

# **Palm Nutrition and Management**

**Dr. Monica L. Elliott**

**University of Florida - IFAS**

**Fort Lauderdale Research & Education Center**

**melliott@ufl.edu**

# **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!**

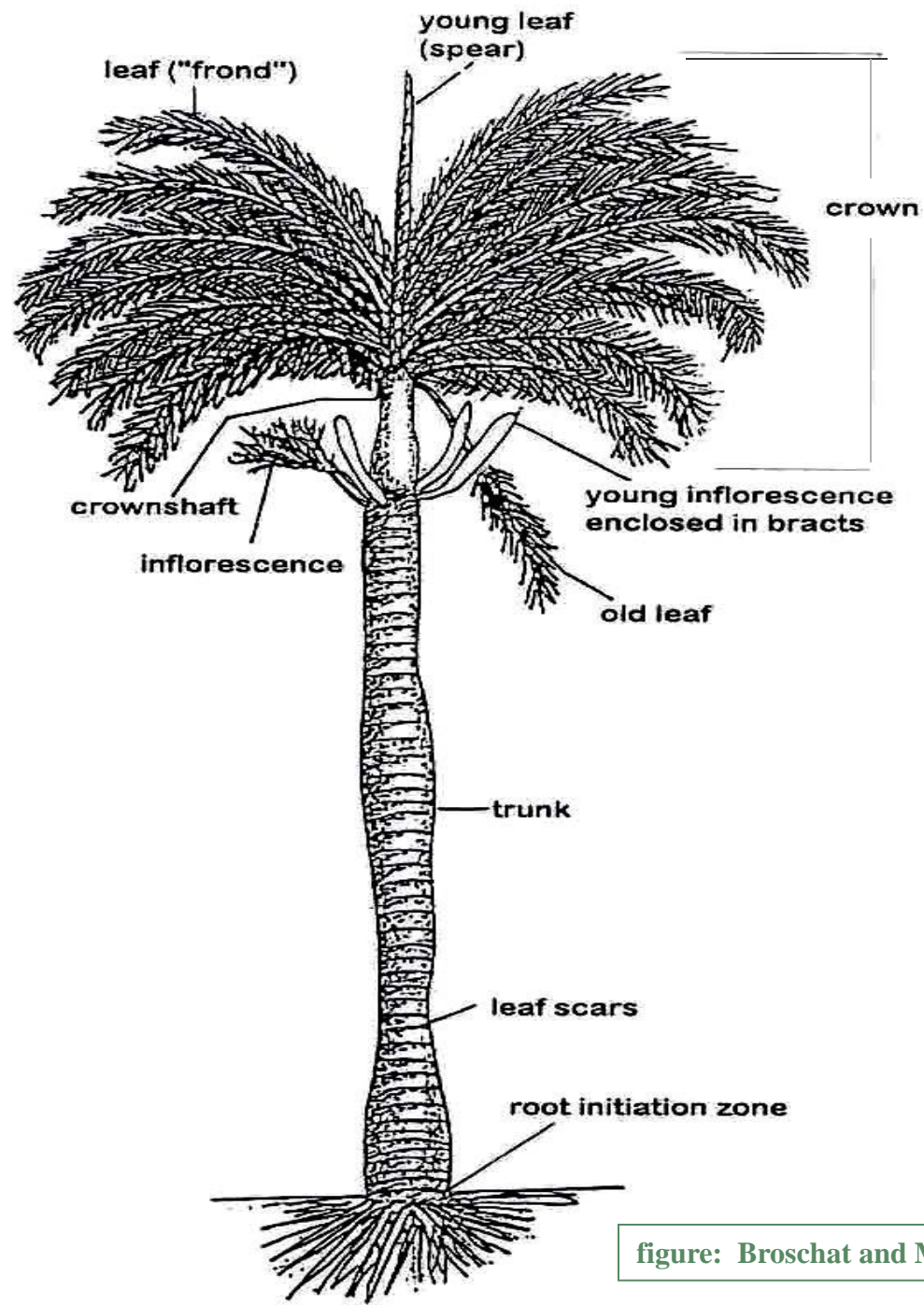
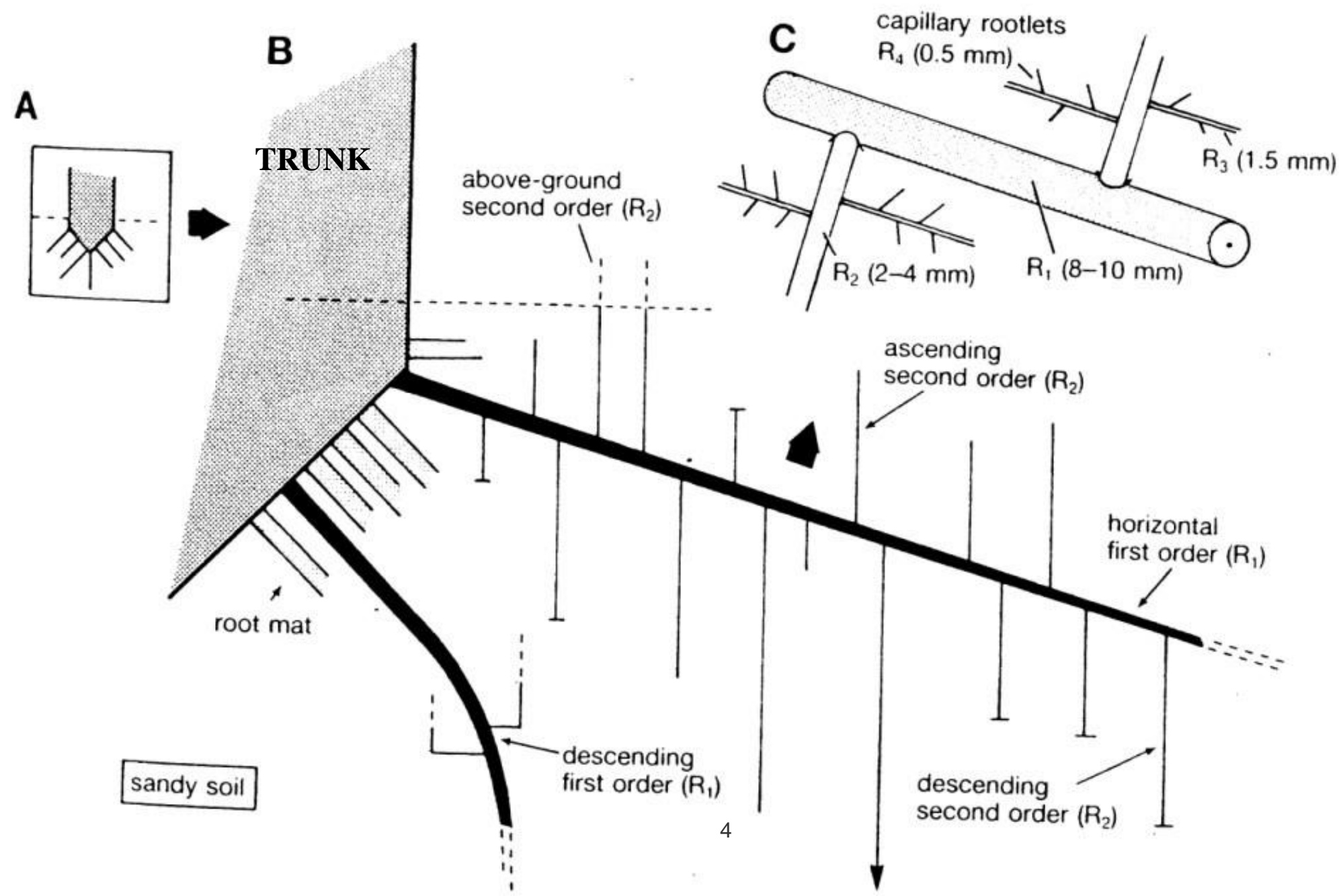


figure: Broschat and Meerow, 2000



# **Top Four Palm Nutritional Deficiencies**

---

**Potassium (K)**

**Magnesium (Mg)**

**Manganese (Mn)**

**Boron (B)**

**All combinations!**

# Nutritional Deficiencies

- Leaf symptoms remain forever, especially necrotic (dead) tissue
- Correction of problem requires growth of nutritionally sufficient leaf tissue
- It may take 2-4 years to replace canopy
- Goal is prevention of deficiencies

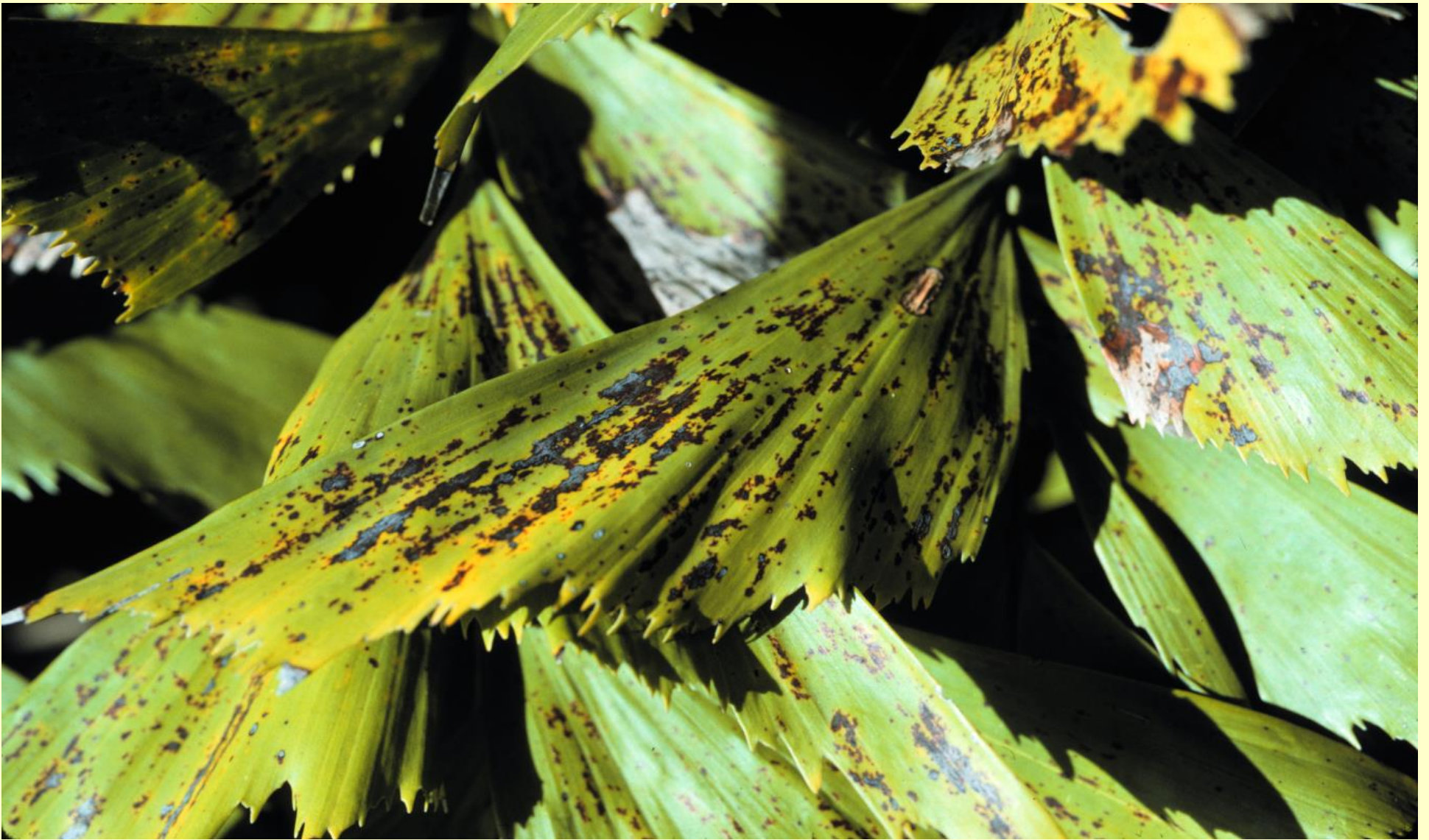
# Potassium (K) Deficiency

- 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**





**Necrotic spotting of leaflets**



**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; 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



# **Number of leaves retained**

---

<b>Species</b>	<b>-K</b>	<b>+K</b>
<i>Cocos nucifera</i>	<b>13</b>	<b>26</b>
<i>Phoenix canariensis</i>	<b>65</b>	<b>130</b>



# 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 & K**







**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**



- **Interveinal 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**





**Frizzle top = 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)
- “Accordion” leaf symptoms
- Affects **newest** leaves



**Multiple, unopened new leaves**



**“Accordion” leaf symptoms**





## **Horizontal growth**

**It will begin to grow upright again if boron deficiency is corrected - takes years**



**Induced K deficiency**



**Induced Mg deficiency**

**While deficient soils can be a cause of palm nutrient deficiencies, most are due to improper fertilization – especially turf fertilizers with high N content**

# 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**

# Fertilizing Mixed Landscapes

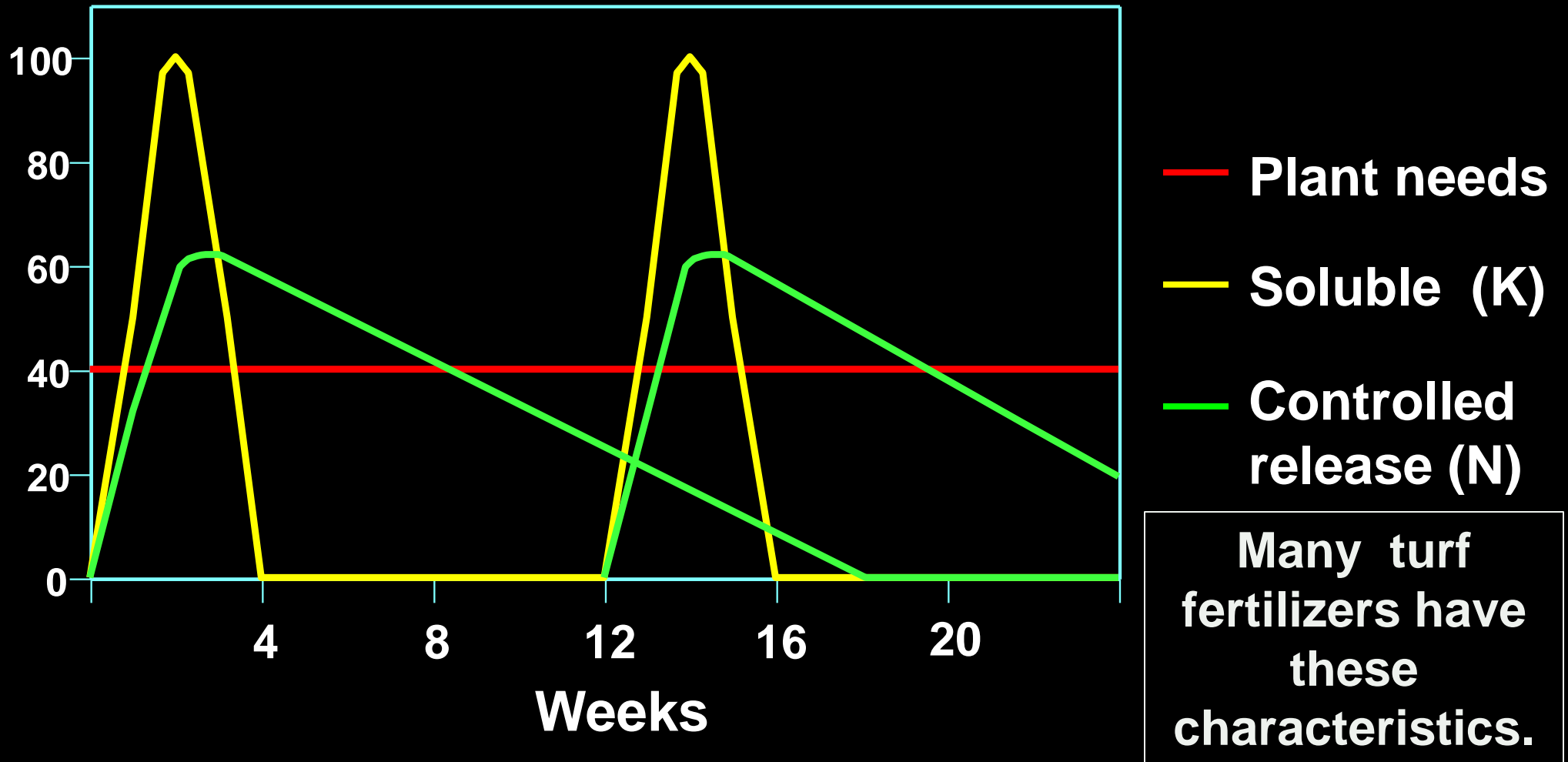
## Why integrated approach?

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

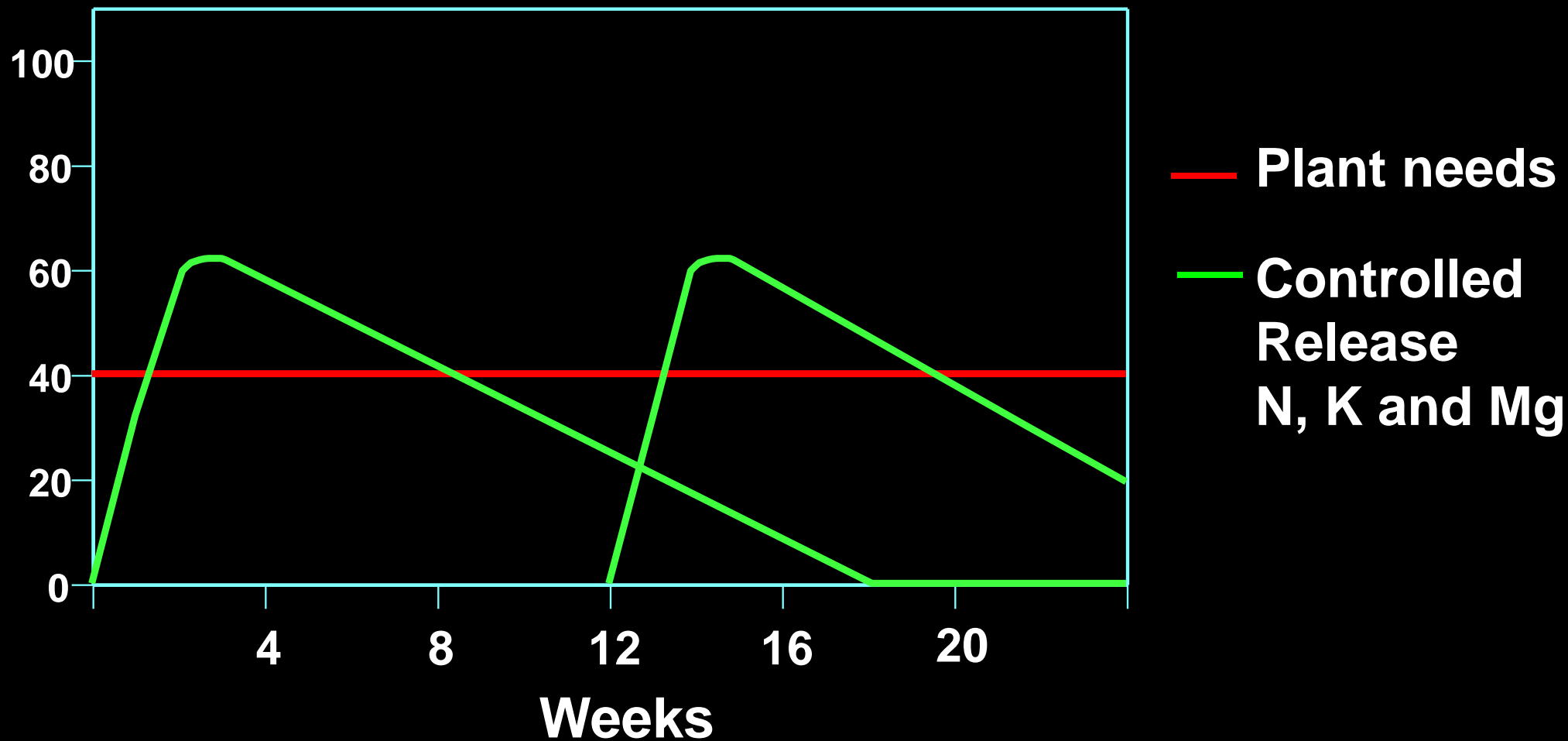
# Fertilizing Landscape Plants

- Use 8-2-12-4Mg with micronutrients
- Type of materials just as important as ratio
- N, K and Mg in 100% controlled release form
- **Micronutrients:** form depends on nutrient
  - N – any controlled-release form acceptable
  - K – sulfur-coated potassium sulfate
  - Mg – prilled kieserite (special form of  $\text{MgSO}_4$ )
  - Mn – sulfate (e.g., TechMangam)
  - Fe – chelate (Trachelene Fe)
  - B – slow-release forms (e.g., Granubor)

# Release Patterns of Soluble and Controlled Release Fertilizers



# Release Pattern of N, K and Mg in 8-2-12-4Mg Palm Fertilizer



# **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”**



# 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, but use less (12.5 lbs)
- If you can't use the correct fertilizer, better to use no fertilizer at all near palms!



# Fertilizing Landscape Plants

If you are located in an area that prohibits:

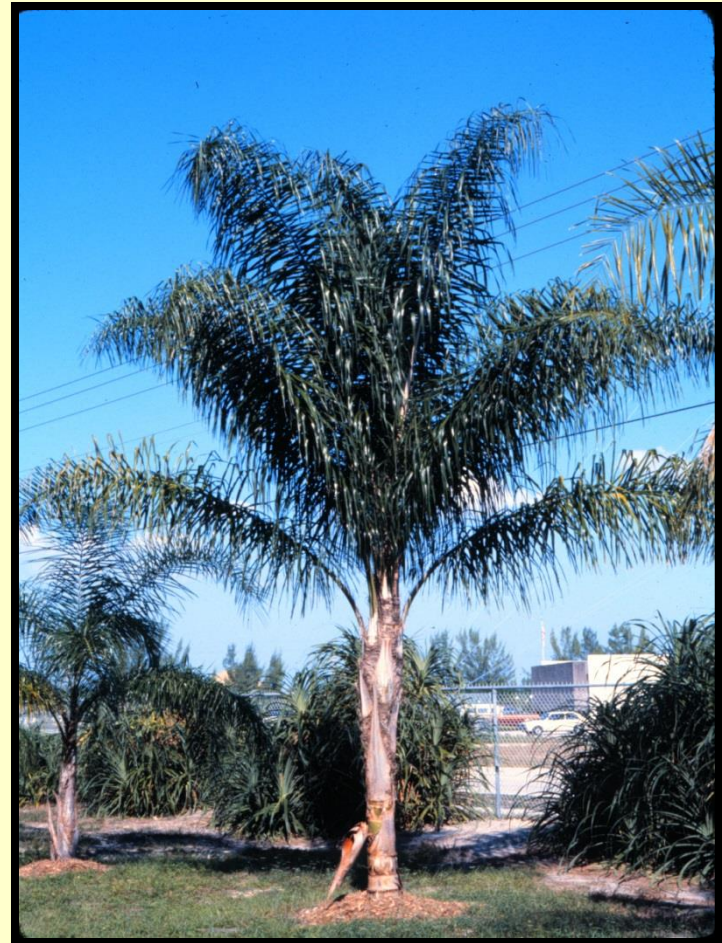
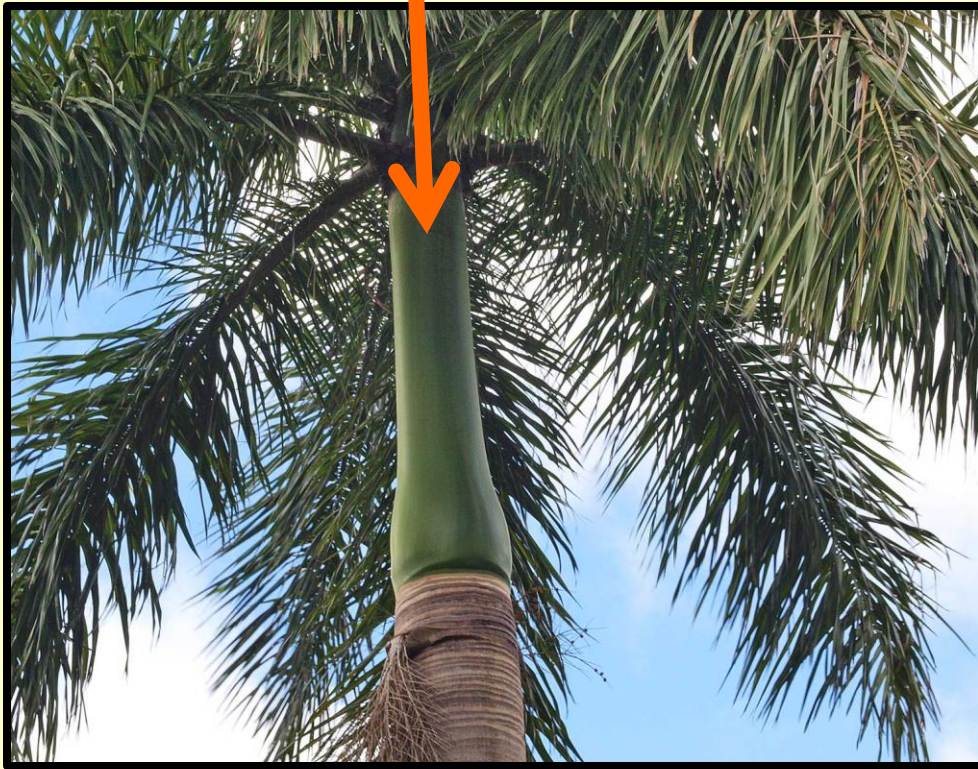
- P all year, use **8-0-12-4Mg** (same rate)
- N and P during the summer months, apply **8-2-12-4Mg** in Feb., May and Nov., but **0-0-16-6Mg** in Aug. (same rate)

# **Palm Pruning**

- affects palm vigor**
- affects palm nutritional health**
- can transmit diseases**
- can reduce vermin**
- can affect cold hardiness**

# Self-cleaning vs. Non self-cleaning

**Self-cleaning crown shaft**      **Non self-cleaning no crown shaft**





**Natural senescence**  
← occurs within a few days

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



# How much to remove?

**If deficiencies exist, remove only dead leaves**

**Never remove leaves at angle above the horizontal  
(9:00–3:00 position on clock)**

# Palm Abuse: Pruning Palm to Death!!

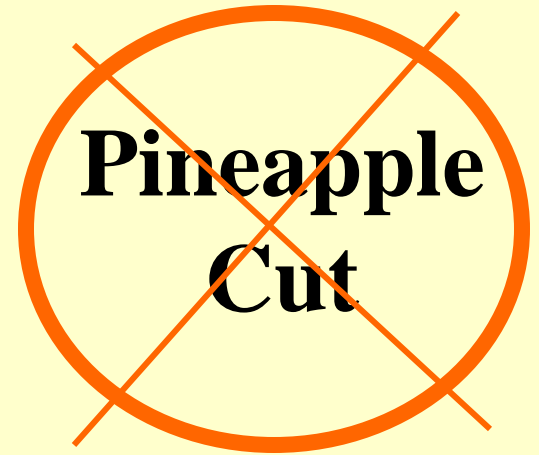






**K is a mobile element**

# Palm Abuse!!



- Fusarium Wilt
- Palm Weevils
- K & Mg Def.



~~Hurricane  
Cut~~



# What to trim?

- dead leaves & fruit stalks
- flower stalks?
- fruit stalks?



# **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!**