FLORIDA MASTER GARDENER

Palm Care Made Simple*

Dr. Pat Williams

* Not Really

UF | IFAS Extension
UNIVERSITY of FLORIDA

What is Extension?

- Is a **partnership** between Wakulla or Franklin County, the University of Florida, and the U.S. Dept. of Agriculture
- Uses university research and resources to address local needs through community initiatives, classes, outreach, and volunteer opportunities
- Provides practical education to help residents, professionals, decision-makers and others build a better future

Part I
Introduction to Palms

Palms Care Made Simple

1. Plant at correct depth
2. Fertilize on a regular schedule
3. Don’t over prune
4. Treat specimens like you want palms to be in Sarasota County in 20 years
5. No action is better than bad action
6. Monitor and act on problems

Sabal palmetto – Cabbage Palm
Florida’s state “tree”

Palms Are Florida

Palms Deserve Better Care

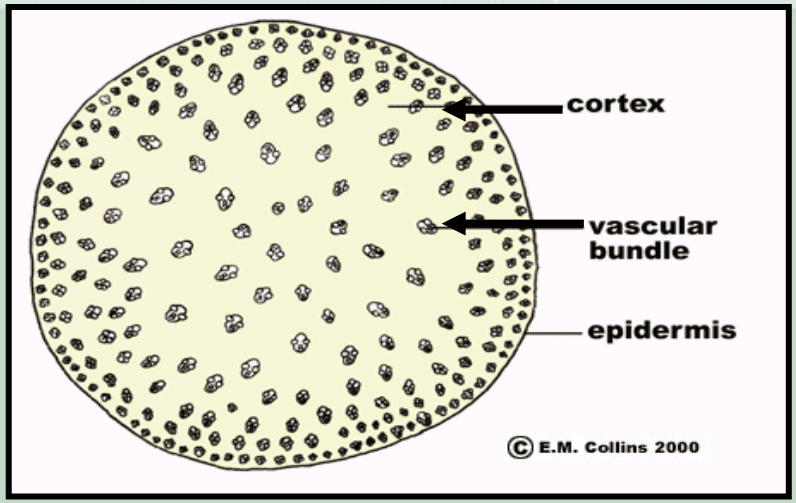
Palms are different!

- Morphology (external structure) and Anatomy (internal structure) are very different from broadleaf (dicot) trees.
- Unique nutritional needs
- Propagated from seed which can be slow and difficult with some species.
- Family: Arecaceae

Sabal palmetto – Cabbage Palm
Florida's state "tree"

Palm Anatomy

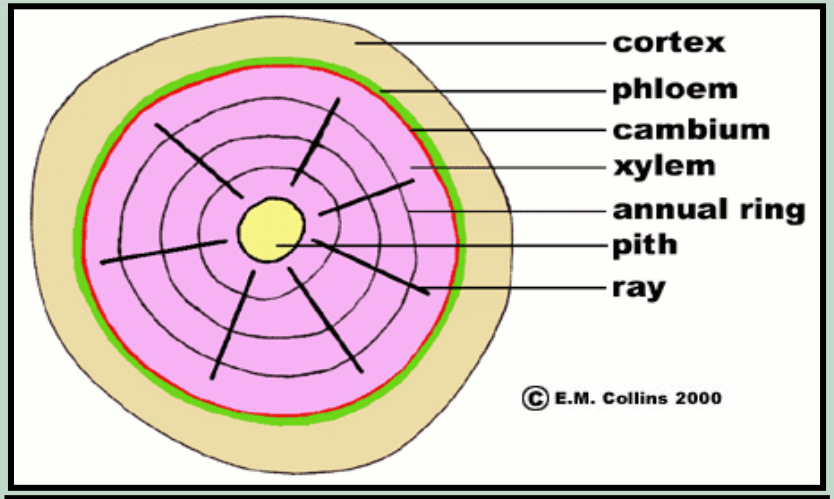
(monocot)



- have no vascular cambium
- xylem and phloem in same vascular bundle
- xylem and phloem tissue extend upward as trunk increases in height

Tree Anatomy

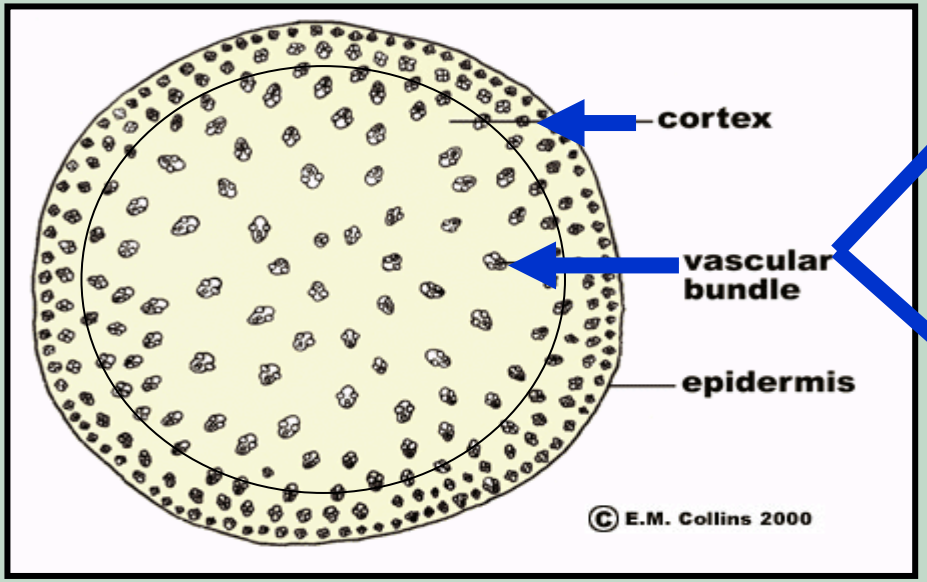
(dicot)

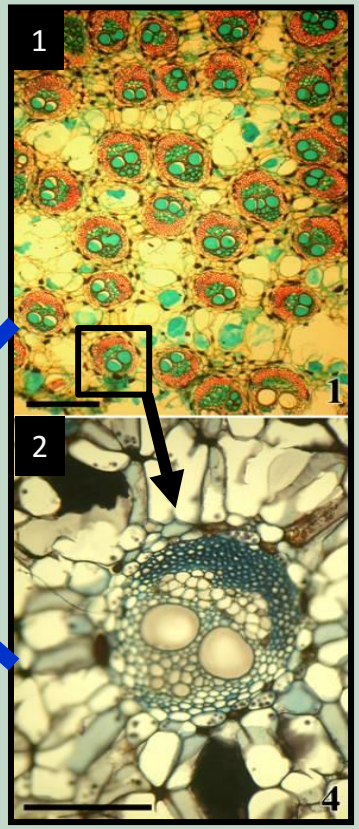


- have vascular cambium which produces xylem to inside and phloem to outside

Palm Vascular Bundle

- Xylem and phloem are together in *same* bundle
- Cortex has no bundles





Microscopic view of multiple palm vascular bundles

Microscopic view of single palm vascular bundle

J.B. Fisher, Fairchild Tropical Botanic Garden, with permission

Vascular Bundles in Stem

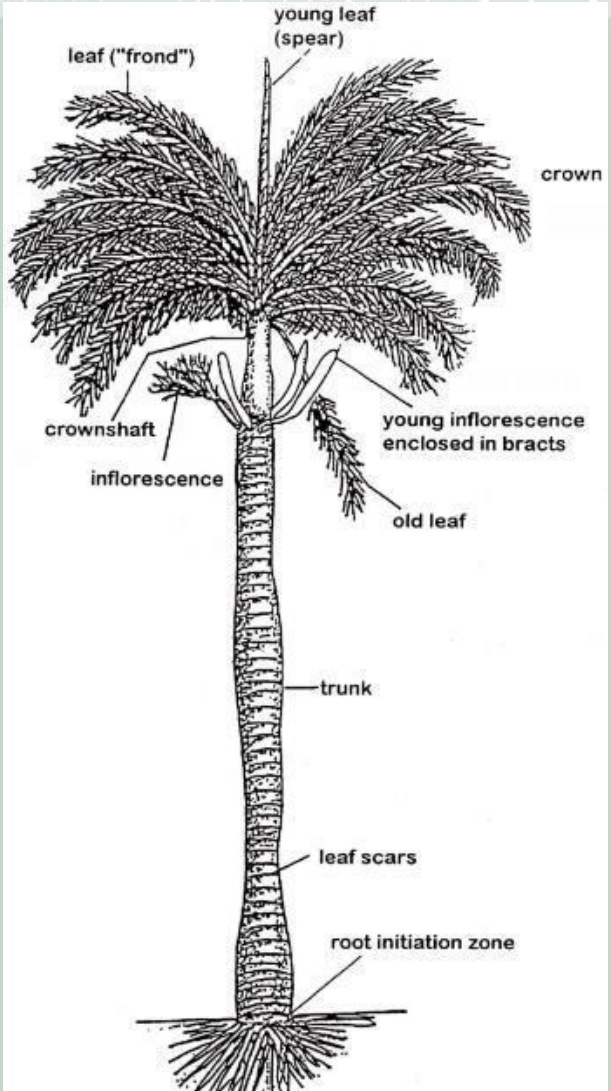
Phoenix roebelenii (Pygmy Date Palm)
Vascular bundles evenly distributed across the stem

Palm Morphology
(External Structure)

Feather palm with crownshaft

Fan palm without crownshaft

Palm Morphology
(External Structure)

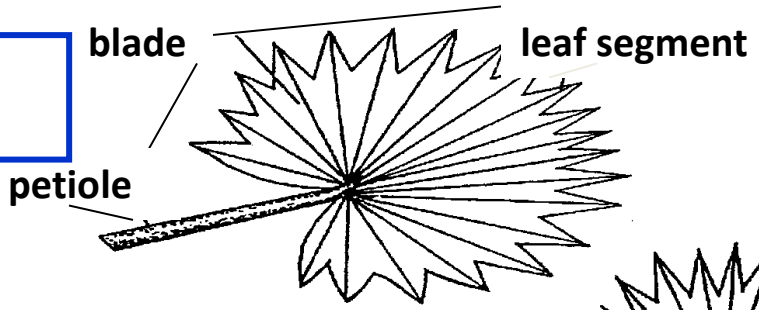


<u>Other Terms:</u>

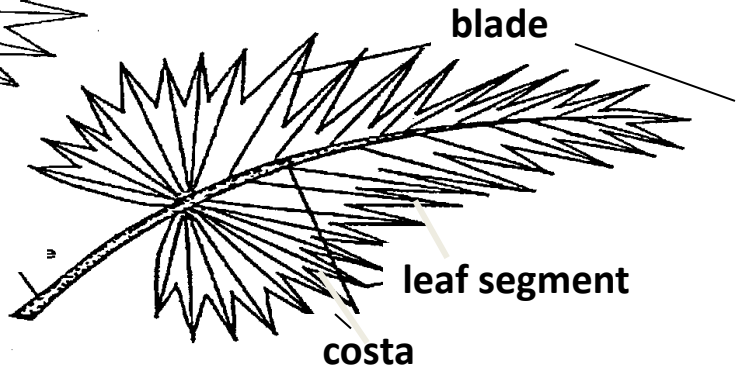
- Spear (new leaf)
- Frond (leaf)
- Inflorescence (flower stalk)
- Leaf scars (from old leaves)

Palm Morphology

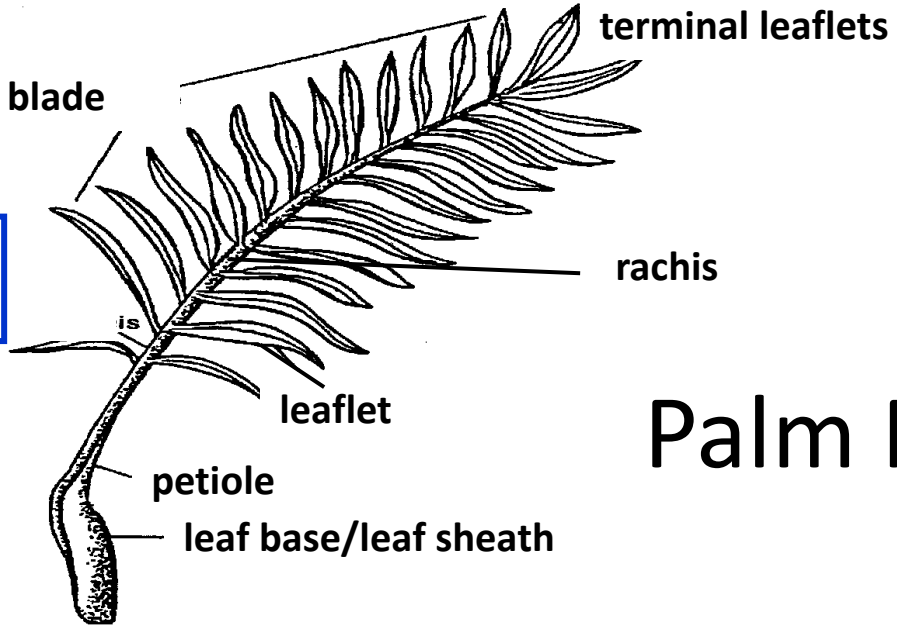
Palmate leaf
(Fan palms)



Costapalmate leaf
(Sabal palm)



Pinnate leaf
(Date palm)



Palm Roots

- Large diameter roots at bottom
- Small, fine roots in top 6 inches

Palm Meristems

➢ Palms

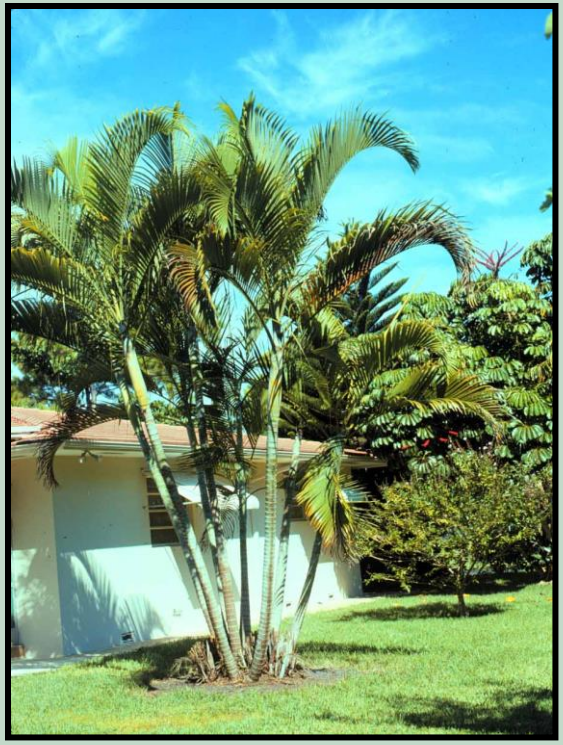
- one apical meristem (bud/heart) per stem
- lateral meristems only at base of clustering palm species
- exception: *Hyphaene* spp. have aerial branching

➢ Broadleaf Trees

- multiple apical meristems
- multiple lateral meristems (branching)

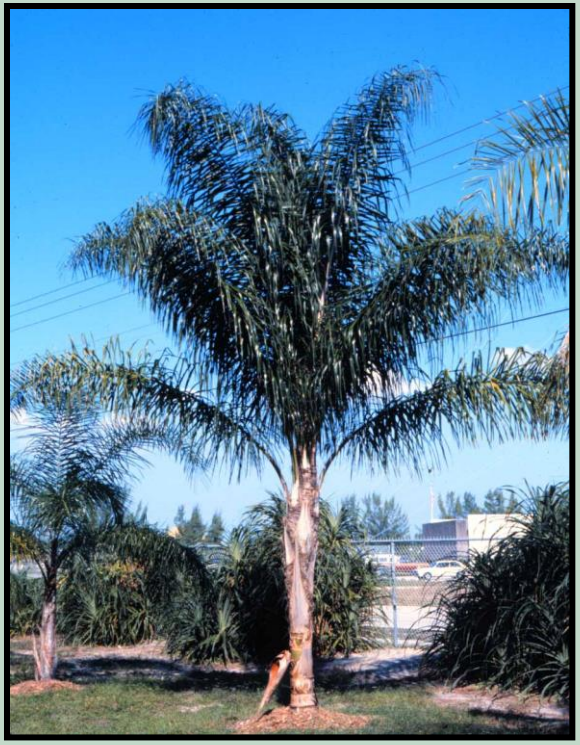
Palm Meristems

Clustering



Areca Palm

Single



Queen Palm

Multiple Singles Planted Together

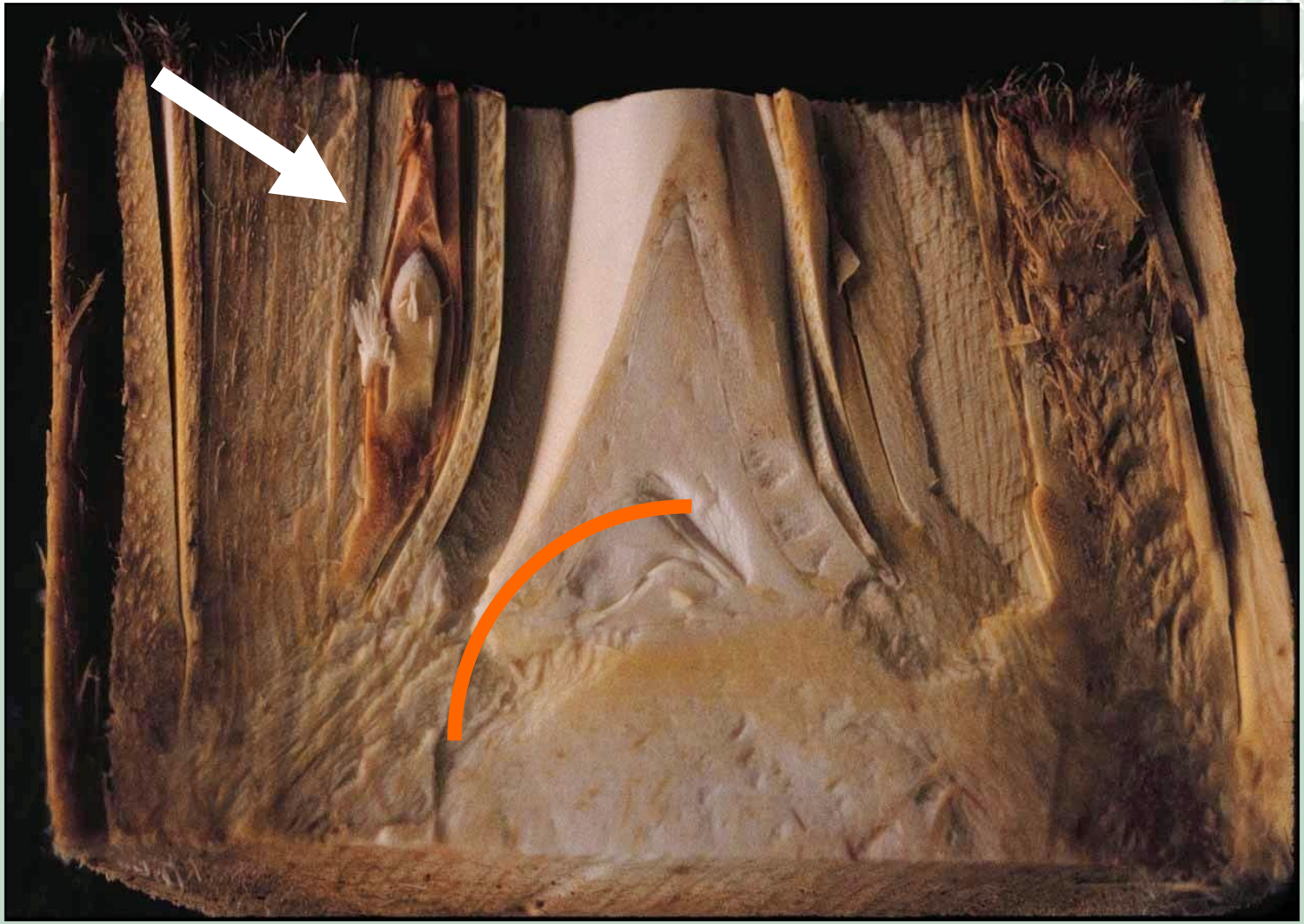
Christmas Palms

This is a *Hyphaene* sp. The above-ground branching is normal.

This is a cabbage palm (*Sabal* sp.). This branching is not normal.

Apical Meristem & Leaves

- Number of leaves produced and retained is function of species and environment, especially nutrition
- In general, for every visible leaf, an equal number of leaves are in development in the apical meristem (bud or heart)
- Damage to apical meristem (bud) affects leaves that will emerge later



Longitudinal cross-section through bud

Inflorescences and Fruits

- Three locations:
  - terminal – above canopy
  - within canopy, in leaf axil
  - below crownshaft
- Two types:
  - hapaxanthic – flowers and then palm dies (monocarpic)
  - pleonanthic – flowers repeatedly

Corypha elata: terminal (palm dies after flowering)

Cocos nucifera: within canopy

Carpentaria acuminata: below crownshaft

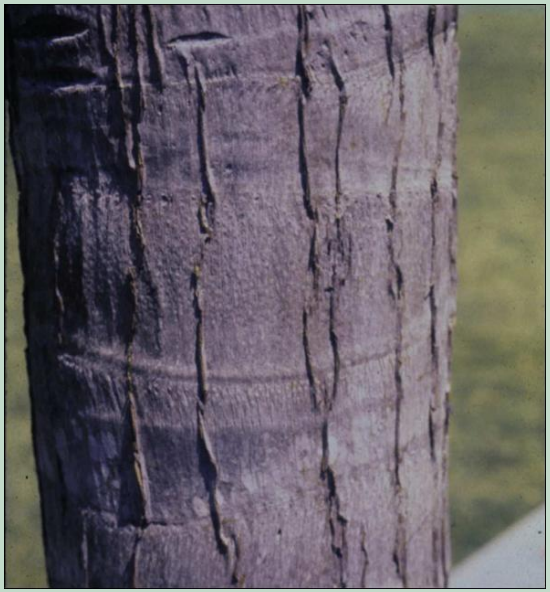
Part II
Planting/Transplanting Palms

Planting/Transplanting

- Plant at the same level palm was growing in the field or container.

Palms are often planted too deeply!

Washingtonia planted at varying depths to achieve a uniform height. At least one palm is dying from deep planting.



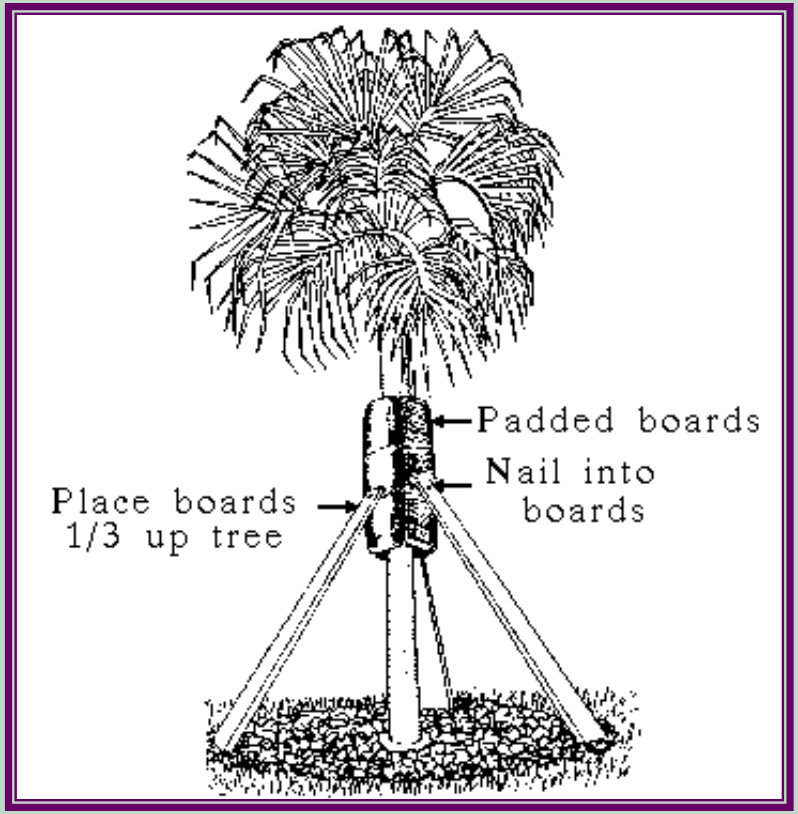
Shriveling of trunk and chlorotic leaves reflect root suffocation

Planting/Transplanting

- Build a water ring of soil over the root ball to hold irrigation and rain.

- Transplanting during the rainy season (June-November) increase rates of survival

Planting/Transplanting



Stake tall palms correctly; Never drive a nail into a palm trunk

- Water daily for 30 days.
- Keep rootball & surrounding backfill moist, but not saturated for 4-6 months after installation.
- May take up to one year to become fully established.

Part III
Fertilizing Palms

Nutritional Deficiencies

- A deficient leaf will remain that way until it dies or is pruned.
- Correction requires growth of new non-deficient leaves.
- It may take 3 years to replace canopy.
- Goal is *prevention* of deficiencies.

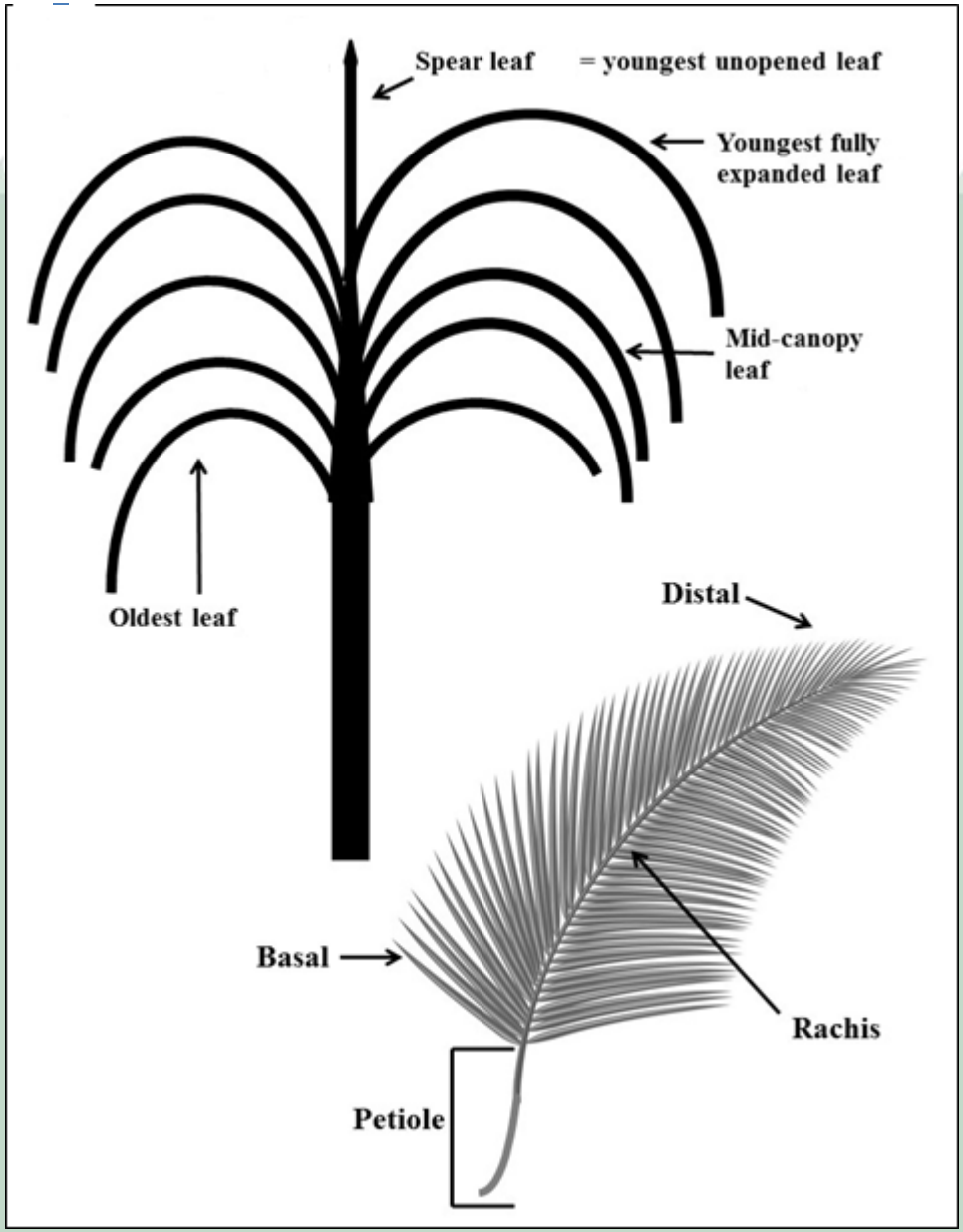
Common Nutritional Deficiencies

Potassium (K)

Magnesium (Mg)

Manganese (Mn)

Boron (B)



- Macronutrient: plant needs large amount (K, Mg)
- Micronutrient: plant needs small amount (Mn, B)
- Both are vital for plant health!

Potassium (K) Deficiency

- Most severe on *oldest* (lowest) leaves and toward tips (distal) of affected leaves
- Translucent yellow-orange or necrotic spotting of foliage
- Marginal and/or leaflet tip necrosis (brown due to death)

K Deficiency

Translucent yellow-orange spotting

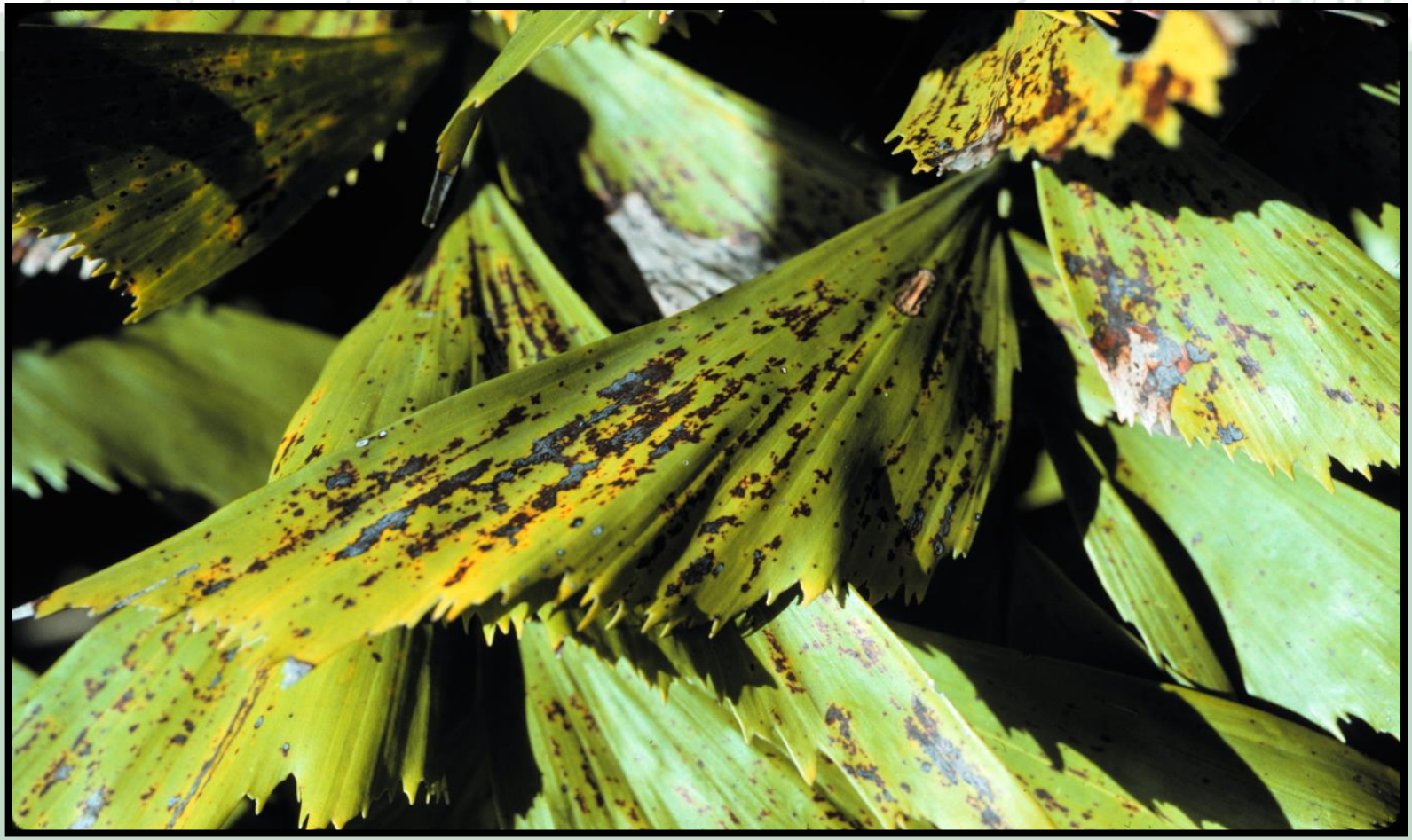
Easier to see if leaf is held up to light

K Deficiency

Marginal and tip necrosis on fan palm leaf

Necrosis of leaflet tips of feather palm

K Deficiency



Necrotic spotting of leaflets

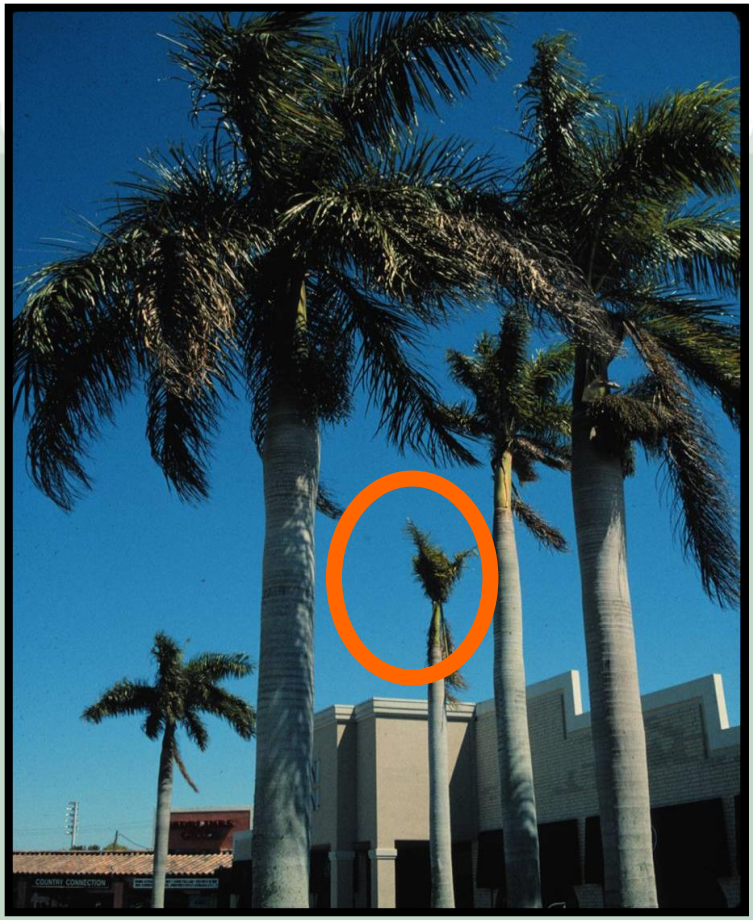
K Deficiency

- Most severe on oldest leaves
- Most severe on leaf tip, decreasing toward leaf base
- Leaf rachis remains green; is the last leaf part to become necrotic

Natural senescence occurs within a few days

K deficiency leaves linger in half dead state for weeks and months

K is a mobile element



Other K deficiency symptoms:

- trunk tapering (pencil pointing)
- fewer leaves in canopy than normal for that palm species

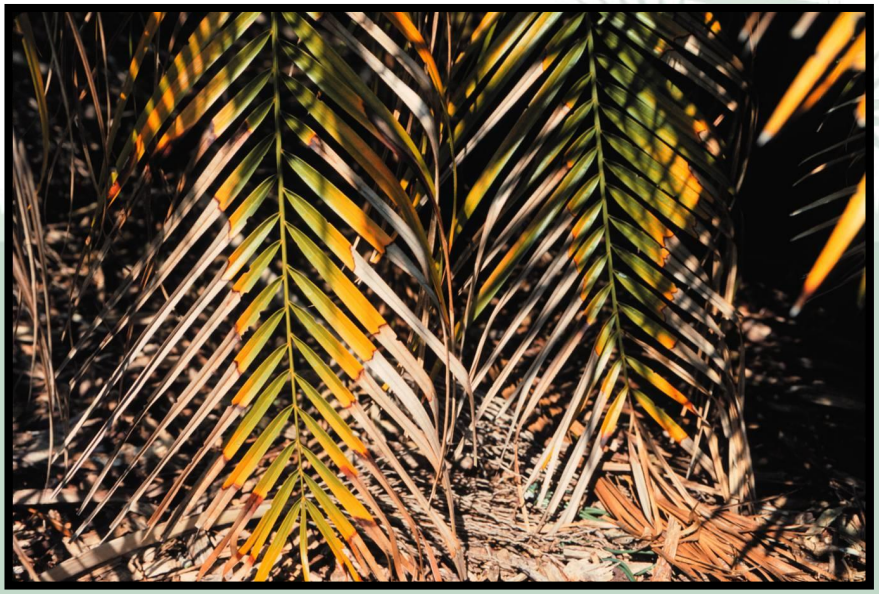
Florida soils are naturally deficient in K, *but* K deficiency is often induced by improper fertilization.

Magnesium (Mg) Deficiency

- Most severe on *oldest* (lowest) leaves
- Marginal chlorosis (yellowing) of leaflets or leaves
- Central part of leaflets or leaf segments remain distinctly green
- No necrosis of leaf tissue

Mg: yellow margins

K: brown margins



Mg: yellow margins

K: brown margins

- Mg deficiency occurs naturally primarily on *Phoenix canariensis* (Canary Island Date Palm)
- Mg deficiency induced on most other palms by improper fertilization

Palm with Mg *and* K Deficiencies

Extreme example of Mg *and* K deficiencies.

Manganese (Mn) Deficiency

- Affects *youngest* leaves only and more severe at leaf base than leaf tip
- Interveinal chlorosis with necrotic streaking
- Withering or frizzling of leaflet or leaf segment tips
- Death of apical meristem (bud)

Manganese (Mn) Deficiency

- Interveinal chlorosis *and* necrosis
- More common on feather-leaf palms

Manganese (Mn) Deficiency

- Youngest leaves are affected
- Leaflets closest to trunk are affected
- Opposite of K deficiency

Manganese (Mn) Deficiency

"Frizzletop" = Mn deficiency
Meristem (bud) is killed

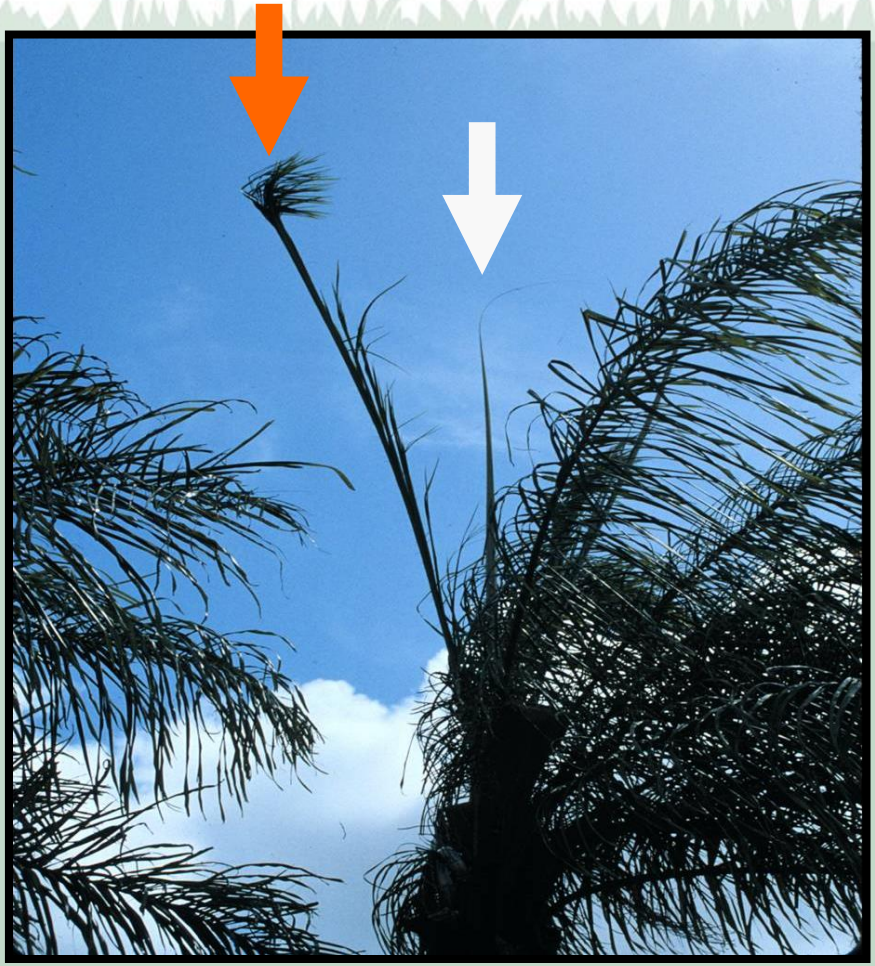
Queen palm with
Mn *and* K deficiencies

Boron (B) Deficiency

- Affects *newest* leaves
- Stunted new leaves
- Multiple, incompletely-opened spear leaves
- “Accordion” leaf symptoms
- Abortion of flowers and fruits
- Horizontal growth
- Death of meristem (bud)

Boron (B) Deficiency

Multiple, unopened new leaves



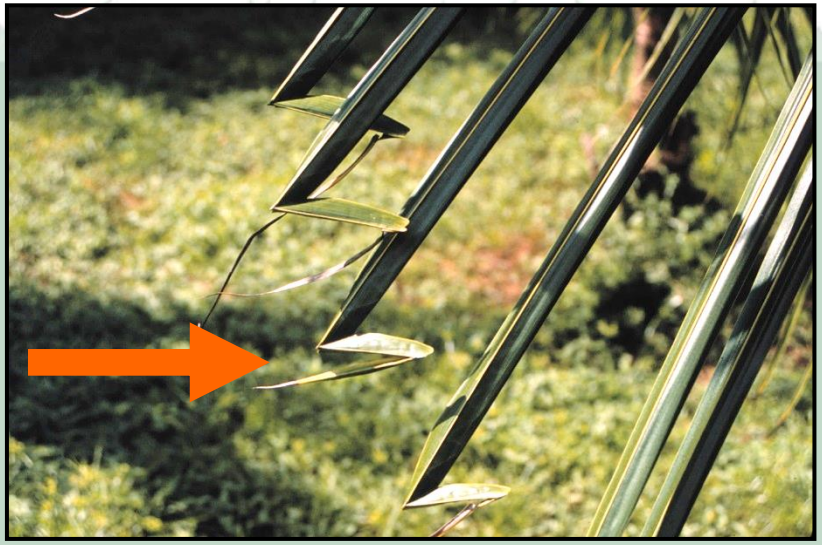
Spear leaf doesn't open completely

Boron (B) Deficiency

"Accordion" leaf symptom

Symptom remains until leaf naturally dies or until palm dies

Boron (B) Deficiency



Boron (B) Deficiency

Horizontal growth

Palm will grow upright again if boron deficiency is corrected, but it takes years

Causes of Deficiencies

- Insufficient nutrients in the soil
- Nutrients unavailable due to:
  - pH
  - Phosphates or organic matter (some sewage-based fertilizers)
- Nutrient imbalance

Induced Mn deficiency from Milorganite

Induced Mn deficiency from too much N

Induced Mn deficiency from too much N

Importance of Balanced Fertilizers

K Deficiency

Induced Mg Deficiency

Fertilization of Palms

- For common nutrient deficiencies of palms (K, Mg, Mn, B), application of the appropriate fertilizer will *NOT* correct the leaf symptoms already present.

- Fertilization is targeted at new leaves developing in the bud and emerging.

Again, fertilizer will *NOT* correct these symptoms! They will remain until affected leaves die naturally or are pruned.

Fertilizing Mixed Landscapes

Common Deficiencies

- Turf: N, Fe
- Broadleaf Trees and Shrubs: N, Fe, Mg, K, Mn
- Palms: N, Fe, Mg, K, Mn, B

Palm deficiencies include all of the turf and broadleaf trees and shrubs deficiencies

An Integrated Approach to Fertilizing Landscapes

- All types of plants are growing in the same deficient soil.
- Palm and tree roots coexist with turf roots.
- Products applied to turf can be harmful to palms and trees.
- Simplify fertilization.

An Effective Palm Fertilization Program

Fertilizer must:

- have appropriate ratio of N:K:Mg (2:3:1)
- contain correct components; must release at the same rate
- be applied correctly
- be applied in adequate amounts

If you can't use the correct fertilizer, it is better to use no fertilizer at all near palms!

Fertilizing Landscape Palms

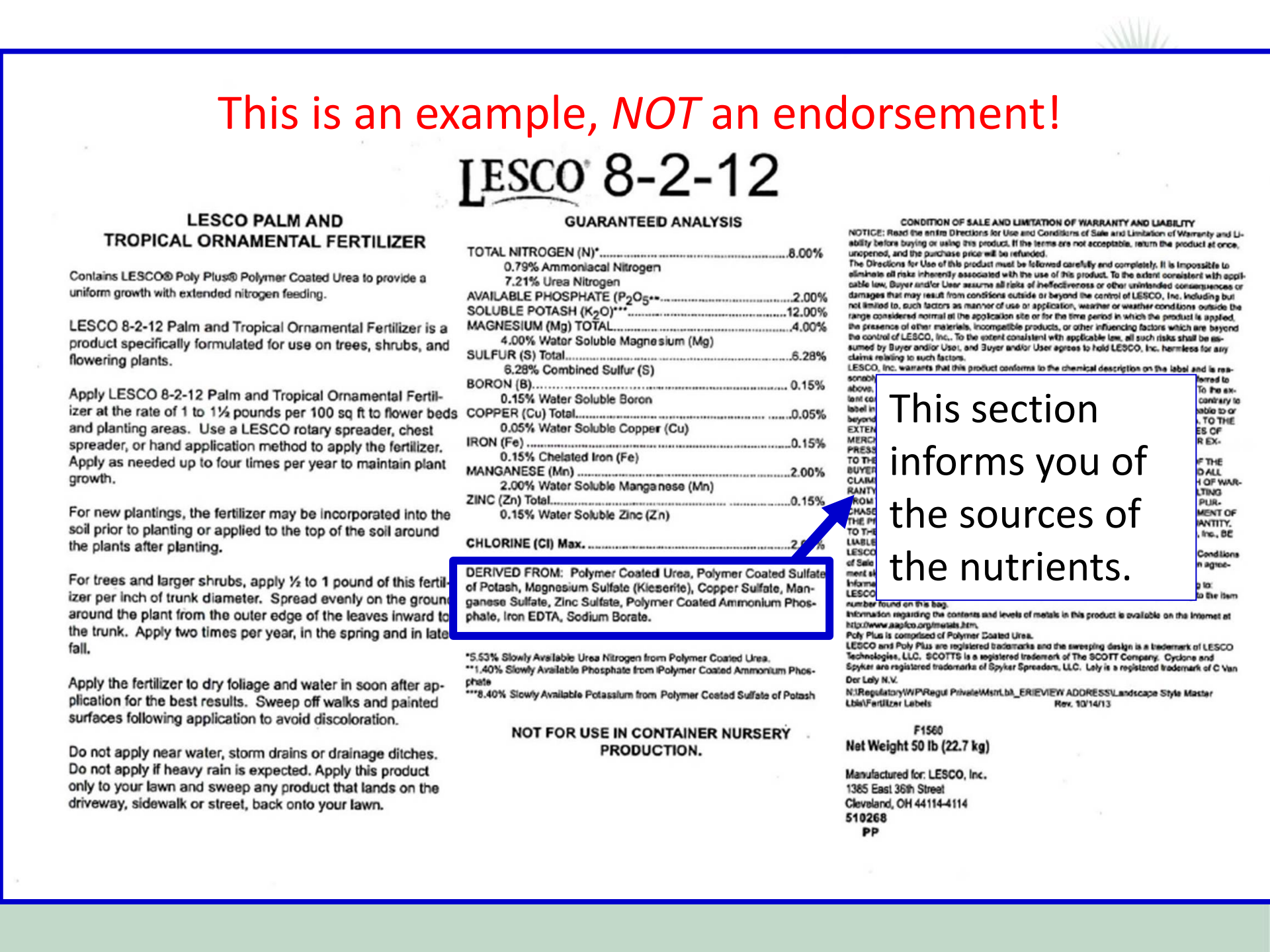
- Nutrient ratio of 2N:3K:1Mg:
  - Use 8-2-12-4Mg with micronutrients or 8-0-12-4Mg with micronutrients
- Type of materials are important:
  - N, K, Mg, B are in 100% controlled release form
  - Nutrients release at relatively the same rate over 3 months
  - Mn should be a sulfate, as should be Cu and Zn
  - Fe should be a chelate

Palm Fertilizers Are *NOT* Created Equal!
http://edis.ifas.ufl.edu/ep516

Where to find 8-2-12-4Mg?

- Most 8-2-12-4Mg are only available to professionals.
- Not all 8-2-12-4Mg fertilizers are the same!
- Make sure the nutrient sources are correct:
  - 100% control-release sources of N, K and Mg.
  - All of the K is present as polymer coated sulfate of potash.
  - All of the Mg magnesium sulfate in the form of kieserite.

This is an example, *NOT* an endorsement!



LESCO 8-2-12

LESCO PALM AND TROPICAL ORNAMENTAL FERTILIZER

Contains LESCO® Poly Plus® Polymer Coated Urea to provide a uniform growth with extended nitrogen feeding.

LESCO 8-2-12 Palm and Tropical Ornamental Fertilizer is a product specifically formulated for use on trees, shrubs, and flowering plants.

Apply LESCO 8-2-12 Palm and Tropical Ornamental Fertilizer at the rate of 1 to 1½ pounds per 100 sq ft to flower beds and planting areas. Use a LESCO rotary spreader, chest spreader, or hand application method to apply the fertilizer. Apply as needed up to four times per year to maintain plant growth.

For new plantings, the fertilizer may be incorporated into the soil prior to planting or applied to the top of the soil around the plants after planting.

For trees and larger shrubs, apply ½ to 1 pound of this fertilizer per inch of trunk diameter. Spread evenly on the ground around the plant from the outer edge of the leaves inward to the trunk. Apply two times per year, in the spring and in late fall.

Apply the fertilizer to dry foliage and water in soon after application for the best results. Sweep off walks and painted surfaces following application to avoid discoloration.

Do not apply near water, storm drains or drainage ditches. Do not apply if heavy rain is expected. Apply this product only to your lawn and sweep any product that lands on the driveway, sidewalk or street, back onto your lawn.

GUARANTEED ANALYSIS

TOTAL NITROGEN (N)*	8.00%
0.79% Ammoniacal Nitrogen	
7.21% Urea Nitrogen	
AVAILABLE PHOSPHATE (P_2O_5**)	2.00%
SOLUBLE POTASH (K_2O)***	12.00%
MAGNESIUM (Mg) TOTAL	4.00%
4.00% Water Soluble Magnesium (Mg)	
SULFUR (S) Total	6.28%
6.28% Combined Sulfur (S)	
BORON (B)	0.15%
0.15% Water Soluble Boron	
COPPER (Cu) Total	0.05%
0.05% Water Soluble Copper (Cu)	
IRON (Fe)	0.15%
0.15% Chelated Iron (Fe)	
MANGANESE (Mn)	2.00%
2.00% Water Soluble Manganese (Mn)	
ZINC (Zn) Total	0.15%
0.15% Water Soluble Zinc (Zn)	
CHLORINE (Cl) Max.	2.0%

DERIVED FROM: Polymer Coated Urea, Polymer Coated Sulfate of Potash, Magnesium Sulfate (Kieserite), Copper Sulfate, Manganese Sulfate, Zinc Sulfate, Polymer Coated Ammonium Phosphate, Iron EDTA, Sodium Borate.

*5.53% Slowly Available Urea Nitrogen from Polymer Coated Urea.
**1.40% Slowly Available Phosphate from Polymer Coated Ammonium Phosphate
***8.40% Slowly Available Potassium from Polymer Coated Sulfate of Potash

NOT FOR USE IN CONTAINER NURSERY PRODUCTION.

CONDITION OF SALE AND LIMITATION OF WARRANTY AND LIABILITY

NOTICE: Read the entire Directions for Use and Conditions of Sale and Limitation of Warranty and Liability before buying or using this product. If the terms are not acceptable, return the product at once, unopened, and the purchase price will be refunded.

The Directions for Use of this product must be followed carefully and completely. It is impossible to eliminate all risks inherently associated with the use of this product. To the extent consistent with applicable law, Buyer and/or User assume all risks of ineffectiveness or other unintended consequences or damages that may result from conditions outside or beyond the control of LESCO, Inc. including but not limited to, such factors as manner of use or application, weather or weather conditions outside the range considered normal at the application site or for the time period in which the product is applied, the presence of other materials, incompatible products, or other influencing factors which are beyond the control of LESCO, Inc.. To the extent consistent with applicable law, all such risks shall be assumed by Buyer and/or User, and Buyer and/or User agrees to hold LESCO, Inc. harmless for any claims relating to such factors.

LESCO, Inc. warrants that this product conforms to the chemical description on the label and is reasonab[illegible] above. [illegible] To the extent consistent with applicable law, Buyer and/or User assume all risks of ineffectiveness or other unintended consequences or damages that may result from conditions outside or beyond the control of LESCO, Inc. including but not limited to, such factors as manner of use or application, weather or weather conditions outside the range considered normal at the application site or for the time period in which the product is applied, the presence of other materials, incompatible products, or other influencing factors which are beyond the control of LESCO, Inc.. To the extent consistent with applicable law, all such risks shall be assumed by Buyer and/or User, and Buyer and/or User agrees to hold LESCO, Inc. harmless for any claims relating to such factors.

number found on this bag.

Information regarding the contents and levels of metals in this product is available on the Internet at http://www.aapfco.org/metals.htm.

Poly Plus is comprised of Polymer Coated Urea.

LESCO and Poly Plus are registered trademarks and the sweeping design is a trademark of LESCO Technologies, LLC. SCOTTS is a registered trademark of The SCOTT Company. Cyclone and Spyker are registered trademarks of Spyker Spreaders, LLC. Lely is a registered trademark of C Van Der Lely N.V.

N:\Regulatory\WP\Regul Private\Msm\Lbl_ERIE\VIEW ADDRESS\Landscape Style Master Lbls\Fertilizer Labels Rev. 10/14/13

F1560

Net Weight 50 lb (22.7 kg)

Manufactured for: LESCO, Inc.
1385 East 36th Street
Cleveland, OH 44114-4114
510268
PP

This section informs you of the sources of the nutrients.

Fertilizing Landscape Palms

- If you are requesting a bid or contract, be very specific regarding the fertilizer used in the landscape.
- When reviewing bids, be sure you are comparing an apple with an apple rather than an apple with an orange.

Fertilizing Landscape Palms

Use 8-2(0)-12-4Mg with micronutrients

- *Broadcast* 15 lbs fertilizer per 1000 sq. ft. of bed or canopy area every 3 months.

- Fertilize turf within 50 ft. of any palm (that's where palm roots are located).

Fertilizing Landscape Palms

- If you can't use the correct fertilizer, it is better to use no fertilizer at all near palms!
- Fertilizers are potential surface and ground water pollutants.
- Applying an ineffective fertilizer is a waste of money and time, and a source of water pollution.

Same soil – Good vs. Bad Fertilizer

These two palms were planted at the same time.
Which would you prefer to have in your landscape?

Fertilizing Landscape Palms

In areas with fertilizer restrictions…

- If P is prohibited year-round, use 8-0-12-4Mg (same rate)
- If N and P are prohibited in summer months, apply 8-2-12-4Mg in Feb, May, and Nov, but use 0-0-16-6Mg in Aug. (same rate)

Local fertilizer ordinances vary – Know yours!

An Effective Fertilization Program

(is more than just the right fertilizer)

- Application methods:
  - Broadcasting – best method!
  - Banding – no (only reaches some roots)
  - Fertigation – no (especially during rainy season)
  - Soil injection – no (placing below roots)

Examples of broadcast fertilizer spreaders

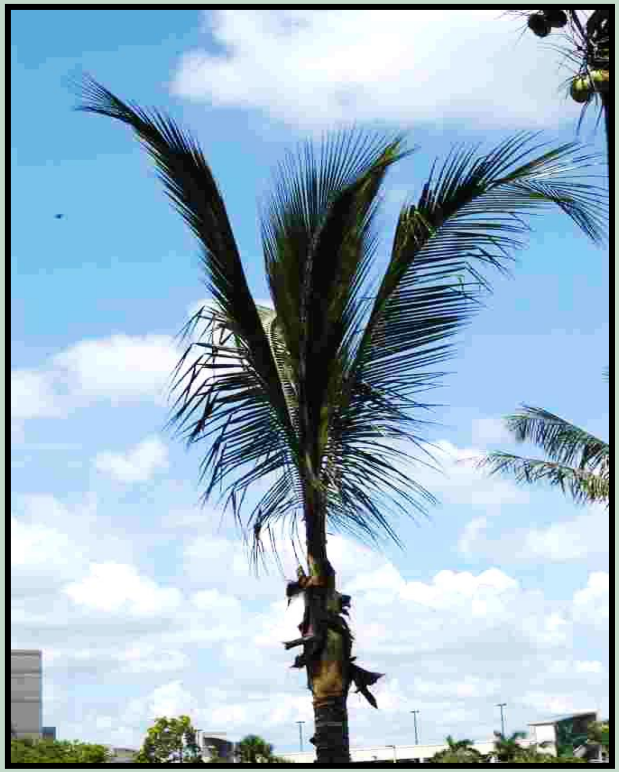
“Flinging” fertilizer by hand is not very accurate!

Induced K deficiency

Deficient soils can cause palm nutrient deficiencies, but most are due to improper fertilization – especially turf fertilizers with high N content

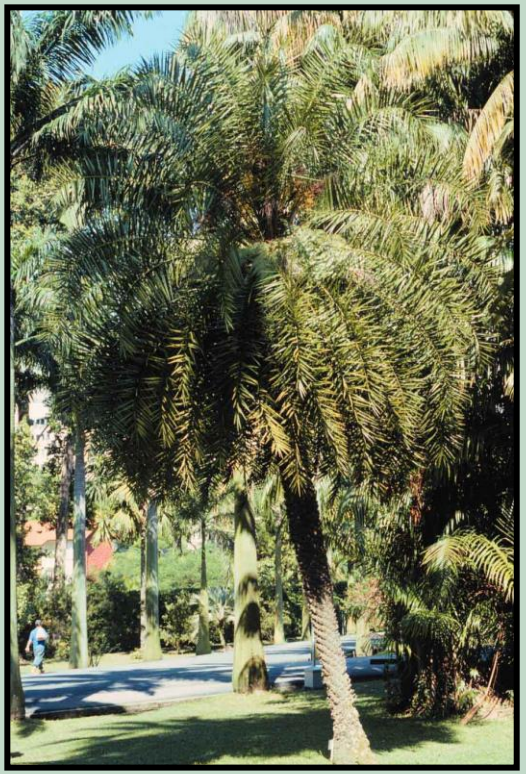
Part IV
Pruning Palms

Palm Pruning



The Good, The Bad, and The Ugly

Palms should have 360-degree canopies!



This can only be achieved with correct fertilization and pruning.

Excessive Pruning

- Affects:
  - vigor
  - nutritional health
  - cold hardiness
- Can transmit diseases

Palm Abuse!!

No words necessary…

Pineapple Cut

Palm Abuse!!

Fusarium Wilt

Trunk Rot Thielaviopsis

Palm Weevil

K and Mg Deficiencies

4 Reasons ***NOT*** to Excessively Prune Canary Island Date Palms

Pruning Palms

- If nutrient deficiencies exist, never remove any leaves that are not completely dead.
- If no deficiencies exist and palm has a full canopy (360 degree green fronds), remove no more healthy leaves than will be produced during the interval between prunings—and preferably less!
- N**ever** remove any living leaves originating above the horizontal plane (9:00 to 3:00 positions).

Pruning Palms

- Remove completely dead fronds, fruit and flower stalks.
- Can remove living flower or fruit stalks if desired.
- Hurricane cuts are not appropriate pruning techniques

Palm Pruning

Hurricane pruning: 10 : 2 or 11 : 1

Acceptable: 9 : 3

Palm Pruning:

R.O.B. – Remove Only Brown

Palm Pruning

R.O.B. – Remove Only Brown

Pruning Palms

- If leaves are partially damaged from the cold, they should stay on the palm until new leaves form.

What to remove?

- If deficiencies exist,
  remove only dead leaves
- ROB: Remove Only Brown
- If you must remove leaves,
  never remove above the horizontal
  (9:00 and 3:00 positions on a clock)
- Remove leaves causes damage to
  structures

What to remove?

“Hurricane Pruning” is a myth!

Over-pruned - before storm

Same palms - after storm

1 block away - after storm:

These palms were not trimmed before storm

What to remove?

- Dead leaves
- Badly damaged leaves
- Flower stalks
- Fruit stalks

Acceptable to trim flowers and fruits

How to remove?

- Cut leaf bases close, but not into trunk.
- Do not pull or tear leaves off.
- Sterilize tools between each palm, especially Canary Island Date Palms.

Part V
Key Pests of Palms and Cycads

Key Pests

Insects

- Palm Leaf Skeletonizer
- Palmetto Weevil
- Asian Cycad Scale
- Palm Aphid

Diseases

- Fusarium Wilts
- Ganoderma Butt Rot
- Phytoplasma Diseases
  - Lethal Yellowing
  - Lethal Bronzing (formerly TPPD -Texas Phoenix Palm Decline)

Palm Leaf Skeletonizer

- Small caterpillars feed on lower leaf surface
- Cover themselves with brown, fibrous frass

Management:

– Wash caterpillars off with water

– Prune out severe damage if desired

– Use *B.t.* or approved insecticides

Palmetto Weevil

Management

- Reduce transplant stress
- Preventative insecticide applications
- Remove and destroy infected palms

Asian Cycad Scale

- First appears as yellow spots
- Fronds brown and dry up
- Foliage completely coated with “white snow”
- Also attack roots

<u>Management</u>

- Regular, repeated sprays of Organocide®
- Remove fronds – or plant
- Parasitic wasps released
- Cycad scale does not attack palms

Palm Aphid

- Only aphid that attacks palms
- Atypical appearance; looks more like a scale than an aphid
- Common in S. FL; rare north of Lake Okeechobee

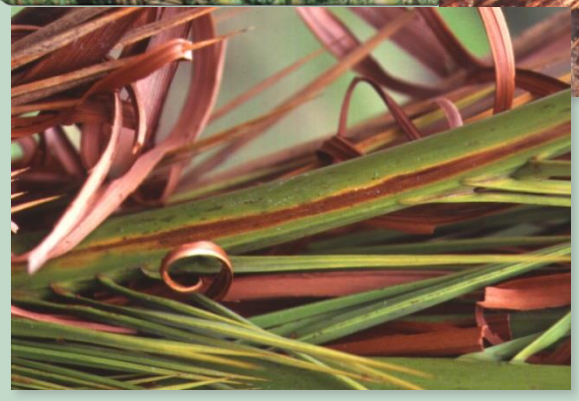
Adult Palm Aphid

Management

- Monitor palms for sooty mold and beneficial insects
- Horticultural Oil (if needed)

Sooty mold

Fusarium Wilt of Canary Island Date Palm



- One-sided decline of fronds
- Streaking of rachis
- Vascular discoloration
- Spreads through pruning and infested soil

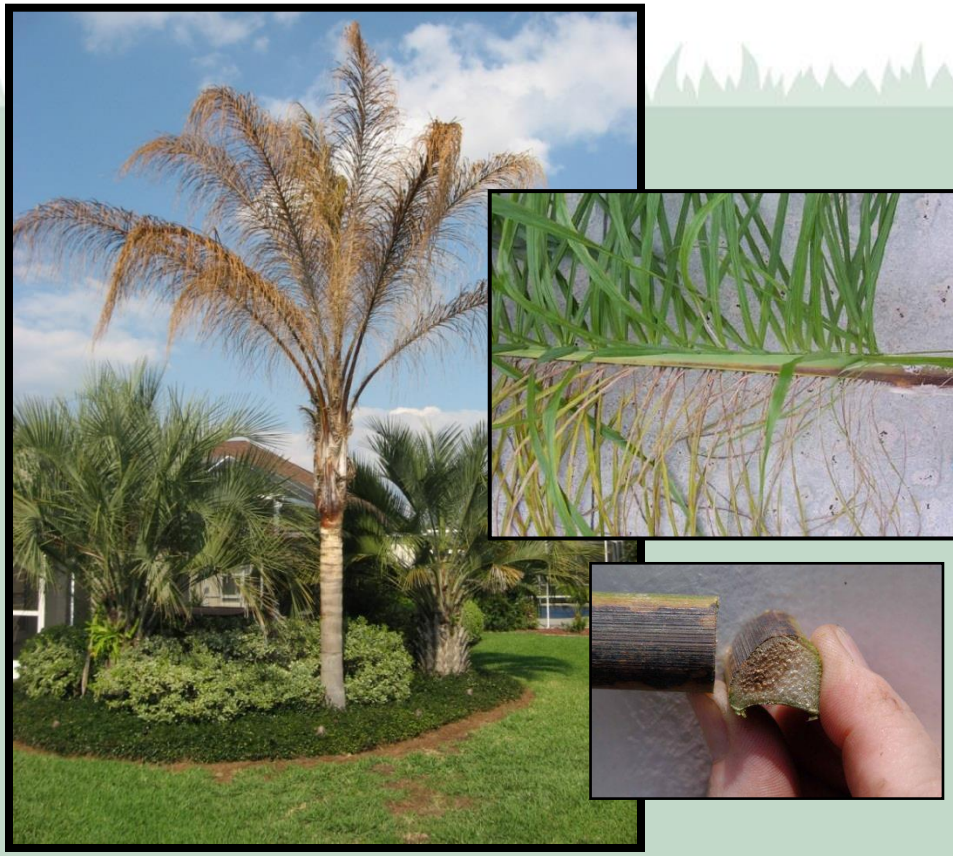
Management

Sterilize pruning tools

Remove and destroy palm (affected palms die, there is no treatment)

Do not replant with another Canary Island date palm without first removing and replacing soil.

Fusarium Wilt of Queen and Mexican Fan Palms



- Different Fusarium disease
- One-sided decline of fronds
- Streaking of rachis or petiole
- Vascular discoloration
- *Syagrus romanzoffiana* and *Washingtonia robusta* are susceptible
- Spreads primarily by wind-blown spores

Management

Sterilize pruning tools
Remove and destroy palm (affected palms die; there is no treatment)
Do not replant into the site with these two palm species

Ganoderma Butt Rot

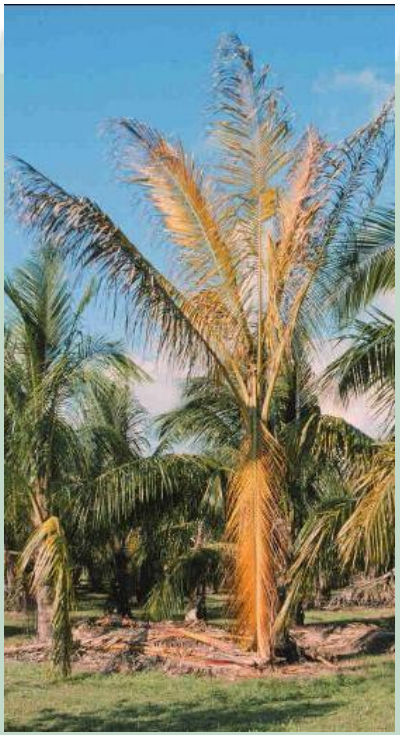
- Old fronds wither and droop; new fronds appear water-stressed.
- Shelf fungus may be present on trunk
- Fungus spread by spores produced in conks

Management

– All palms are susceptible
– No cultural or chemical controls
– Remove conks, stump, and roots
– Replant with a NON-palm species

Phytoplasma Diseases

Lethal Yellowing (LY) & Lethal Bronzing (formerly TPPD)



LY on Coconut Palm

Lethal Bronzing on Sabal and Phoenix Palms

- Fruits drop; flowers die (on mature palms)
- Lower leaves discolor (starting at tips) and die
- Spear leaf dies

Management

Remove and destroy palm
Prevent with antibiotic trunk injections
Plant less susceptible or non-susceptible palms

Focus on what you can control!

- Nutrition - fertilize by broadcasting the best available palm fertilizer
- Prune correctly - don’t abuse your palms; sterilize pruning tools
- There is no perfect palm!
- Diversify your landscape!

Acknowledgements

- UF/IFAS Extension Faculty:
  - Dr. Monica Elliott
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Part VI - Common Palms
(in our region)

Common Palms in Local Landscapes

Instructors, the following slides provide info on some of the many palm species found in the state.
For this portion of the Palm module, select species that are common in landscapes in your area and add others as you see fit.

See:
Fact Sheets - Commonly Cultivated Palms
http://idtools.org/id/palms/palmid/factsheet_index.php

EDIS-Palm Varieties
https://edis.ifas.ufl.edu/topic_palm_trees

Areca Palm

Dypsis lutescens

- Native to Madagascar
- Likes full to light partial sun
- Grows to 30’
- High drought tolerance
- Moderate salt tolerance
- Clumping; used as hedging, shrub or specimen
- Highly susceptible to K deficiency
- Insect problems: caterpillars, mealybugs and banana moth

Bamboo Palm

Chamaedorea seifrizii

- Native to Mexico and Central America
- Part sun to shade
- Cold tolerant
- Grows slowly to 7-12’
- Orange flower stalks; black seeds
- Insects: Mites, mealybugs, & scales
- Gliocladium, and Blight (pink rot)
- Seed germination time: 6+ months

Bismarck Palm

Bismarckia nobilis

- Native to Madagascar
- Robust; 40 feet' tall
- Full sun and well drained soil
- Highly drought tolerant
- Use: Specimen or focal point
- Does not transplant well until it has 4' of trunk
- Palmetto weevils have become a recent problem

Canary Island Date Palm

Phoenix canariensis

- Native to the Canary Islands
- Full sun
- To 60’
- Susceptible to K and Mg deficiencies
- Major insect: Palmetto weevil
- Diseases: Several severe
- Seed germination time: 1-2 months

Carpentaria Palm

Carpentaria acuminatta

- Native to Australia
- Full sun
- Rapid grower to 40’
- Solitary; best if planted in groups
- Seed germination time: 6 weeks +/-
- Short-lived with a lifespan of 40 years

Cat Palm

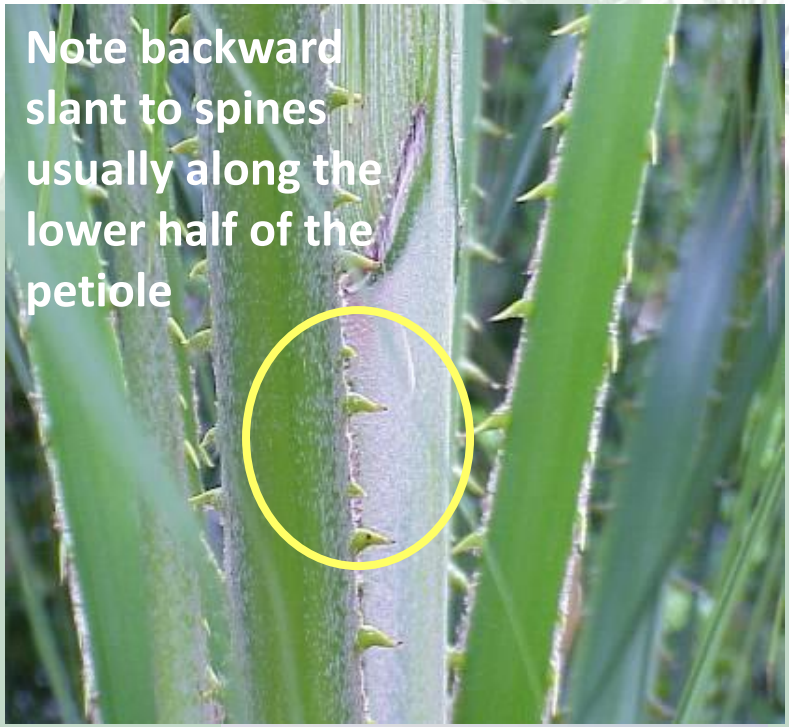
Chamaedorea cataractarum

- Native to Southern Mexico
- Part sun to shade
- Height: ~6’
- Low salt and moderate drought tolerance in shade.
- Flowers yellow; ripe fruit black
- Slightly susceptible to mealybugs, banana moth larvae, and mites (indoors).
- Propagated by seed; germination takes several months

Chinese Fan Palm

Livistona chinensis

- Native to China and Southern Japan
- No major insect problems
- Fruits: blue-green; ¾-1”
- Full to partial sun; can be grown indoors
- Grows slowly to 40’
- Tolerates poor soil



Christmas Palm

Adonidia merrillii

- Native to the Philippines
- Full to part sun
- Grows to 20’
- High drought & moderate salt tolerance
- Solitary palm often planted in clumps
- Bright red fruits ripen around Christmas
- Insects: no major problems
- Diseases: very susceptible to Lethal Yellowing
- Propagation: seed; germinates in 1-2 months

Coconut Palm

Cocos nucifera

- Native to the Pacific Islands
- Full sun
- High drought and salt tolerance
- Height: 50-80’ depending on variety
- Immature fruit and petioles golden, green or bronze. Mature fruit brown.
- Insects: Palm aphids and coconut mites
- Diseases: All cultivars are susceptible to Lethal Yellowing.
- K deficiency is common.
- **One of the world’s most economically important plants**
- **Invasive in S. FL, caution in C. FL**

Date Palm

Phoenix dactylifera

- Native to Near East
- Full sun, well-drained soil, high drought and salt tolerance
- Grows slowly to 70’
- Fruit golden when ripe and edible when dried
- Major insects: scales, especially the red date scale
- Major diseases: Stigmina leaf spot, Graphiola false smut, phytoplasma diseases-especially Lethal Bronzing
- Not grown as a food crop in Florida due to high humidity

European Fan Palm

Chamaerops humilis

- Native to the Mediterranean
- Full to part sun; indoors in very high light
- High drought and salt tolerance
- Cold tolerant
- Clumping; Grows slowly to 20’
- Problems: Banana moth larvae and K deficiency
- This palm often dies without a known cause

Fishtail Palm

Caryota mitis

- Native to Southeast Asia
- Full to partial sun
- Clumping; 25 to 30’. Can be grown indoors.
- Ripe fruit is dark red to black, then stem dies
- Fronds and fruit contain calcium oxalate crystals - irritating to skin and eyes.
- No noted pest problems; sensitive to fungal leaf spots.

Florida Thatch Palm

Thrinax radiata

- Native to S. Florida and Caribbean
- Partial to full sun
- Grows slowly to 20’
- High drought and salt tolerance
- Flowers and ripe fruit are white
- No major disease or pest problems
- Seed germination time: 2–3 months

Foxtail Palm

Wodyetia bifurcata

- Native to Australia
- Fluffy fronds-like a fox tail
- Full sun; not adapted to alkaline soils
- Grows rapidly to 40’
- Moderate salt & drought tolerance
- No major pest problems
- Prone to iron, manganese, and potassium deficiencies
- Susceptible to leaf spot if over-watered
- Seed germination time: 2-3 months

Hurricane or Princess Palm

Dictyosperma album

- Native to Mascarene Islands
- Full sun; moderate salt and high drought tolerance
- Rapid grower to 30’ with a solitary trunk
- Problems: K and Mg deficiency
- Creamy yellow blooms; ripe fruit is purple-black

Lady Palm

Rhapis excelsa

- Native to southern China
- Likes shade to part sun
- Clumping; Grows to 10’
- High drought and moderate salt tolerance
- Susceptible to Fe and Mn deficiencies
- No major insect or disease problems
- Seed germination time: 6+ months; Can be divided

Majesty Palm

Ravenea glauca or R. rivularis

- Native to Madagascar
- Full to partial sun
- *R. glauca* – 15 to 20’
  R. rivularis – 60 to 80’
- Can be used as an understory palm
- Fruit red when ripe
- Insects: Silky cane weevils
- Diseases: None major
- Seed germination time: 2-3 months

Montgomery Palm

Veitchia arecina

- Native to the New Hebrides Isles
- Likes full to partial sun
- Grows to 50’
- Moderate salt and drought tolerance
- Flowers white; ripe fruit is red
- No major pest problems
- Propagation is by seed; germinate in 1-2 months

This palm has the most compact canopy with a smaller number of leaves and broader leaflets than other Veitchia species.

Needle Palm

Rhapidophyllum hystrix

- Native to Florida
- Like part sun
- Grows to 8-10’ tall and wide
- Extremely drought tolerant
- No pest problems of note
- Spines at the base of the plant
- Clumping; trunk short and thick

Note palmate fronds

Paurotis Palm

Acoelorrhaphe wrightii

- AKA Everglades Palm
- Native to FL and Caribbean
- Likes full to part sun and moist soil; poorly adapted to alkaline soils; Mn deficiency
- Clumping palm; grows to 20’
- White flower; orange-black when ripe
- No major pest problems
- Disease problems: Stigmina leaf spot, Graphiola false smut

- Seed germination time: 2-3 months; can be divided

Pindo/Jelly Palm

Butia odorata

- Native to S. America
- Full sun
- Slow-growing to 15-20’
- Gray-green fronds; edible yellow-orange fruit
- Single, knobby trunk
- Cold tolerant; intolerant of salt spray
- Susceptible to Mn deficiency

Pygmy Date Palm

Phoenix roebelenii

- Native to SE Asia
- Full to part sun
- Grows slowly to 12-15’
- Low salt; high drought tolerance
- Naturally a solitary palm; sold as clusters in the trade
- Prone to Mn and Mg deficiencies
- No major pest problems
- Diseases: Pestalotiopsis leaf spot

Queen Palm

Syagrus romanzoffiana

- Native to S. Brazil and Argentina
- Full sun
- Grows rapidly to 40’
- Moderate salt; high drought tolerance
- Flower creamy white; ripe fruit is yellow to orange.
- Problems: Fusarium wilt; susceptible K and Mn deficiency (Frizzletop)
- Seed germination time: 3-6 months
- Poorly adapted to high winds/hurricanes
- Invasive in N,C,S FL

Sabal Palm/Cabbage Palm

Sabal palmetto

- Native to SE United States
- Full sun
- Grows slowly to 40’
- Drought tolerant; tolerant of salt spray but not salts in the soil
- State tree of both FL and S. Carolina
- Transplants easily but-only if leaves are removed at time of digging
- Diseases: Lethal Bronzing
- Seed germination time: 2-3 months

Saw Palmetto

Serenoa repens

Silver form

- Florida native
- Full to part sun
- High drought and fire tolerance
- Grows slowly and forms thickets
- Extremely cold tolerant
- No noted pest or disease problems
- Stem (trunk) is mostly under-ground making it difficult to transplant

Solitaire Palm

Ptychosperma elegans

- Native to Australia
- Full to partial sun
- Grows to 20’
- Low salt and moderate drought tolerance
- White flowers; red ripe fruit
- Pests: scale, palm aphids and mites
- Seed germination time: 2 months

Spindle Palm

Hyophorbe verschaffeltii

- Native to Rodrigues Island (Mascarenes)
- Full sun
- Grows slowly to 20’ and has a high salt and moderate drought tolerance.
- Flowers are cream-colored; ripe fruit is orange to red
- Silky Cane Weevil susceptible
- K deficiency
- Seed germination time: 3-6 months

Triangle Palm

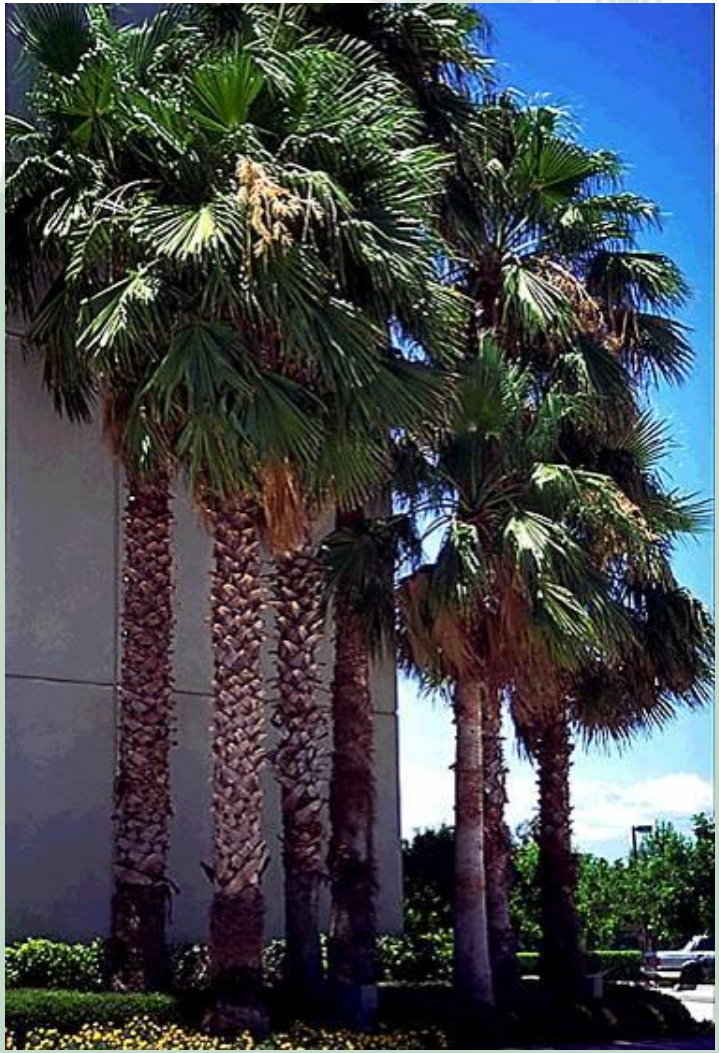
D*ypsis decaryi*

- Native to Madagascar
- Prefers full sun but can tolerate part shade or high light indoors
- Grows to 25’
- Extremely drought tolerant
- New spears covered with dark reddish-brown velvet; leaf bases form a distinct triangular shape
- No pest problems
- K deficiency

Washington Palm

Washingtonia robusta

- AKA Mexican Fan Palm
- Native to SW USA
- Full sun
- Grows rapidly to 70-100’
- Drought tolerant; moderately salt tolerant
- Problems: Thielaviopsis trunk rot, Fusarium wilt, K deficiency, lightening!
- Propagation: seeds – germinate in 2 weeks



Windmill Palm

Trachycarpus fortunei

- Native to Asia
- Prefers partial shade
- Cold tolerant
- Grows slowly to 20’
- Moderately salt and drought tolerant; prefers moisture
- Single, slender trunk covered in burlap-like fibers
- Fruits blue; on female plants only

Palm-like Plants: Cycads

- Not palms, but often referred to as palms
- Ancient plant group, mostly tropical and sub-tropical
- Many are endangered
- All parts are poisonous; particularly the seeds
- Family: Cycadaceae

Cycads

- Gymnosperms – Have cone-like fruiting structure
- Dioecious – Male and female plants

Female cone

Male cone

Cycads

- *Cycas revoluta* – King Sago
- *Cycas rumphii* – Queen Sago
- *Zamia*
  - Z. pumila – Coontie
  - Z. furfuracea – Cardboard Palm
- *Dione edule*
- *Ceratozamia*

Cycad Nutrition

- Similar to palms
- Palm special fertilizers are recommended
- Prone to Mg and Mn deficiencies

Mg deficiency symptoms
Note on *old* growth

Mn deficiency symptoms
Note on *new* growth

Pruning

- As with palms – do not prune green fronds
- Removing all fronds is stressful and can lead to additional issues:
  - Diseases
  - Nutritional deficiencies
  - Cold damage
  - Insects

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