Palm Care and Problems

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Nutritional Deficiencies

• Leaf symptoms remain forever!

• Correction of problem requires growth of nutritionally sufficient leaf tissue

• It may take 2 years to replace canopy

• Goal is prevention of deficiencies
Nutritional Deficiencies

Potassium (K)
Magnesium (Mg)
Maganese (Mn)
Boron (B)

All combinations!
Fertilizing Mixed Landscapes

Common Deficiencies

• Turf: N, Fe

• Broadleaf Trees and Shrubs: Mg, Fe, K, Mn, N

• Palms: K, Mn, B, Mg, Fe, N

Palm deficiencies include all of the turf and broadleaf trees and shrubs deficiencies
Fertilization of Field-grown and Landscape Palms in Florida

Dr. Timothy Broschat

http://edis.ifas.ufl.edu/EP261

Palm roots extend far beyond the canopy!!
Fertilizing Landscape Plants

• Use 8-2-12-4Mg with micronutrients
• Type of materials just as important as ratio
• N, K and Mg in controlled release form
• Micronutrients in soluble form
  • N – any controlled-release form acceptable
  • K – sulfur-coated potassium sulfate
  • Mg – prilled kieserite (special form of MgSO₄)
  • Mn – sulfate (e.g., TechMangam)
  • Fe – chelate (Trachelene Fe)
  • B – slow-release forms (e.g., Granubor)
Where to find 8-2-12-4Mg?

• Number of companies formulate this fertilizer in Florida, but most are only accessible to professional landscapers.

• John Deere Landscapes (LESCO)
  http://www.johndeerelandscapes.com
  click on “branch locator”
Release Patterns of Soluble and Controlled Release Fertilizers

Weeks

Plant needs
Soluble
Controlled release
Release Patterns of Soluble and Controlled Release Fertilizers
Components of an Effective Fertilization Program

(more than just the right fertilizer)

• Effective application methods
  • Broadcasting – best method!
  • Banding – no (only reaches some roots)
  • Fertigation – no (especially during rainy season)
  • Soil injection – no (placing below roots)
Fertilizing Landscape Plants

• Broadcast 15 lbs fertilizer (not N) per 1000 sq. ft. of bed or canopy area every 3 months with 8-2-12-4Mg with micros

• Fertilize turf within 50 ft. of any palm with recommended 8-2-12-4Mg with micros; it won’t hurt the turf

• If you can’t use the correct fertilizer, better to use no fertilizer at all near palms!
While deficient soils can be a cause of palm nutrient deficiencies, most are due to improper fertilization – especially turf fertilizers with high N content.
Potassium (K) Deficiency

- Translucent yellow-orange or necrotic spotting of foliage
- Marginal and/or leaflet tip necrosis (brown due to death)
- Most severe on oldest (lowest) leaves and towards tips of affected leaves
Translucent yellow-orange spotting
Easiest to see if hold leaf up to light
Marginal necrosis on fan palm leaf

Marginal necrosis on leaflet tips of feather palm
• Most severe on oldest leaves
• Most severe on leaf tip, decreasing towards leaf base
• Leaf petiole remains green; it is last leaf part to become necrotic
Other K deficiency symptoms:

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

Florida soils naturally deficient in K, but K deficiency often induced by improper fertilization
Magnesium (Mg) Deficiency

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

• Interveinal chlorosis with necrotic streaking
• Withering or frizzling of leaflet or leaf segment tips
• Death of meristem (bud)
• Affects newest leaves only
• More severe at leaf base than tip
• Interverinal chlorosis AND necrosis

• More common on feather-leaf palms
Mn deficiency:
• Youngest leaves are affected
• Leaflets closest to trunk are affected
• Opposite of K deficiency
Frizzletop = Mn deficiency
Meristem (bud) is killed

Queen palm with BOTH K and Mn deficiencies
Boron (B) Deficiency

- Stunted, necrotic-tipped leaves
- Multiple, incompletely opened spear leaves (should only be one unopened spear leaf at one time)
- Abortion of flowers and fruits
- Horizontal growth
- Death of meristem (bud)
- “Accordian” leaf symptoms
- Affects newest leaves
Multiple, unopened new leaves

Spear leaf doesn’t open completely
“Accordian” leaf symptoms

Symptoms remain until leaf naturally dies or until palm dies
Accordian leaf symptoms and necrotic leaf segment tips on new leaf

Necrotic leaf segment tips on new leaf
Horizontal growth

It will begin to grow upright again if boron deficiency is corrected - takes years
Palm Pruning
Palm Pruning:
-affects palm vigor
-affects palm nutritional health
-can transmit diseases
-can reduce vermin
-can affect cold hardiness
Self-cleaning Palms (crownshaft)

- *Roystonea* spp.
- *Adonididia merrillii* 
- *Wodyetia bifurcata*
- *Dypsis* spp.
Non Self-cleaning Palms
(no crownshaft)

- *Phoenix* spp.
- *Sabal* spp.
- *Washingtonia* spp.
- *Syagrus* spp.
- *Livistona* spp.
## Number of leaves retained

<table>
<thead>
<tr>
<th>Species</th>
<th>-K</th>
<th>+K</th>
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</thead>
<tbody>
<tr>
<td><em>Cocos nucifera</em></td>
<td>13</td>
<td>26</td>
</tr>
<tr>
<td><em>Phoenix canariensis</em></td>
<td>65</td>
<td>130</td>
</tr>
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</table>
Palm Abuse!!
What to trim?
-dead leaves & fruit stalks
-badly damaged leaves
-flower stalks?
-fruit stalks?
How much to remove?

If deficiencies exist, remove only dead leaves
How much to remove?

Never remove leaves at angle above the horizontal (9:00 – 3:00)
How much to remove?

Never remove leaves at angle above the horizontal (9:00/3:00)
How to remove leaves?
- cut leaf bases close, but not into trunk
- sterilize tools between trees
- do not attempt to tear leaves off if persistent—can leave permanent trunk wound and potential entry site for disease organisms
New Palm Diseases

• Lethal Yellowing (LY) — coconuts plus ~ 35 others
• Texas Phoenix Palm Decline — *Phoenix* spp., *Syagrus romanzoffiana*, *Sabal palmetto*
• Fusarium Wilt — primarily *Phoenix canariensis*
• Fusarium Decline — *Syagrus romanzoffiana*, *Washingtonia robusta*, *Syagrus x Butia*, others??
Palm Phytoplasma Diseases

Lethal Yellowing (LY)
Texas Phoenix Palm Decline (TPPD)

• phytoplasma = bacterium without a cell wall
• non-culturable; detect with molecular techniques
• phytoplasma found in phloem (vascular tissue)
• transmitted ONLY by phloem-feeding insects
• sensitive to tetracycline antibiotics
Lethal Yellowing

- Transmitted by planthopper that is common throughout Caribbean

- LY was limited to southern third of Florida because planthopper is not cold hardy – now observed in Manatee Co. and Polk Co., but very limited

- No hard freezes since late 1980s
Lethal Yallowing

• Symptoms vary based on palm species and cultivars within a species

• Coconut - premature nut fall; flower necrosis; oldest frond turns yellow

• BUT with Malayan Dwarf – often see necrosis (brown) and overall wilt
Typical yellowing of fronds
Spear leaf is last leaf to die
Malayan Dwarf and Maypan coconut cultivars

• Observe necrosis rather than yellowing of leaves
• May observe wilt symptoms
Phoenix spp.

Sequence of LY symptoms is different

1) Lowest leaves necrotic
2) Minimal, if any, leaf chlorosis
3) Spear leaf death occurs very early in disease
4) Remaining leaves die from bottom up
Texas Phoenix Palm Decline

- first brought to our attention in late 2006
- observed in both field nurseries and landscapes
- positive samples from southern Sarasota County to northern Hillsborough County; coastal Pinellas County to Polk County (Lakeland) to DeSoto County (Arcadia)
Texas Phoenix Palm Decline

• LY-group phytoplasma
• genetically distinct from LY phytoplasma
• observed only on west coast of FL
  - identical match with isolates from southern coastal Texas, where disease initially observed
• suspect planthopper vector is cold hardy
• host range unknown; documented in:
  - *Phoenix canariensis*, *P. dactylifera*, *P. sylvestris*
  - *Syagrus romanzoffiana*, *Sabal palmetto*
Texas Phoenix Palm Decline

Initial symptom is fruit drop and flower necrosis, but...

↑ Initial leaf symptoms – chlorosis followed quickly by necrosis
Texas Phoenix Palm Decline

← more necrotic older leaves than would be normal (as long as no one removes them!)

← next symptom is death of spear leaf

Same as LY, except also have root decay
LY and Texas Phoenix Palm Decline
Texas Phoenix Palm Decline

Symptoms are same as for *Phoenix* species

*Syagrus romanzoffiana*
No good diagnostic symptoms for sabal palms!

Which palm is dying from phytoplasma?
Management of LY and TPPD

Remove palm if >25% of leaves are discolored; or spear leaf is dead

- Leaving diseased (but still living) palm in nursery or landscape acts as source of phytoplasma for vector to spread to other susceptible palms

- Once bud is dead, palm will not continue to grow as no new leaves will be produced; look at spear leaf closely!!

- It is acceptable to use diseased tree as mulch since pathogen is spread only by insect vector
Management of LY and TPPD

➢ **Trunk injections with antibiotics**

- If <25% of leaves are discolored and bud is not dead, inject every four months with oxytetracycline HCl (OTC) – *not a guarantee!*

- Best to use as a **preventive** treatment - i.e., inject palms that are not symptomatic

- Only one source of oxytetracycline HCl

- **TreeSaver®** at www.palmtreesavers.com
Management of LY and TPPD

- Preventive use of OTC injections
  - is LY or TPPD in the general neighborhood?
  - value and location of palm?
  - is or can palm be monitored closely? i.e., wait for first symptoms before begin injections
  - only inject susceptible palms

- No PCO license required for OTC injections
  - see Florida Statute 482.211 (10)
Texas Phoenix Palm Decline

- Documented hosts
  - *Phoenix canariensis*
  - *Phoenix dactylifera*
  - *Phoenix sylvestris*
  - *Syagrus romanzoffiana*
  - *Sabal palmetto*
  - others???
Fusarium Wilt of P. canariensis

Caused by *Fusarium oxysporum* f. sp. *canariensis*
• leaflets die on one side of petiole
• dark-brown streak on petiole
• eventually entire leaf dies
• NO CURE!!
Fusarium Wilt of *P. canariensis*

Primarily spread by infested pruning tools
Fusarium Decline

- **new** disease in Florida, world
- **new** *Fusarium oxysporum* subsp.
- initially referred to as: “New Queen Palm Disease”
- more hosts: *Washingtonia robusta*  
  *Syagrus x Butia* (mule)
Disease moves from bottom of canopy upwards
• Canopy does not collapse around trunk
• Leaves die in place – toxin production?
Fusarium Decline

TPPD

dead spear leaf
• Usually, but not always, observe one-sided death of leaflets plus stripe on petiole/rachis

• Internal discoloration
Based on field symptoms, can’t tell the difference between Fusarium decline and petiole blight diseases.
Fusarium Decline

• Dying palms should be removed
  – fungus is spread by wind, and possibly by infested tools

• No cure!
Focus on the problems you can control or manage!

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