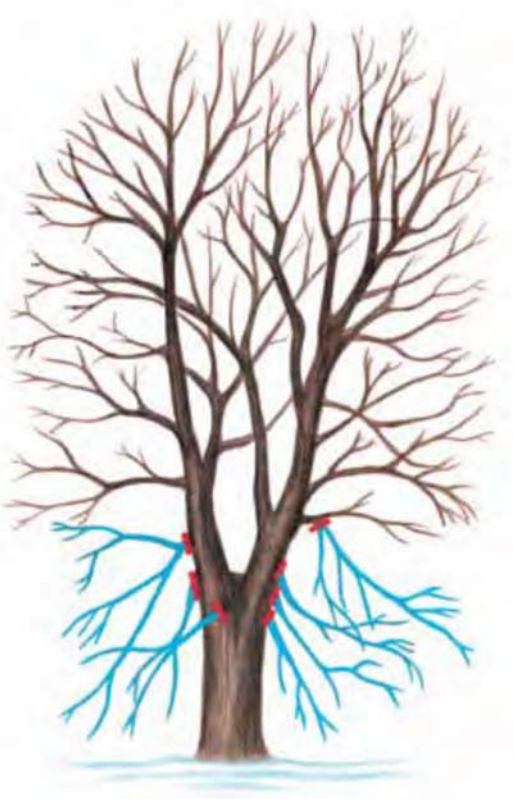


Figure 4. Crown raising—branches to be removed are shaded in blue; pruning cuts should be made where indicated with red lines. The ratio of live crown to total tree height should be at least two-thirds.

3. *Crown Reduction* (Fig. 5)

Crown reduction pruning is most often used when a tree has grown too large for its permitted space. This method, sometimes called **drop crotch pruning**, is preferred to topping because it results in a more natural appearance, increases the time before pruning is needed again, and minimizes stress (see drop crotch cuts in the next section).

Crown reduction pruning, a method of last resort, often results in large pruning wounds

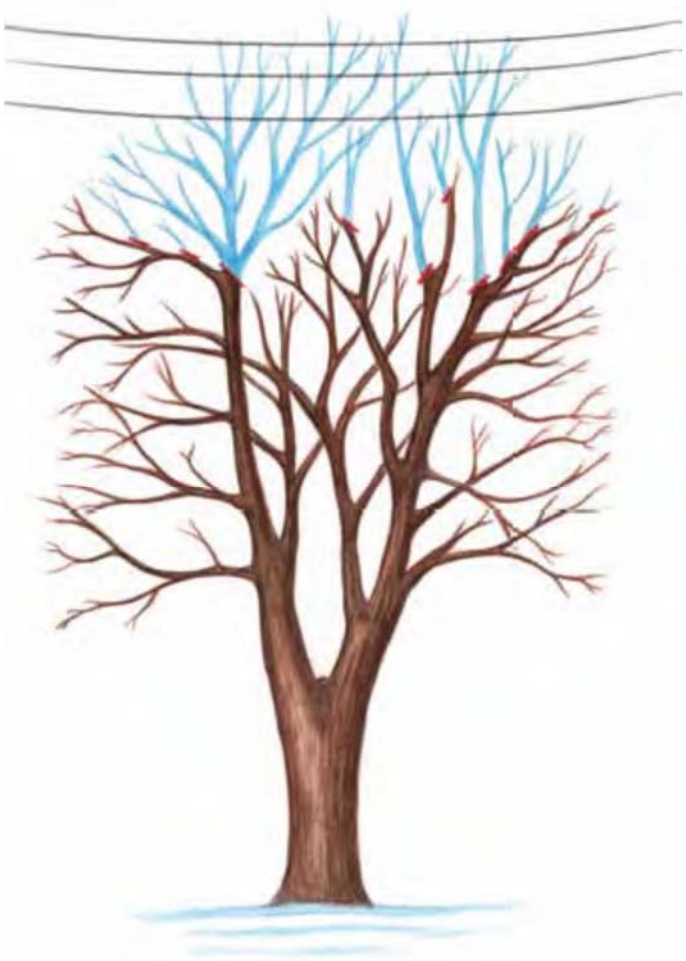


Figure 5. Crown reduction—branches to be removed are shaded in blue; pruning cuts should be made where indicated with red lines. To prevent branch dieback, cuts should be made at lateral branches that are at least one-third the diameter of the stem at their union.

to stems that may lead to decay. This method should never be used on a tree with a pyramidal growth form. A better long term solution is to remove the tree and replace it with a tree that will not grow beyond the available space.

Pruning Cuts

Pruning cuts should be made so that only branch tissue is removed and stem tissue is not damaged. At the point where the branch attaches to the stem, branch and stem tissues remain separate, but are contiguous. If only branch tissues are cut when pruning, the stem tissues of the tree will probably not become decayed, and the wound will seal more effectively.

1. *Pruning living branches* (Fig. 6)

To find the proper place to cut a branch, look for the **branch collar** that grows from the stem tissue at the underside of the base of the branch (Fig. 6A). On the upper surface, there is usually

a **branch bark ridge** that runs (more or less) parallel to the branch angle, along the stem of the tree. A proper pruning cut does not damage either the branch bark ridge or the branch collar.

A proper cut begins just outside the branch bark ridge and angles down away from the stem of the tree, avoiding injury to the branch collar (Fig. 6B). Make the cut as close as possible to the stem in the **branch axil**, but outside the branch bark ridge, so that stem tissue is not injured and the wound can seal in the shortest time possible. If the cut is too far from the stem, leaving a branch stub, the branch tissue usually dies and woundwood forms from the stem tissue. Wound closure is delayed because the woundwood must seal over the stub that was left.

Section 4: Specialized Palm and Crape Myrtle Tree Pruning Requirements:

GENERAL

Different types of palms will require different methods of pruning or trimming. The information below and other useful information was downloaded from this web site: http://edis.ifas.ufl.edu/topic_palm_care

A. PALM TREE PRUNING:

Pruning Palms[1]

Timothy K. Broschat[2]

Perhaps the most fundamental question to answer when discussing palm pruning is what should a healthy, properly pruned palm look like? Contrary to popular belief, the palm in Fig. 1 is not a properly pruned palm. It provides little shade, is unattractive, and will be weaker than a full-canopied palm like the one in Fig. 2. A properly fertilized and pruned palm like the one in Fig. 2 should have a round canopy with green leaves right down to the bottom. Consumers must be educated that palms are supposed to have round crowns, not feather-duster crowns.

Figure 1. An overpruned sable palm.

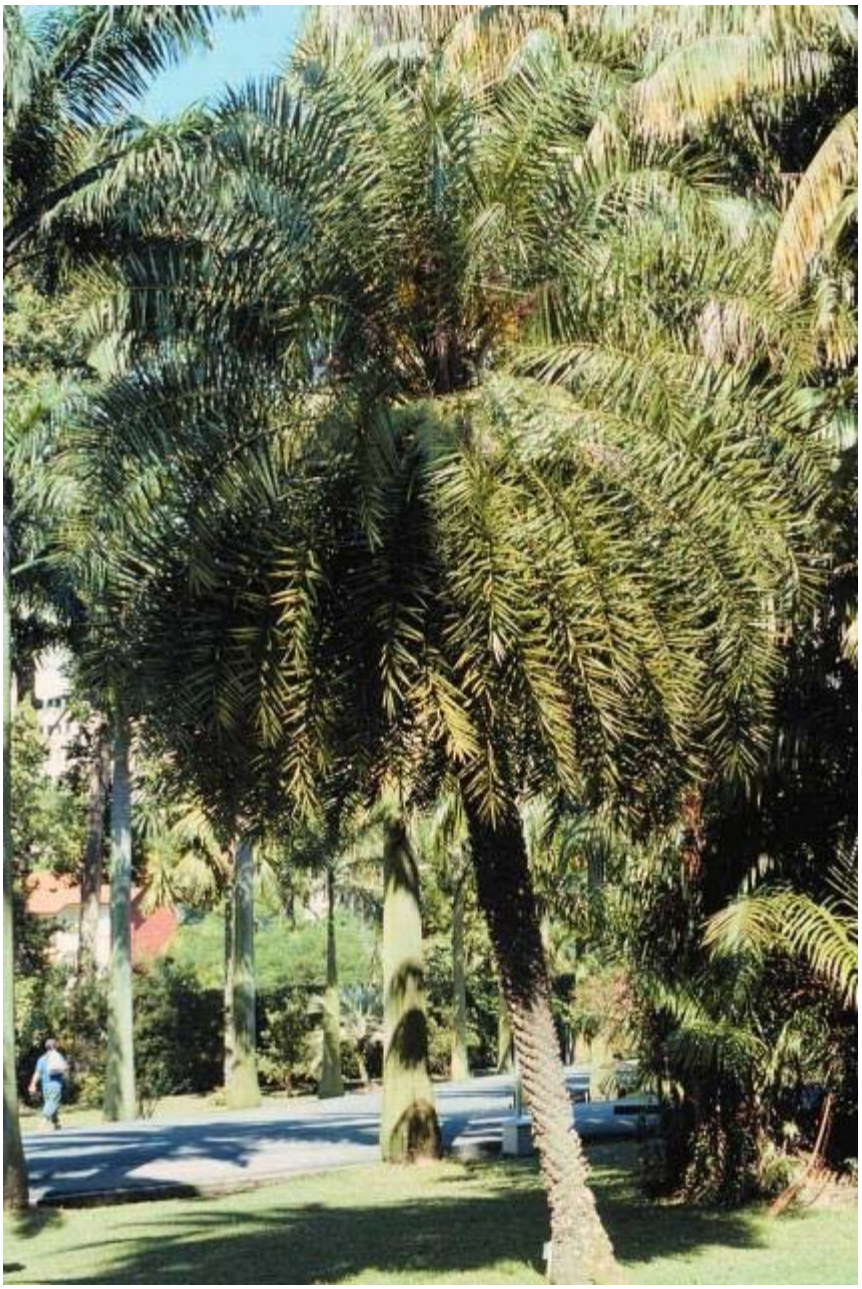


Figure 2. A healthy, properly pruned palm.

Secondly, not all palms require pruning. There is a large group of palms that have crownshafts—a region of smooth, usually green, tightly clasping leaf bases at the top of the gray trunk (Fig. 3). Palms with crownshafts should never need pruning if properly fertilized. A healthy old leaf will be completely green one day, completely orange-brown the second day (Fig. 4), and completely brown the third day, when it should fall off by itself. This is natural senescence.

Half-dead old leaves that remain on the palm for months at a time are usually deficient in potassium (K) (http://edis.ifas.ufl.edu/ep269) (Fig. 5) and should be fertilized (http://edis.ifas.ufl.edu/ep261) to prevent this problem.

Figure 3. *Hyophorbe lagenicaulis* (bottle palm) showing crownshaft, the distinct smooth green region of the stem above the gray wood.

Figure 4. Naturally senescing older leaf of *Veitchia* sp.

Figure 5. Leaf of areca palm (*Dypsis lutescens*) with severe K deficiency.

Old leaves in palms without crownshafts senesce similarly to those with crownshafts, but dead leaves may have to be pulled or cut off manually (Fig. 6). They usually drop down and hang against the trunk when they die, whereas K-deficient leaves usually remain in their normal position within the canopy.

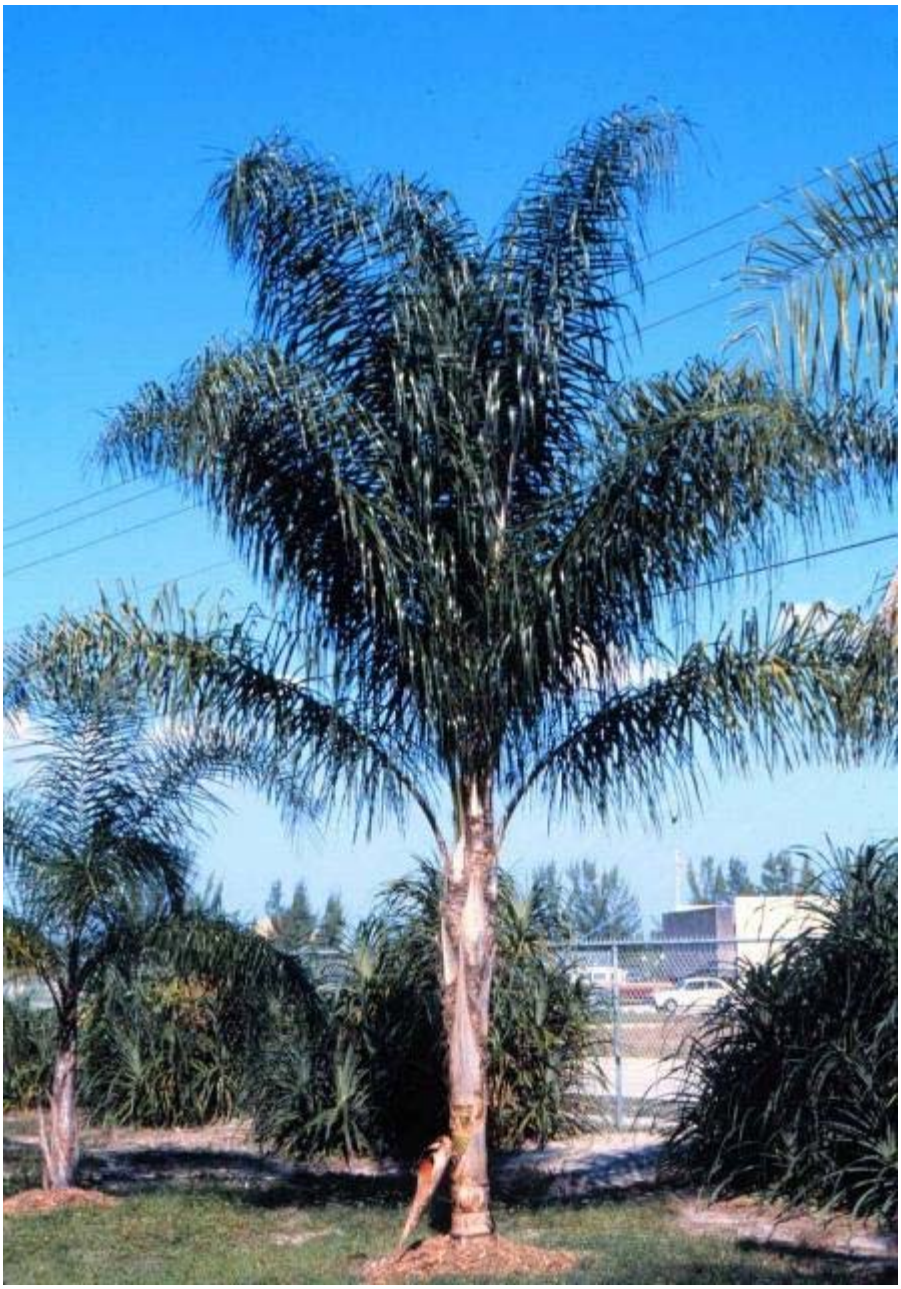


Figure 6. Queen palm (*Syagrus romanzoffiana*), a species of palm without a crownshaft.

Effects of pruning on palms

Pruning, or more importantly, excessive pruning, can affect palms in a number of ways. If palms are overpruned, the reduction in canopy size results in reduced photosynthetic capacity. In the short term, some studies have shown that overpruning can result in greater leaf production rates, but the resulting leaves were smaller in size than those on

unpruned palms (Endress et al. 2004; Mendoza et al. 1987; Oyama and Mendoza 1990). If this practice is repeated frequently, the palm may also develop a smaller trunk diameter (Fig. 7).

Figure 7. Overpruned sabal palms (*Sabal palmetto*) showing tapered trunks.

Pruning old K-deficient leaves can also impact palm health. Potassium, like nitrogen and magnesium, is a mobile element within the palm. Thus, symptoms occur first on the oldest leaves, as these are depleted of their K in order to sustain growth of the new leaves. The oldest leaf (on the left side) in the K-deficient spindle palm (*Hyophorbe verschafeltii*) shown in Fig. 8 shows necrosis and frizzling of most leaflets, but the rachis and the basal portion of most leaflets remain alive. The next oldest leaf (on right) shows no necrosis but has extensive orange translucent spotting on its leaflets. The youngest leaf is completely symptom free. If these older discolored leaves are removed, the palm then removes K from the next leaves up within the canopy that are currently green and symptom free. Repeated pruning of K-deficient older leaves has been shown to reduce the number of green, symptom-free leaves within the canopy (Broschat, 1994) and, in severely K-deficient palms, is known to accelerate the rate of decline leading to death of the palm.

Figure 8. Severely K-deficient spindle palm (*Hyophorbe verschafeltii*) showing extensive orange translucent spotting, leaflet tip necrosis, and reduced canopy size.

Some diseases, such as fusarium wilt of Canary Island date palm (*Phoenix canariensis*) (http://edis.ifas.ufl.edu/pp139) (Fig. 9), are known to be spread by pruning with infested tools (Elliott et al., 2004). Tools used to prune infected palms will be covered with a residue containing fungal material. If this tool is then used to prune living leaves on a healthy palm, the fungus will be transferred in the process. When pruning these palms, tools should be soaked in a disinfectant solution for 5 minutes before using them on another palm. Better yet, cut down the infected palm as soon as the disease is noticed to reduce the chances of spreading it to other palms. This is also a good reason not to prune off living older leaves to achieve the so-called "pineapple" effect on Canary Island date palms. Freshly cut living leaf bases release volatile chemicals that attract palm weevils, a serious insect pest of this palm (http://edis.ifas.ufl.edu/IN139).

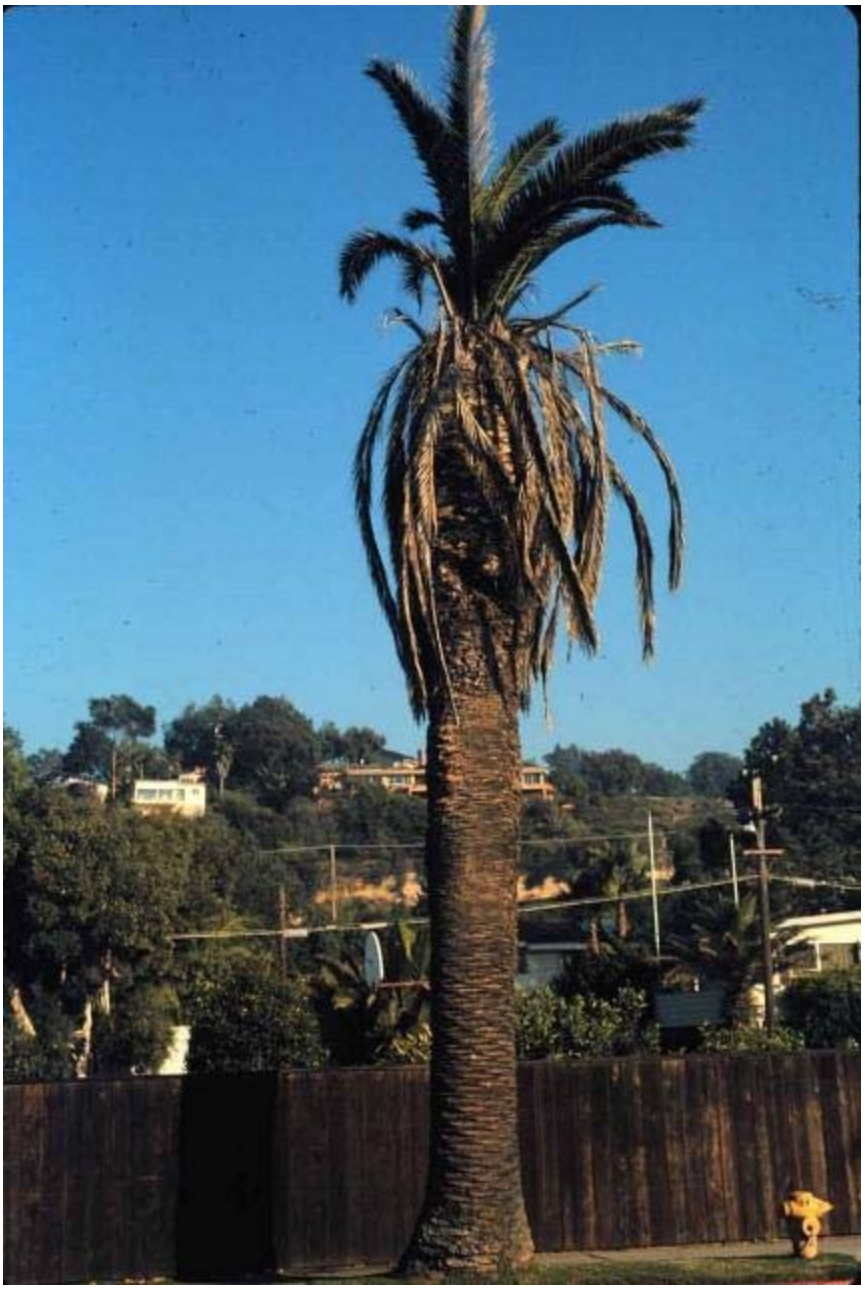


Figure 9. Fusarium wilt of Canary Island date palm (*Phoenix canariensis*).

Removal of old palm leaf skirts such as those found on Mexican fan palms (Fig. 10) can remove hiding places for rats, snakes, scorpions, and other desirable or not so desirable wildlife. Note that the skirt of dead leaves is beginning to fall off some of the palms in Fig. 10. In Florida, Mexican fan palms about 30 feet tall or less typically retain their dead leaves or leaf bases, but within a year or so of reaching this size, all of these old leaves will begin to drop off by themselves (Fig. 11). After that, these palms become mostly self-cleaning and should not have to be pruned manually.

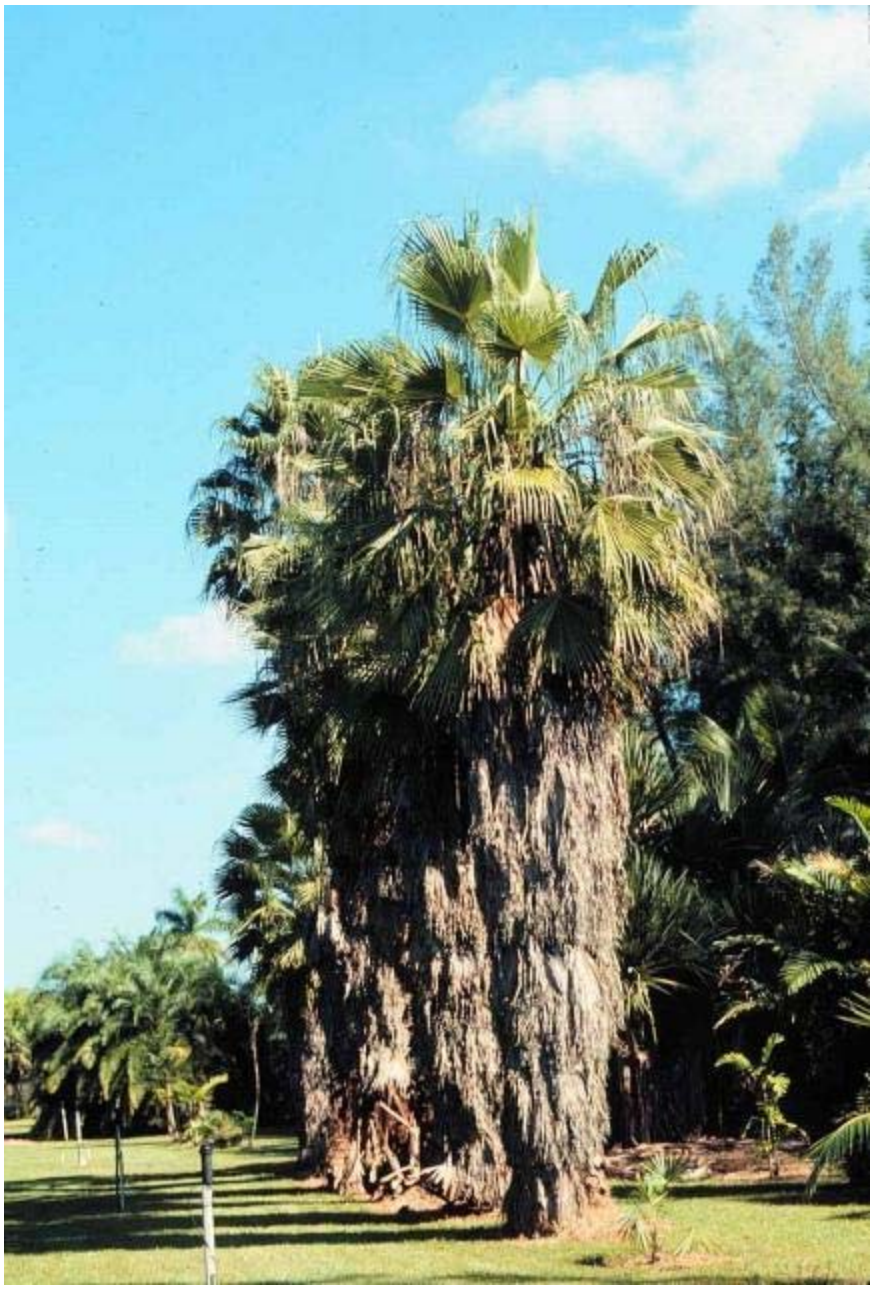


Figure 10. Relatively young Mexican fan palms (*Washingtonia robusta*) in Florida still retaining their skirt of old leaves. They are just beginning to fall off.

Figure 11. Leaf bases of Mexican fan palms (*Washingtonia robusta*) beginning to fall off in an irregular pattern.

Although not documented scientifically, there are anecdotal observations that overpruned palms fare more poorly in cold weather events than those with fuller canopies. The additional leaves or leaf bases can provide insulation to the

bud or meristem. After cold weather events, it is recommended that cold-damaged leaves not be pruned off until after the threat of additional cold weather (http://edis.ifas.ufl.edu/mg318) has passed.

Traditionally, arborists have been asked to prune palms prior to the arrival of hurricane season. "Hurricane-cut" palms have most of their leaves cut off, leaving only a tuft of the youngest leaves intact (Fig. 12). The intent was to reduce wind resistance in the palm, thereby protecting it from wind damage. However, observations of palms after the severe hurricane seasons of 2004 and 2005 in Florida showed that these "hurricane-cut" palms were more likely to have their crowns snapped off than those with fuller crowns (Figs 13–14). This may be because the youngest leaves left on these overpruned palms have not hardened off to the extent that older leaves have and lack the support of the older leaf bases (Pfalzgraf 2000). These observations are supported by research on African oil palms (*Elaeis guineensis*) (Calvez 1976; Chan and Duckett 1978). There is no evidence, however, that reduced trunk caliper reduces palm trunk strength.

Figure 12. An overpruned “hurricane-cut” coconut palm (Cocos nucifera).

Figure 13. Overpruned coconut palms after hurricane Wilma

Credit D. Caldwell, UF/IFAS

Figure 14. Unpruned coconut palms one block away after hurricane Wilma

Credit D. Caldwell, UF/IFAS

What should be pruned from palms?

Removal of completely dead leaves and flower and fruit stalks from palms is never a problem (Fig. 15). However, half-dead or discolored lower leaves are a symptom of K or other nutrient deficiencies (http://edis.ifas.ufl.edu/ep273) (Fig. 8). Despite their unattractive appearance, these leaves should be left on the palm as they are providing K in the absence of sufficient K in the soil. It is preferable to treat the K deficiency with effective fertilizers (http://edis.ifas.ufl.edu/ep261) to prevent these older leaves from becoming deficient than to cut them off, only to have the symptoms return.

Figure 15. *Coccothrinax* sp. with dead leaves and fruit stalks that should be removed.

If petioles of otherwise healthy leaves have become severely kinked or damaged due to wind (Fig. 16) or other mechanical injuries, there is no problem with removing the affected leaves. However, if a few kinked leaves are all

that remain on a palm following a severe windstorm, then it may be advisable to retain these damaged leaves as a source of photosynthates for the palm until new leaves can be produced.

Figure 16. Wind-damaged Bismarck palm (*Bismarckia nobilis*) with kinked petioles on living leaves that could be removed.

There is no evidence that removal of living flower or fruit stalks (Figs. 17–18) causes any harm to palms. In fact, studies have shown that removal of flower stalks results in increased leaf production rates since carbohydrates that would have been diverted into the production of flowers and fruits are now available for leaf production. Removal of flower stalks also prevents the production and drop of messy fruit that can eventually sprout into unwanted seedlings. In public areas, coconut palm fruit drop is a major liability concern, and it is much easier to remove small flower stalks than heavy clusters of fruit (Fig. 19).

Figure 17. Flowers of queen palm (*Syagrus romanzoffiana*).

Figure 18. Fruit clusters on Carpentaria palm (*Carpentaria acuminata*).

Figure 19. Clusters of coconuts on coconut palm *(Cocos nucifera*) that could create potential liability problems in public

When should palms be pruned?

Palm pruning is done primarily for aesthetic purposes. From the palm's perspective, there is no one time of the year that is better than another. Pruning dead leaves prior to hurricane season may reduce the chances that these easily detached leaves will become missiles in a storm. Ideally, a dead leaf would be pruned whenever it appears on a palm, but that simply isn't practical unless the palm is located in your own yard and is small enough to be easily accessible with common pruning tools. Commercially, palms are pruned on a fixed schedule (e.g., yearly, semi-annually, etc.) or whenever the palm's appearance becomes unacceptable to the owner.

Can living leaves also be removed?

Experienced tree pruners have observed that the time until dead leaves reappear at the bottom of the canopy can be extended if they remove a number of living leaves from the bottom of a palm canopy while they are pruning off dead leaves. This is one of the justifications used for overpruning palms. This concept has merit except that one critical factor is missing in most Florida palms. With the exception of some *Veitchia* spp., solitaire palms (*Ptychosperma elegans*), Christmas palms (*Adonidia merrillii*), and a few other species, virtually all palms in the state of Florida are deficient in K. Potassium deficiency (http://edis.ifas.ufl.edu/ep269) causes premature leaf senescence; therefore, K-deficient palms are unable to support a full canopy of leaves. For example, the average 'Malayan Dwarf' coconut palm (*Cocos nucifera*) in South Florida retains about 13 leaves due to K deficiency (Fig. 20). However, if properly fertilized and with no K deficiency, this species retains 26 or more leaves (Fig. 21). The average Canary Island date palm retains about 65 leaves in South Florida due to K deficiency, but without K deficiency this species usually retains 130–150 leaves. Thus, most palms in Florida only have half of their normal number of leaves prior to pruning.

Figure 20. A typical coconut palm (*Cocos nucifera*) in South Florida holding only 13 leaves due to K deficiency.

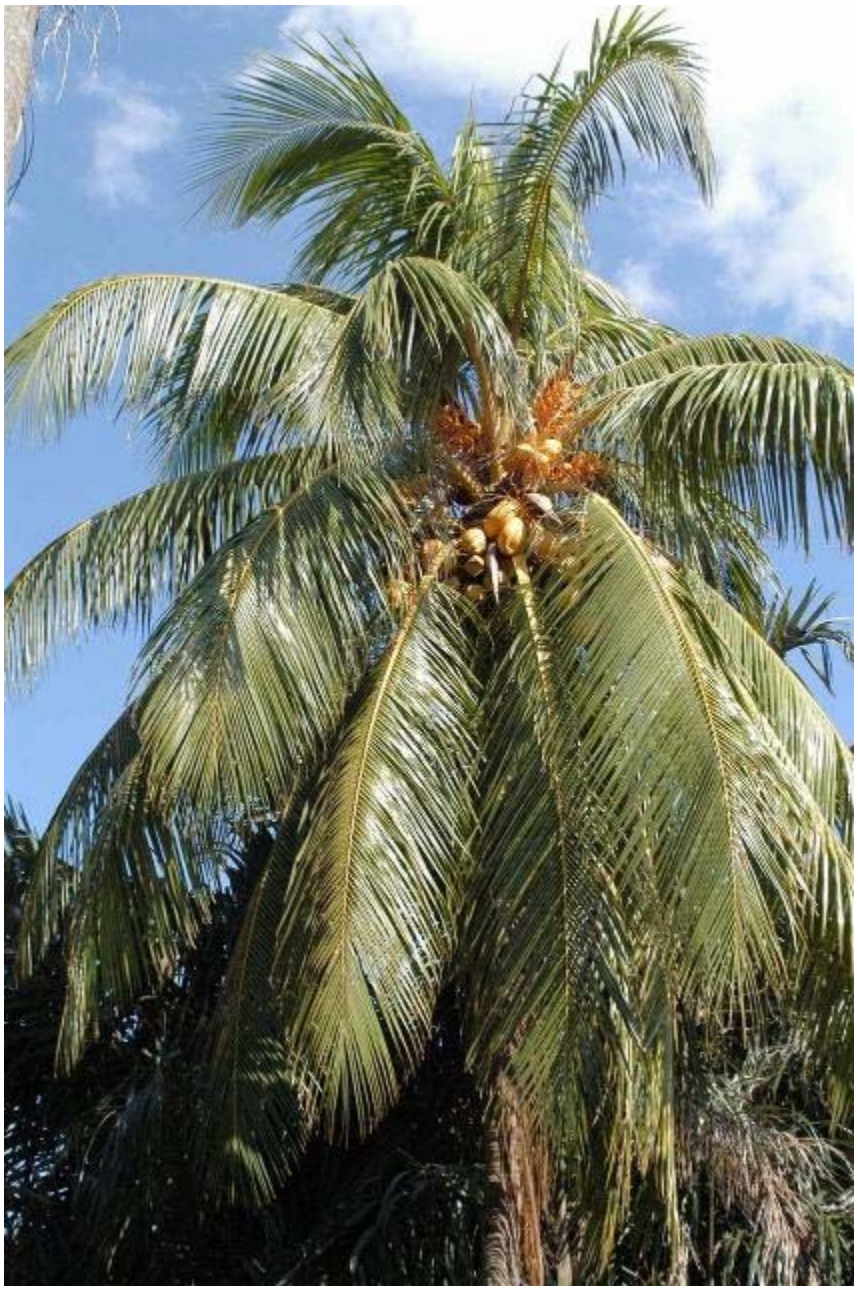


Figure 21. A properly fertilized coconut palm (*Cocos nucifera*) with a full rounded canopy of 26 leaves.

What is the relationship between K deficiency and pruning living leaves to "buy time" until the palm requires pruning again? If one starts with a K-sufficient palm with a full 360-degree canopy of healthy leaves, then, in theory, one could prune off as many living leaves from the bottom of the canopy as would be produced by the palm during the interval between prunings without ever seeing a single deficient or dead leaf on the palm during that time. In addition, the palm would never appear overpruned. For example, suppose one wishes to prune the leaves of a coconut palm on

an annual basis, and this species produces an average of 10 leaves per year. If starting with a healthy, 26-leaved, full-canopied palm (Fig. 21) and removing 10 leaves, the result would be a 16-leaf palm that looks similar to the one shown in Fig. 22. During the following year, this palm would slowly add new leaves to the canopy until, at 12 months, it would again appear like the one in Fig. 21. After about 13 months, the first dead leaf would appear at the bottom of the canopy, but since the palm would be repruned at 12 months, no dead leaves would ever appear on the palm. However, if one starts with a typical K-deficient South Florida coconut palm that only has 13 leaves (Fig. 20) and removes a full year's production of 10 leaves, the result would be an overpruned 3-leaf palm (Fig. 12) that, unfortunately, looks very familiar to most Floridians.

Figure 22. A coconut palm (*Cocos nucifera*) with 16 leaves.

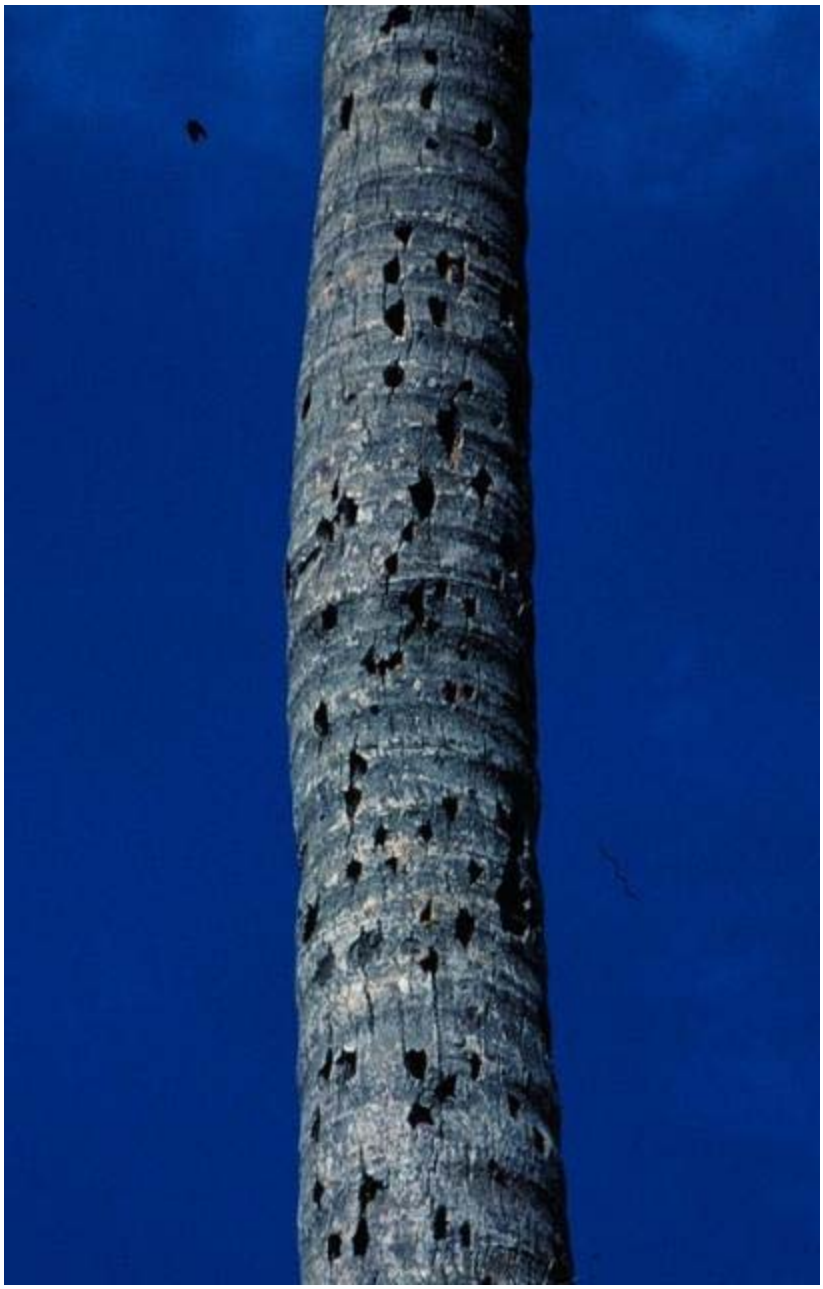


Figure 23. Permanent trunk wounds caused by climbing

Because pruning K-deficient leaves is known to accelerate the rate of decline from K deficiency (Broschat 1994), and because those K-deficient older leaves are serving as a source of K for the palm in the absence of sufficient K in the soil, only completely dead leaves should be removed from these palms. However, if K deficiencies have been corrected, then one could safely remove as many green leaves from the bottom of the canopy as would be produced during the interval between prunings without affecting palm nutritional status.

How many leaves do palms produce per year? That number varies widely among species. Estimates of leaf production rates in South Florida for a few species are shown in Table 1. For species not listed, leaf production rates

can easily be determined by cutting the tip off the spear leaf of a palm as a marker (or use another permanent system to mark the current spear leaf), waiting 12 months, and then counting the number of leaves above the marked leaf.

While the pruning regime discussed above is ideal for palms, it is unrealistic to expect that everyone will go to the effort and expense of correcting the K deficiency in their palms. It is a slow process that can take 3 years or longer. Thus, ANSI pruning standards for palms (ANSI 2001) state that no leaves with tips above the horizontal plane (9:00 and 3:00 positions on a clock face) should be removed. In Broward County, Florida, doing so is a civil offense and can result in a fine.

How to remove leaves

Leaves should be cut close to the trunk, but never cut into the trunk with a machete as this can result in wounds that have been shown to allow Thielaviopsis trunk rot (http://edis.ifas.ufl.edu/pp143), a lethal disease, to become established. For this reason, one should never pull off leaves that do not pull off easily. By pulling hard enough to eventually free these leaves, a small strip of trunk tissue will also tear off, again resulting in a wound that is readily colonized by *Thielaviopsis paradoxa*, the causal agent of Thielaviopsis trunk rot.

Finally, never use climbing spikes for pruning palm leaves, because wounds caused by the spikes will never heal (Fig. 23) and can become entry sites for diseases, such as Thielaviopsis trunk rot, or attractants for serious insect pests, such as palm weevils (http://edis.ifas.ufl.edu/in139).

References

ANSI (American National Standards Institute). 2001. Tree, shrub, and other woody plant maintenance—standard practices (pruning). National Arborist Assoc., Manchester, NH.

Broschat, T.K. 1994. Removing potassium deficient leaves accelerates rate of decline in *Phoenix roebelenii* O'Brien. HortScience 29:823.

Calvez, C. 1976. Influences on oil palm yield of pruning at different levels. Oleagineux 1:57-58.

Chan, S.K., and J. E. Duckett. 1978. Crown fracture and palm type-initial findings. Planter, Kuala Lumpur 54:142-148.

Elliott, M.L., T.K. Broschat., J.Y. Uchida, and G.W. Simone. 2004. Compendium of ornamental palm diseases and disorders. Amer. Phytopath. Soc. Press, St. Paul, MN.

Endress, B.A., D.L. Gorchov, and M.B. Peterson. 2004. Harvest of the palm *Chamaedorea radicalis*, its effects on leaf production, and the implications for sustainable management. Conserv. Biol. 18:822-830.

Mendoza, A., D. Pinero, and J. Sarukhan. 1987. Effects of experimental defoliation on growth, reproduction, and survival of *Astrocaryum mexicanum*. J. Ecol. 75:545-554.

Oyama, K., and A. Mendoza. 1990. Effects of defoliation on growth, reproduction, and survival of a neotropical dioecious palm *Chamaedorea tepejilote*. Biotropica 22:119-123.

Pfalzgraf, K. 2000. On the pruning of palms. Palms 44:47-49.

Tables

Table 1.

Estimates of leaf production rates for select species of palms in South Florida.

Species	Common name	Annual leaf production
Acoelorrhaphe wrightii	Paurotis palm	12
Butia capitata	Pindo palm	8
Cocos nucifera	Coconut palm	10
Latania lontaroides	Red latan palm	8
Phoenix canariensis	Canary Island date palm	50
P. dactylifera	Edible date palm	9
P. reclinata	Senegal date palm	15
P. roebelenii	Pygmy date palm	34
Roystonea regia	Royal palm	12
Sabal palmetto	Sabal palm	14
Washingtonia robusta	Mexican fan palm	60

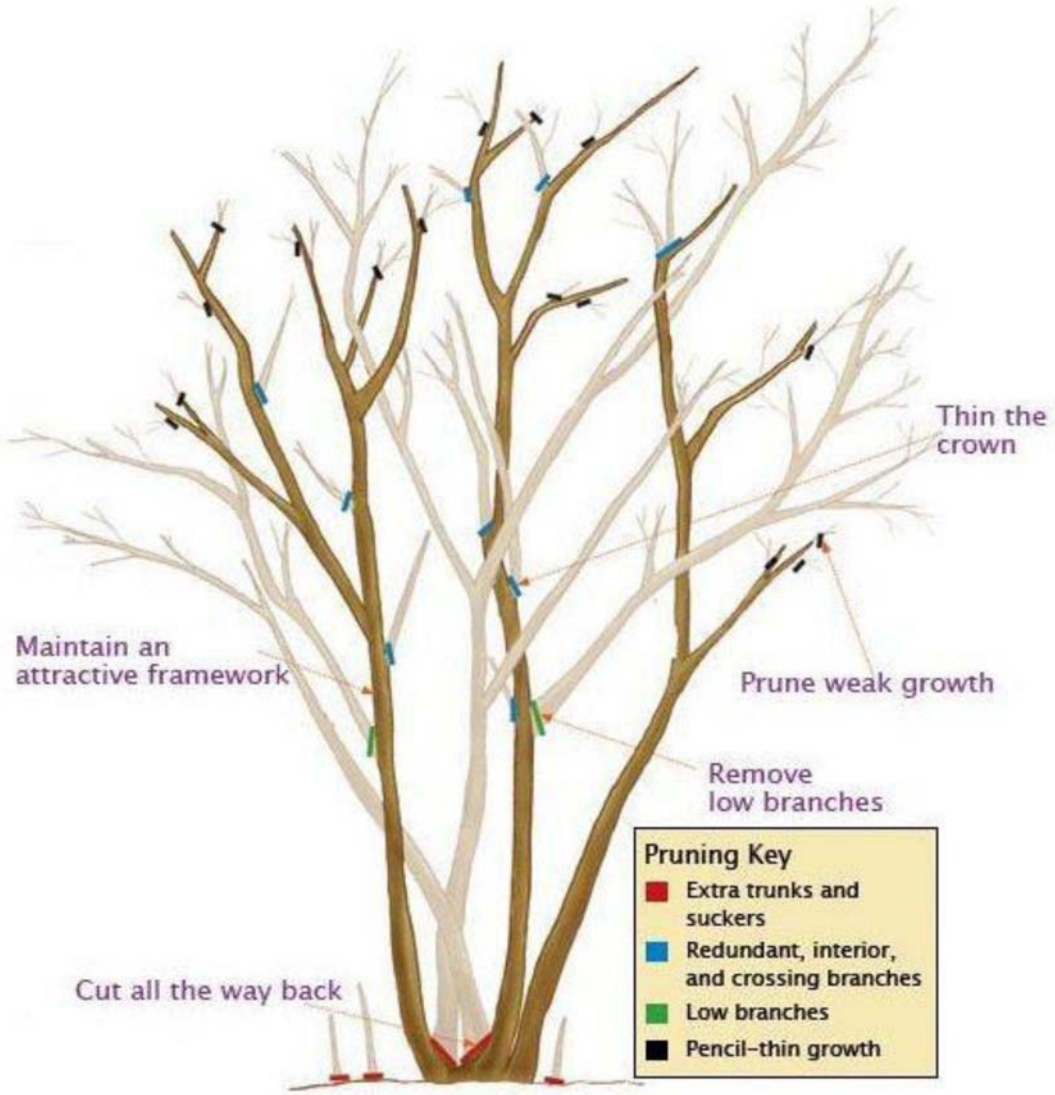
Footnotes

1. This document is ENH1182, one of a series of the Environmental Horticulture Department, UF/IFAS Extension. Original publication date April 2011. Revised May 2014. Visit the EDIS website at http://edis.ifas.ufl.edu.

2. Timothy K. Broschat, professor, Environmental Horticulture Department, Fort Lauderdale Research and Education Center, UF/IFAS Extension, Gainesville, FL 32611

B. CRAPE MYRTLE TREE PRUNING:

This section is minimum requirements to develop a comprehensive Crape Myrtle Tree Pruning Plan



Tree pruning may be necessary to maintain a tree in a safe condition, to remove dead branches, to promote growth, to regulate size and shape or to improve the quality of flowers, fruit or timber. Improper pruning can lead to trees becoming unsightly, diseased and/or potentially dangerous.

The three main pruning options are defined below:

Crown raising is simply removing branches from the bottom of the crown of a tree to provide clearance for pedestrians, vehicles, buildings or lines of site. For street trees the minimum clearance is often specified by municipal ordinance.

Crown thinning is a pruning technique primarily used on hardwood trees. Crown thinning is the selective removal of stems and branches to increase light penetration and air movement throughout the crown of a tree. The intent is to improve a tree's structure and form while making life uncomfortable for tree pests.

Crown reduction pruning is most often used when a tree has grown too large for its permitted space.

Pruning Standards. Tree cutting must conform to the following standards. The *red text* comes from *How to Prune Trees*, USDA Forest Service. *"Crew supervisors should have a copy of these Guidelines on the job site."*

"Flowering trees and shrubs . . . should . . . be pruned during the dormant season . . . " From USDA Forest Service, Footnote 1, Page 16.
Prune in January or thereafter, but before leaf formation. See Footnote 3.

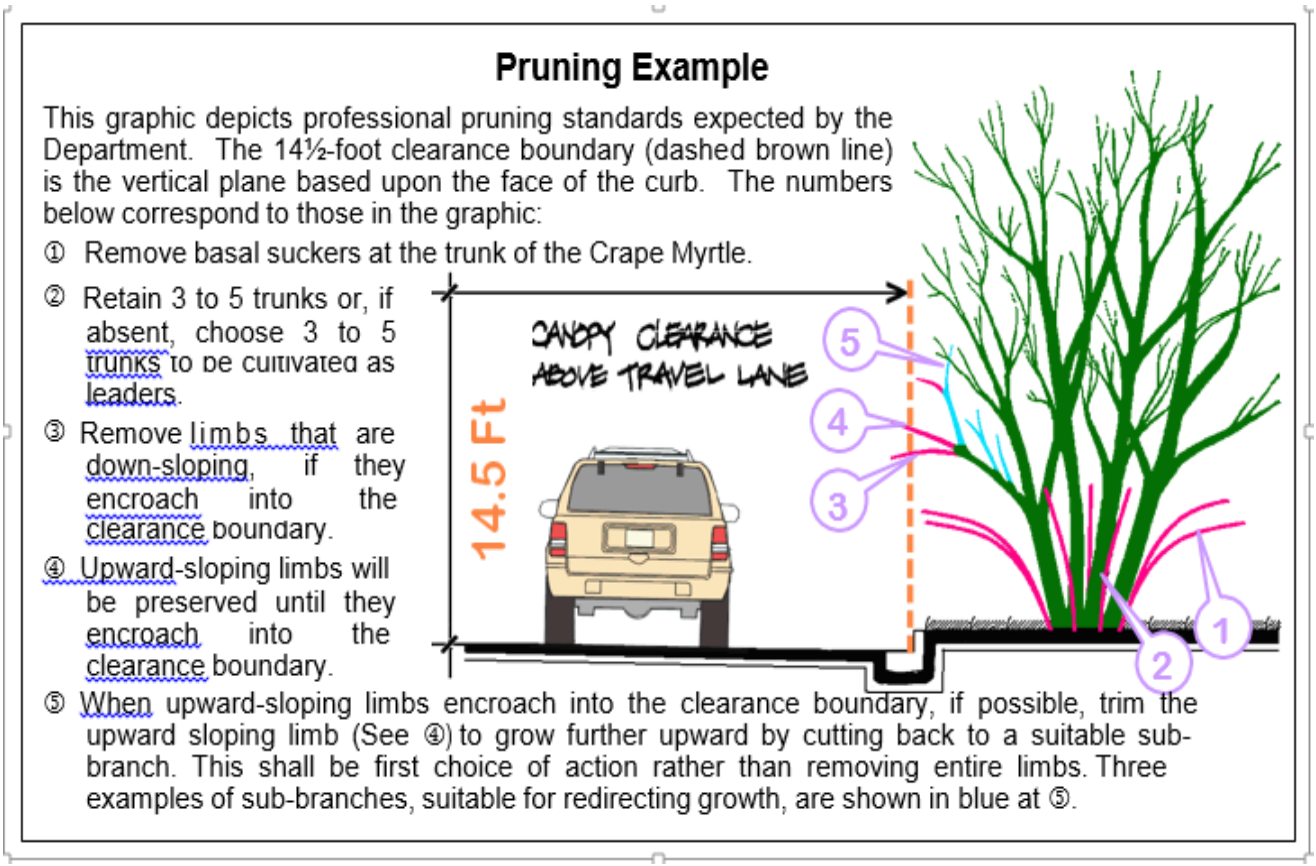
Trees must NOT be cut because road signs are in the wrong locations. Instead, relocate signs correctly.

"Topping and tipping are pruning practices that harm trees and should NOT be used." USDA, Footnote 1, Page 14. More details in Footnote 4.

1. From *How to Prune Trees* http://na.fs.fed.us/spfo/pubs/howtos/ht_prune/htprune-rev-2012-screen.pdf, USDA Forest Service, NA-FR-01-95 (revised 2012), a guide mandated upon pruning contractors by several FDOT districts.

Above photos are examples of excessive pruning of crape myrtle trees. To the best extent practical remove only the offending limbs or branches that are violating clear zone requirements, not at the trunk or base of these trees. If the entire tree is violating the Departments clear zone requirements, obstructing views, and creating a hazard to the traveling public then the Department or maintaining agency should have these tress relocated, or remove them from the right of way.

Multi-Trunked Crape Myrtle Pruning Technique



Multi-Trunk Crape Myrtles