
PALMS

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GRADING PALMS

INTRODUCTION

Florida Grades and Standards for Palms is constructed to measure only the health of palms at the time of delivery. Palm health is measured by an examination of the leaves, trunk and root ball.

These health characteristics are defined in a format used in calculating the grade of a palm. Form and dimensional characteristics are preferential criteria and are not used in the grading process. Therefore, palm grading is a process using this document, and palm specifying is a separate process left to the design professional. This document contains two glossaries of terms: one for palm grading and one for palm specifying. The glossary used by specifiers is included in the Processes for Specifying Palms.

This practical approach allows contractors, municipalities, inspectors and others charged with grading palms, to grade objectively using quantifiable benchmarks to identify quality-grown palms with health characteristics that have the best chance of transplant success.

The initial grade of the palm is assigned at the time of delivery. Although design specifications may require palms be maintained at a particular grade for a period of time, that requirement is outside the scope of this document.

GLOSSARY OF PALM GRADING TERMINOLOGY

The following terms are presented for use in the grading process.

Chlorosis: The loss of chlorophyll from leaves resulting in light green, yellow, orange, or white tissue. The presence of chlorosis denotes a nutrient deficiency, a physiological problem or the presence of a disease.



Chlorosis

Clustering palms: Palms that naturally have more than one trunk.

Container Grown Palm: Palms grown in container allowing transplanting without cutting roots. The roots must be completely contained within the container.

Depression: Mechanically produced indentation into the pseudobark that can indicate damage to underlying vascular tissue.

Excellent leaf: A fully emerged leaf (all leaflets are fully expanded) with a strong petiole with less than 1% of the area showing chlorosis, necrosis, nutrient deficiencies, leaf spots, pests or insect damage, or physical damage.



Extreme succulence

Extreme succulence: Soft, tender, elongated, weak petioles caused by over-fertilization, over-irrigation or over-crowding in the nursery. The palm may not survive when transplanted. Typically identified by weak elongated petioles.

Field Grown Palm: Palms grown and harvested from the ground by cutting the roots.

Good leaf: A fully emerged leaf (all leaflets are fully expanded) with a strong petiole with 1% to 10% of the area showing chlorosis, necrosis, nutrient deficiencies, leaf spots, pests or insect damage, or physical damage.

Grade: A designation of palm health assigned at the time of delivery using this document to evaluate the palm. One of three grades is possible: Florida Fancy, Florida No. 1 or Florida No. 2.

Leaf count: The number of fully emerged (all leaflets are fully expanded) good or excellent leaves counted during the grading process.

GLOSSARY OF PALM GRADING TERMINOLOGY

Necrosis: Desiccated plant tissue typically but not necessarily brown, tan or gray in color.

Primary Trunk: Trunks $\frac{3}{4}$ or greater the height of the tallest clear trunk in clustering palms and single trunk palms intentionally grown with more than one trunk.

Pseudobark: Outer non-vascular portion of the trunk. Pseudobark damage can be unsightly but can also indicate damage to underlying vascular tissue.

Pup scars: Scars near the base of the trunk in clonally produced palms (palms propagated by division or propagated from offshoot removal; e.g., *Phoenix dactylifera*) that are the result of offshoot or pup removal. These scars present no health risk to the palm.

Re-grade: An official re-grade is conducted by the Florida Department of Agriculture and Consumer Services Division of Plant Industry. The request must be submitted to the Chief Plant Inspector, Division of Plant Industry within 30 days following delivery.

Root ball measurement: Measurement from the lowest part of the trunk exclusive of exposed roots or persistent leaf bases perpendicular out to the edge of the root ball for field grown palms. Gradable palms in containers are not subject to root ball measurements.

Tipped Leaf: A specified procedure of shortening the leaves by cutting the leaf tips. Tipped leaves are not gradable therefore this must occur after the grading process.

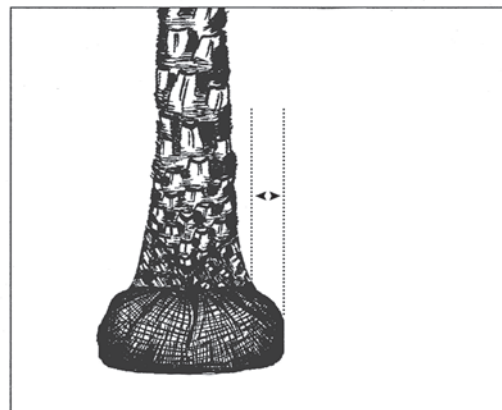
Trunk tapering: The tapering or reduction in diameter with increasing trunk height.

Vascular tissue: Water and carbohydrate conducting plant tissue that is covered by the outer non-vascular pseudobark.

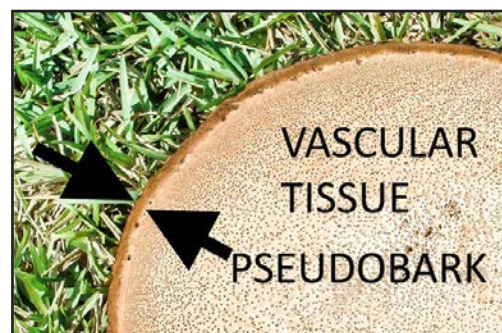
Vertical fissures: Naturally occurring vertical expansion cracks. These present no health risk to the palm when less than one-inch deep.



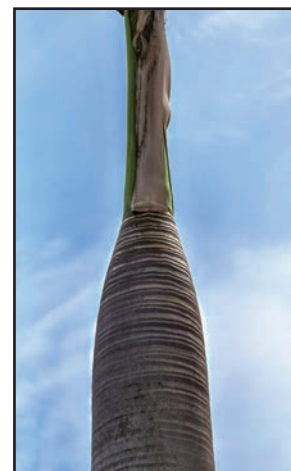
Pup scars



Root ball measurement



VASCULAR TISSUE
PSEUDOBARK



Trunk taper

REQUIREMENTS FOR LEAF COUNT AND ROOT BALL MEASUREMENT

Each of the palm species in Table 1 has been assigned a minimum leaf count of good or excellent leaves and root ball measurement to qualify as gradable. Note that minimum leaf counts are to establish a root-to-shoot ratio for transplant success, and are not necessarily the recommended leaf counts for established palms.

Species not listed in Table 1 are graded using the downgrading and eliminating factors other than the minimum leaf count and root ball measurement. For clustering palms and single trunked palms intentionally grown with more than one trunk, each primary trunk is graded as a single trunk palm. The final grade of the palm is the lowest grade applied to the primary trunks.

Use the grading forms to evaluate eliminating and downgrading factors.

**Table 1. Palms Commonly Used in Florida
(Revised November 2016)**

SCIENTIFIC NAME	COMMON NAME	MINIMUM LEAF COUNT ⁽¹⁾			MINIMUM ROOT BALL MEASUREMENT ⁽²⁾ IN INCHES BASED ON OVERALL HEIGHT (OA)		
		FL FANCY Excellent Leaves	FL No. 1 Good or Excellent Leaves	FL No. 2 Good or Excellent Leaves	## ft or less = ## inches	More than ## ft and less than ## ft = ## inches	More than ## ft = ## inches
<i>Acoelorrhaphe wrightii</i>	Paurotis Palm	6	5	4	4 at any OA		
<i>Adonidia merrillii</i>	Christmas Palm	6	5	4	6 at any OA		
<i>Archontophoenix alexandrae</i>	Alexandra Palm	5	4	3	6 at any OA		
<i>Archontophoenix cunninghamiana</i>	Piccabeen Palm	5	4	3	6 at any OA		
<i>Arenga engleri</i>	Dwarf Sugar Palm	5	4	3	4 at any OA		
<i>Arenga tremula</i>	Dwarf Sugar Palm	5	4	3	4 at any OA		
<i>Bismarckia nobilis</i>	Bismarck Palm	6	5	4	≤8 FT=6	>8FT ≤ 18 FT=9	>18 FT=12
<i>Butia odorata (formerly B. capitata)</i>	Pindo Palm	12	10	7	≤14 FT=6		>14 FT=9
<i>Butiagrus nabonnandii</i>	Mule Palm	15	12	9	≤15 FT=6		>15 FT=9
<i>Carpentaria acuminata</i>	Carpentaria Palm	6	5	4	6 at any OA		
<i>Caryota mitis</i>	Clustering Fishtail Palm	6	5	4	4 at any OA		
<i>Chamaedorea cataractarum</i>	Cat Palm	5	4	3	4 at any OA		
<i>Chamaedorea erumpens</i>	Bamboo Palm	5	4	3	4 at any OA		
<i>Chamaedorea microspadix</i>	Hardy Bamboo Palm	5	4	3	4 at any OA		
<i>Chamaedorea seifrizii</i>	Reed Palm	5	4	3	4 at any OA		
<i>Chamaerops humilis</i>	European Fan Palm	20	16	12	6 at any OA		
<i>Chambeyronia macrocarpa</i>	Red Feather Palm	6	5	4	4 at any OA		
<i>Coccothrinax spp. (incl. C. alta, argentata, C. crinita, C. miraguama)</i>	Silver Palm	8	6	5	≤12 FT=6		>12 FT=9
<i>Cocos nucifera</i>	Coconut Palm	6	5	4	≤20 FT=6		>20 FT=9
<i>Copernicia alba</i>	Caranday Palm	30	24	18	≤15 FT=6		>15 FT=9
<i>Copernicia prunifera</i>	Carnauba Palm	25	20	15	6 at any OA		
<i>Dictyosperma album</i>	Princess Palm	9	7	6	6 at any OA		
<i>Dypsis cabadae</i>	Cabada Palm	4	3	2	4 at any OA		

⁽¹⁾ Refer to Leaf Count Definition in the Grading Glossary

⁽²⁾ Refer to Root Ball Measurement Definition in the Grading Glossary

6 ⁽³⁾ Exempt from abrupt tapering grading factors

<i>Dypsis decaryii</i>	Triangle Palm	10	7	5	≤15 FT=6		>15 FT=9
<i>Dypsis lastelliana</i>	Teddy Bear Palm	8	6	5	6 at any OA		
<i>Dypsis lutescens</i>	Areca Palm	6	5	4	4 at any OA		
<i>Heterospathe elata</i>	Sagisi Palm	6	5	4	6 at any OA		
<i>Hyophorbe lagenicaulis</i> ⁽³⁾	Bottle Palm	4	3	2	6 at any OA		
<i>Hyophorbe verschafeltii</i>	Spindle Palm	4	3	2	6 at any OA		
<i>Latania loddigesii</i>	Blue Latan Palm	6	5	4	6 at any OA		
<i>Latania lontaroides</i>	Red Latan Palm	6	5	4	6 at any OA		
<i>Leucothrinax morrisii</i>	Key Thatch Palm	8	6	5	6 at any OA		
<i>Livistona australis</i>	Australian Fan Palm	10	8	6	≤15 FT=6		>15 FT=9
<i>Livistona chinensis</i>	Chinese Fan Palm	10	8	6	≤20 FT=6		>20 FT=9
<i>Livistona decora</i> (formerly <i>L. decipiens</i>)	Ribbon Palm	25	20	15	≤20 FT=6		>20 FT=9
<i>Livistona nitida</i>	Carnavon Gorge	20	16	12	≤20 FT=6		>20 FT=9
<i>Livistona saribus</i>	Taraw Palm	20	16	12	≤20 FT=6		>20 FT=9
<i>Phoenix canariensis</i>	Canary Island Date Palm	15	12	9	≤12 FT=6	>12 FT ≤ 20 FT=9	>20 FT=12
<i>Phoenix dactylifera</i> (Medjool)	Date Palm	29	23	17	≤26 FT=6	>26 FT ≤ 39 FT=9	>39 FT=12
<i>Phoenix dactylifera</i> (Zahidi)	Date Palm	29	23	17	≤26 FT=6	>26 FT ≤ 39 FT=9	>39 FT=12
<i>Phoenix dactylifera</i> (Deglet Noor)	Date Palm	25	20	15	≤26 FT=6	>26 FT ≤ 39 FT=9	>39 FT=12
<i>Phoenix reclinata</i>	Senegal Date Palm	15	12	9	≤20 FT=6	>12 FT ≤ 20 FT=9	>20 FT=9
<i>Phoenix roebelenii</i>	Pygmy Date Palm	25	20	15	6 at any OA		
<i>Phoenix sylvestris</i>	Wild Date Palm	40	32	24	≤15 FT=6	>15 FT ≤ 25 FT=9	>25 FT=12
<i>Pseudophoenix sargentii</i>	Buccaneer Palm	8	6	5	6 at any OA		
<i>Ptychosperma elegans</i>	Solitaire Palm	5	4	3	6 at any OA		
<i>Ptychosperma macarthurii</i>	Macarthur Palm	5	4	3	4 at any OA		
<i>Rhapis excelsa</i>	Lady Palm	7	6	4	4 at any OA		
<i>Rhapis multifida</i>	Finger Palm	5	4	3	4 at any OA		
<i>Roystonea regia</i>	Royal Palm	6	5	4	≤20 FT=6	>20 FT ≤ 30FT=9	>30 FT=12
<i>Sabal</i> sp.	Cabbage Palm (Regenerated)	4	3	2	3 at any OA		
<i>Sabal</i> sp.	Cabbage Palm (Cropped)	0	0	0	3 at any OA		
<i>Syagrus romanzoffiana</i>	Queen Palm	8	6	5	≤20 FT=6		>20 FT=9
<i>Thrinax radiata</i>	Florida Thatch Palm	8	6	5	6 at any OA		
<i>Trachycarpus fortunei</i>	Windmill Palm	12	10	7	6 at any OA		
<i>Veitchia arecina</i> (formerly <i>V. montgomeryana</i>)	Montgomery Palm	5	4	3	≤20 FT=9		>20 FT=12
<i>Washingtonia robusta</i>	Mexican Fan Palm	8	6	5	≤20 FT=6		>20 FT=9
<i>Wodyetia bifurcata</i>	Foxtail Palm	8	6	5	≤20 FT=6		>20 FT=9

* Refer to Leaf Count Definition in the Grading Glossary
 ** Refer to Root Ball Measurement Definition in the Grading Glossary
 *** Exempt from abrupt tapering grading factors

PALM GRADING STEPS

Following are the steps to complete the Palm Grading Form:

- Step 1.** Examine the palm using the list of eliminating factors on the Palm Grading Forms. If there are no eliminating factors, proceed to Step 2.
- Step 2.** Refer to Table 1 and note the minimum leaf count and root ball measurement for the species being graded.
- Step 3.** Examine the palm against the list of downgrading factors on the Palm Grading Forms.

PALM GRADING FORM

Palm # _____

Species: _____

GRADES

Florida Fancy: A palm with no eliminating or downgrading factors, meeting the requirements shown in Table 1 with 100% excellent leaves. One 'YES' response to the downgrading factors listed above renders the palm a Florida No. 1.

Florida No. 1: A palm with no eliminating factors, meeting the requirements shown in Table 1. One 'YES' response to the downgrading factors listed above renders the palm a Florida No. 2.

Florida No. 2: A palm with no eliminating factors, meeting the requirements shown in Table 1. One 'YES' response to the downgrading factors listed above renders the palm not gradable.

Step 1. Eliminating factors are severe problems that decrease the palm's chance for survival in the new site. Any one of these factors eliminates the palm from Grades and Standards consideration. The palm is termed "Not Gradable," regardless of other attributes.

Answer 'YES' if true

- a) Evidence of palm weevils or symptoms of lethal diseases such as Fusarium wilt, phytoplasma diseases, Ganoderma butt rot, Thielaviopsis trunk rot or Phytophthora bud rot. a) _____
- b) Wood boring insect damage. b) _____
- c) Exposure of or damage to vascular tissue.* c) _____
- d) Trunk taper within the top foot of the woody trunk reducing the diameter by more than 20%. d) _____
- e) Root ball vertical surface has less than 50% covered by visible roots, excluding top six inches. (For Regenerated Sabal only) e) _____
- f) Extreme succulence. f) _____
- g) Naturally occurring vertical fissures exceeding one inch in depth. g) _____
- h) Pseudobark damage totaling more than 20 square inches.** h) _____
- i) Failure to meet the minimum requirements for root ball measurement or Florida No. 2 leaf count in Table 1. i) _____

One or more 'YES' responses to the eliminating factors listed above, renders the palm not gradable.

Step 2. Initial grade established by Table 1: _____

Step 3. Downgrading Factors

Answer 'YES' if true

- a) Pseudobark damage between 5 and 10 square inches. Enter one 'YES' for each occurrence.** a) _____
- b) Pseudobark damage between 10 and 20 square inches. This is in addition to the previous pseudobark damage downgrade.** b) _____
- c) Trunk taper within the top foot of the woody trunk between 5% and 10%. c) _____
- d) Trunk taper within the top foot of the woody trunk between 11% and 15%. This is in addition to the previous trunk taper downgrade. d) _____

* Excluding pup scars in clonally produced palms, pesticide injection sites and naturally occurring vertical fissures less than one-inch in depth.

** Excluding naturally occurring vertical fissures less than one-inch in depth and pesticide injection sites

Final Grade: _____

PROCESSES FOR SPECIFYING PALMS

Florida Grades and Standards for Palms is constructed to measure only the health of palms at the time of delivery. Design professionals seeking specific palm form and dimensional characteristics must include these requirements in the contract documents, along with details and other installation, establishment and warranty requirements. The terms defined in the Glossary of Palm Grading and Palm Specifying are used in the Florida Grades and Standards for Palms as the prescribed language for specifying palms. Some specifications to consider are listed below:

Trunk Measurements

- Caliper at specified heights
- Clear Trunk
- Clear Wood
- Terminus Height

Trunk Characteristics

- Curved Trunk or straight trunk or multi trunk
- Type of Leaf Base Trimming
- Pseudobark Appearance

Leaves

- Cropped Palm
- Canopy Spread
- Leaf Tipping (after grading)
- Leaf counts of those species not listed in Table 1

Other

- Overall Height
- Rootball measurements of those species not listed in Table 1
- Certifications
- Vertical clearance

GLOSSARY OF PALM SPECIFYING TERMINOLOGY

Abrupt constriction: A point along the trunk having a reduction in diameter greater than 10% than the diameter within 1 foot above and/or below, typically indicating a period of stress occurred in the past.

Boot: The leaf base or enlarged basal portion of the petiole remaining affixed to the trunk after the leaf has died and been broken or cut off.

Booted: Used to specify palms with leaf bases still attached to the trunk.

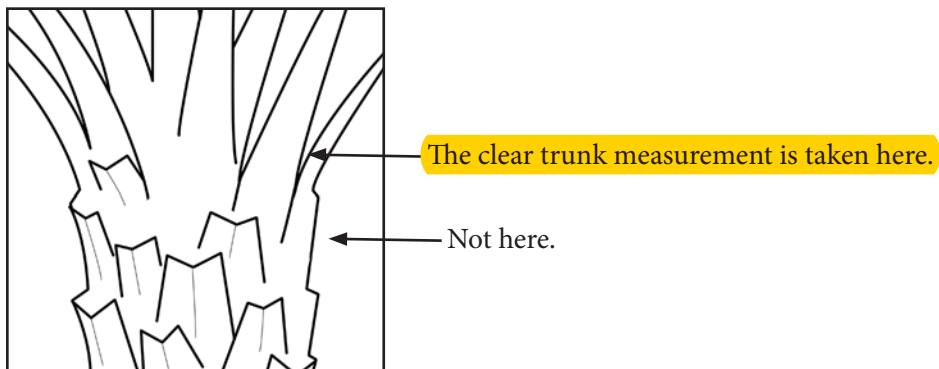
Caliper: The diameter of a palm's trunk. The height that this diameter is measured must be specified.

Canopy spread: A measurement taken from leaf tip to leaf tip, in their natural state, at the widest point.

Character palms, Curved palms: Used to specify unusual trunk shapes.

Clean trunk: See "Leaf base trimming (Clean cut photo)."

Clear trunk: A measurement from the top of the root ball to the point where the lowest untrimmed leaf's petiole diverges from the trunk. The remaining leaf counts must meet the minimum requirements for the chosen grade - See leaf counts in Table 1 for FL Fancy, FL No. 1 and FL No. 2. Reducing the leaf count to achieve more clear trunk can result in a lower grade.



Clear wood, Gray Wood: A measurement from the top of rootball to the highest point on the trunk free of persistent leaf bases. On palms with a crownshaft, the measurement is from the top of rootball to the base of the crownshaft. Palms with very persistent leaf bases may not have clear wood.

Cropped palms: Palms with all leaves removed before transplanting. Typically performed on field harvested Sabal species. Previously known as Hurricane Cut.

Crownshaft: A conspicuous neck-like structure formed by tubular leaf bases on some pinnate-leaved palms.

Debooted: See "Clean trunk" definition.

Frond: A common term used to describe a palm leaf.

Gray wood: See "Clear wood" definition.

Hurricane cut: See "Cropped palms" definition.

Leaf base: The basal portion of a leaf that is attached to the trunk.

GLOSSARY OF SPECIFYING TERMINOLOGY

Leaf base trimming: A process of cutting leaf bases to achieve a particular appearance, typically performed by the grower. There are several types of trimming cuts that may be specified including classic, clean, diamond and shelf.



Classic cut



Clean cut



Diamond cut



Shelf cut

Leaf length: The distance along the petiole from the point where the petiole diverges from the trunk to the leaf's tip.

Main trunk: For clustering palms and single trunk palms intentionally grown with more than one trunk the tallest trunk in the cluster is considered the main trunk.

Multi-trunk: A term used to specify multiple single trunked palms grown together.

Overall height: The highest point in the canopy measured from the top of rootball to the natural position of the last fully emerged (all leaflets are fully expanded) leaf.

Regenerated palms: Field-grown or collected palms that have some type of containment placed around the root ball. The palm is maintained until the minimum number of good or excellent leaves are present. A substantial number of new root tips are visible on the outside of the root ball. This process takes several months or more and can improve transplant success.



Regenerated palms



Regenerated root ball

Slick trunk: Trunk with leaf bases mechanically removed often causing damage to the pseudobark and exposing vascular tissue. This practice is not recommended.

Sloughing: The natural degradation and dropping of leaf bases. This is not detrimental to the palm's health.

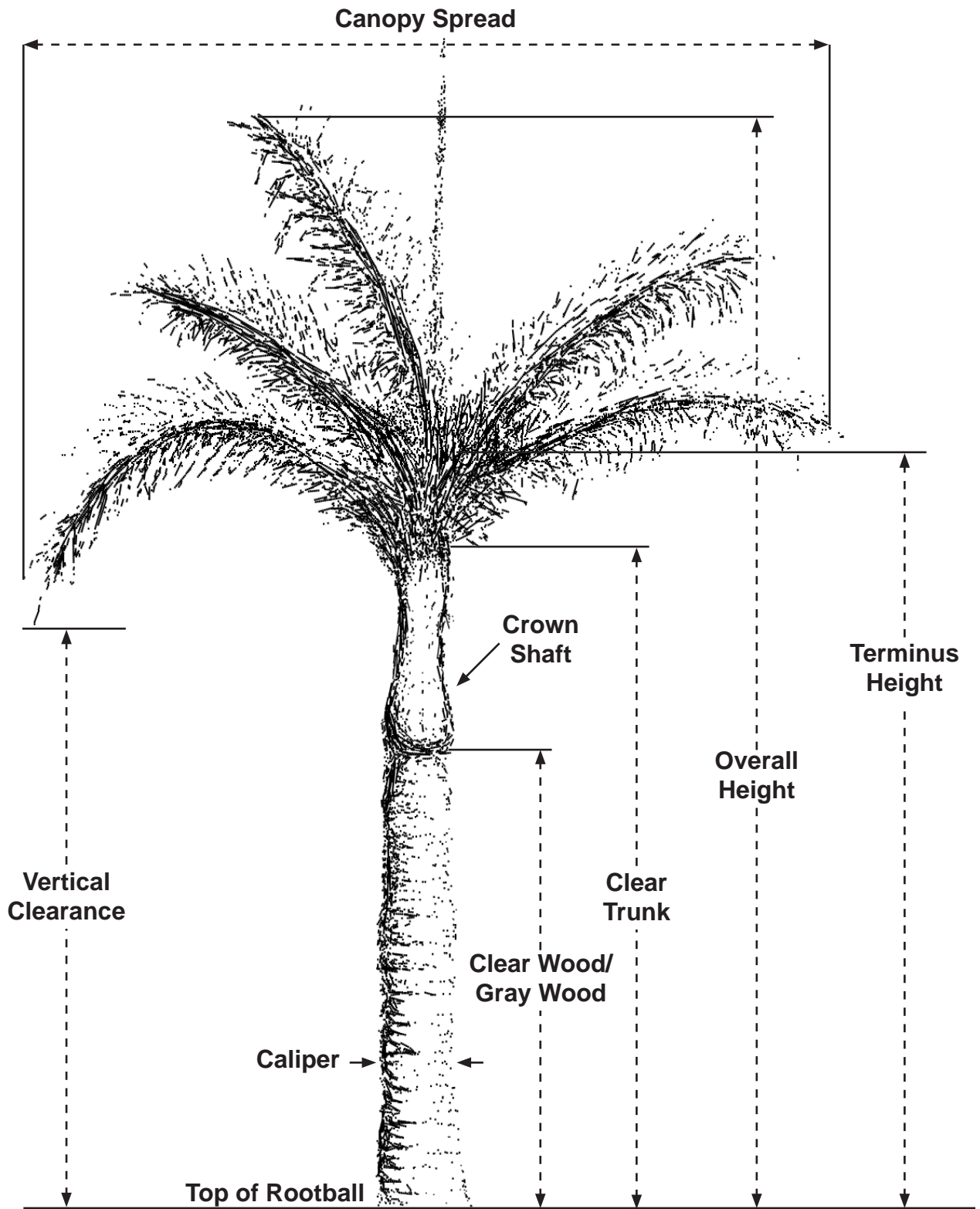
Suckers: Small shoots emerging from the base of main trunks in clustering palms.

Terminus height: Measurement from the top of rootball to the point of emergence of the spear leaf. This is a practical measurement method for cropped palms.

Vertical clearance: A measurement from the top of rootball to the lowest leaf. Pruning may be required to achieve clearance for pedestrians, vehicles, signs, etc. If minimum leaf counts are maintained, grading is not affected.

PALM SPECIFYING TERMS ILLUSTRATION

Specifications regarding form and dimensional characteristics (other than grading factors) are the responsibility of design professionals. The following illustrates terms that provide a common language for describing parts and measurements of palms.



TRANSPLANTING PALMS - SABAL SPECIES

Sabal palms (*Sabal palmetto*) are the most widely planted palms in the southeastern United States. Virtually all are mature specimens harvested from natural stands because their slow growth rate makes nursery production uneconomical. Recognizing that sabal palms are harvested from the wild, they have been separated from the other palms in this document and are addressed in this section. **Note that some of the conditions applied to sabal palms as eliminating factors in previous editions are modified in this edition.**

Sabal palms grow naturally in many diverse habitats including swamps, pine flatlands and fire climax ecosystems, and are adaptable to a wide range of landscape environments. They are recognized as a renewable but finite natural resource. In the past, many sabal palms that were otherwise healthy, but had certain downgrading factors such as superficial fire damage, were not collected because they were considered not gradable. This document no longer considers superficial fire damage or superficial methods to remove charred areas as eliminating factors.

It is also important to consider the methods used to harvest sabal palms. Sabal palms are usually harvested using heavy equipment which may cause trunk damage. However, if this damage occurs in pseudobark trunk tissue, it is unlikely to be an entry point for insects and disease and does not compromise the structural integrity of the palm.

Historically, survival rates for transplanted sabal palms were often low. In sabal palms no cut roots survive; however, roots are continually produced from the root initiation zone. In the late 1980s, studies showed that the removal of all leaves (cropping) increased the survival rate of transplanted sabal palms by 30%. Since that time, the standard procedure for transplanting collected sabal palms is to remove all leaves during harvesting operations. Postharvest care greatly affects the survivability of all palms. If the root ball desiccates, newly formed adventitious roots may die.

Inadequate watering may lead to decline and eventual death of the palm. It may also predispose the palm to insect infestation and disease.

Excessive removal of leaf bases is another factor that may affect survivability of transplanted sabal palms and should be avoided. Removal of leaf bases may lead to the desiccation of the palm. This may also increase the likelihood of the introduction of trunk rotting fungi like *Thielaviopsis*. *Thielaviopsis* has become one of the major factors in the death of transplanted sabal palms, resulting in losses of up to 90%. In addition, excessive removal of leaf bases may also predispose the palm to insect infestations such as palm weevils.

Recent postharvest production methods include the concept of regeneration. Regeneration is the establishment of a new root system and leaves. This is accomplished by wrapping the root ball of a freshly harvested sabal palm with multiple layers of plastic sufficient to contain the emerging roots, or placing the freshly harvested palm into a container. The palm is held for a sufficient amount of time to establish a new root system and leaves.

REFERENCES

Palm Transplanting

Transplanting Palms in the Landscape <http://edis.ifas.ufl.edu/ep001>

Nutritional and Physiological Problems of Palms

Nutrient Deficiencies of Landscape and Field-Grown Palms in Florida <http://edis.ifas.ufl.edu/ep273>

Physiological Disorders of Landscape Palms <http://edis.ifas.ufl.edu/ep263>

Palm Diseases

Bud Rot of Palm <http://edis.ifas.ufl.edu/pp144>

Fusarium Wilt of Canary Island Date Palm <http://edis.ifas.ufl.edu/pp139>

Fusarium Wilt of Queen Palm and Mexican Fan Palm <http://edis.ifas.ufl.edu/pp278>

Ganoderma Butt Rot of Palms <http://edis.ifas.ufl.edu/pp100>

Graphiola Leaf Spot (False Smut) of Palm <http://edis.ifas.ufl.edu/pp140>

Lethal Yellowing (LY) of Palm <http://edis.ifas.ufl.edu/pp146>

Texas Phoenix Palm Decline <http://edis.ifas.ufl.edu/pp163>

Thielaviopsis Trunk Rot of Palm <http://edis.ifas.ufl.edu/pp143>

Insect Pests of Palms

Palmetto weevil, *Rhynchophorus cruentatus* Fabricius (Insecta: Coleoptera: Curculionidae)

<http://edis.ifas.ufl.edu/in139>

Royal Palm Bug, *Xylastodoris luteolus* Barber (Insecta: Hemiptera: Thaumastocoridae)

<http://edis.ifas.ufl.edu/in254>

Silky Cane Weevil, *Metamasius hemipterus sericeus* (Olivier) (Insecta: Coleoptera: Curculionidae)

<http://edis.ifas.ufl.edu/in210>