CANARY ISLAND DATE PALMS ON THE EMBARCADERO

Phoenix canariensis

SUMMARY OF FINDINGS

CONDITION	# OF PALMS
Good condition, no disease or insects	60
OK condition, no disease or insects	39
Slight Mg deficiency; but no disease or insects	28
Moderate Mg deficiency; but no disease or insects	50
Severe MG deficiency; but no disease or insects	10
Slight Mn deficiency; but no disease or insects	8
K deficiency	3
Slight Cu deficiency; but no disease or insects	3
Infected with Fusarium wilt – confirmed	17
Suspicious – may be infected with Fusarium wilt	8

** Some palms may have multiple deficiencies*

OTHER CONCERNS

Longevity and structural stability of palms:

- Epiphytes
- Hourglass
- Seeding
- Cavities
- Pink rot (*Nalanthamala vermoeseni*)
  - *(previously Penicillium vermoeseni* or *Gliocladium vermoeseni*)
- Sudden crown drop

FUSARIUM WILT

(*Fusarium oxysporum* f.sp. *canariensis*)

- A particularly aggressive strain of the fungus that attacks Canary Island date palms
- Disease causes loss of function of the water conducting cells within the plant
- Unknown whether it causes cell dysfunction through physical plugging, enzymatic action and/or fungal toxin action. But likely to be one or more of the above

HISTORY OF DISEASE

1973

Initially described by
Italians and French

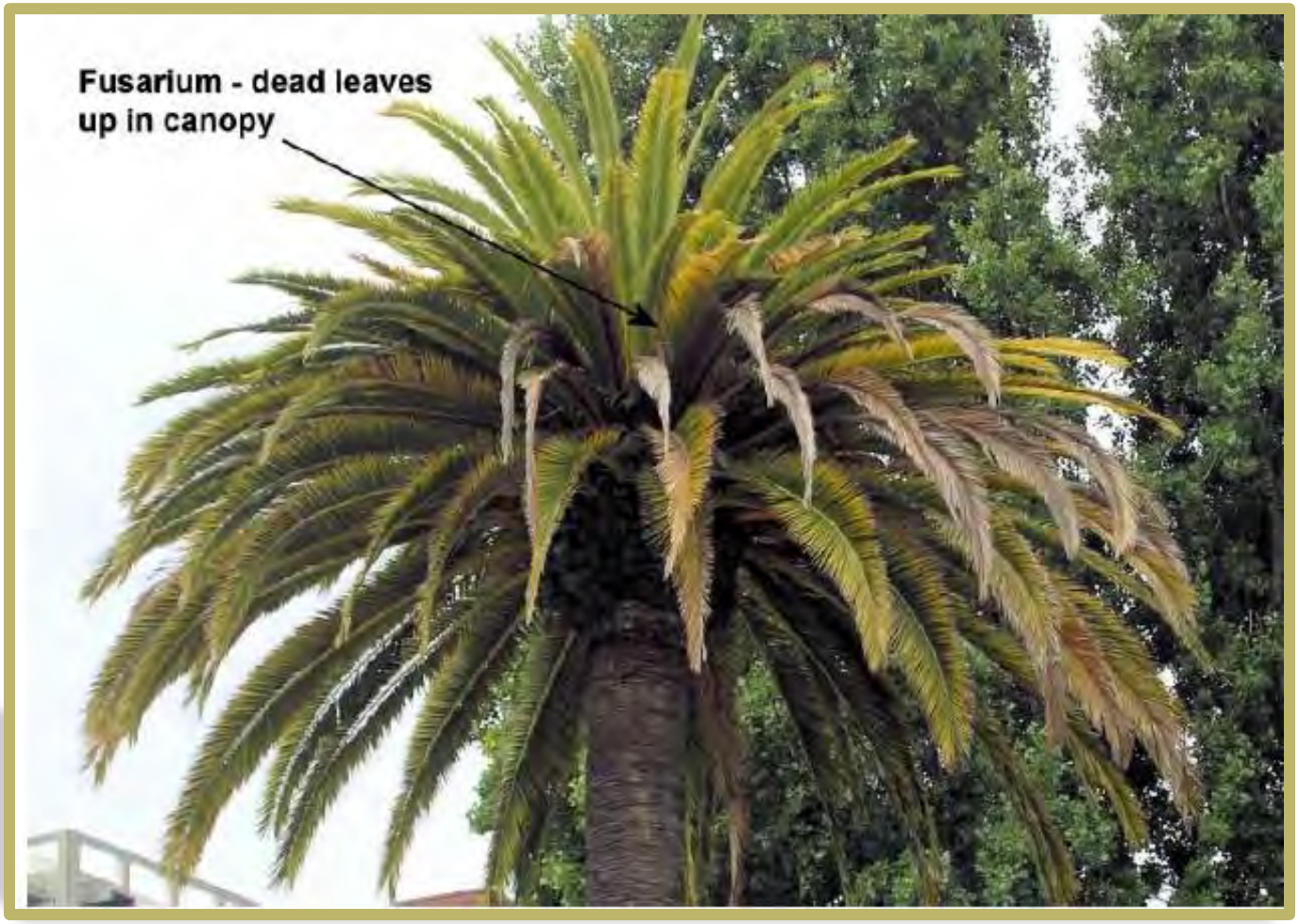
FIRST SIGHTINGS IN CALIFORNIA

30-50 year old
Canary Island date palms
in San Diego

CURRENT DISTRIBUTION OF THE DISEASE IN CALIFORNIA

Los Angeles, Orange, Riverside,
Sacramento, San Francisco,
San Bernardino, San Diego,
San Mateo & Santa Barbara counties

SYMPTOMS OF AFFECTED PALMS



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- Exhibit reduced vigor during early disease onset
- Sometimes, first symptomatic leaf is in the mid-canopy

SYMPTOMS OF AFFECTED PALMS

One-sided distribution of the disease. This is not diagnostic, but is very indicative.

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- **Fronds die in a one-sided manner**
- **Decline on the tree may also seem one-sided**


Note one-sided
death of canopy
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SYMPTOMS OF AFFECTED PALMS

Petioles and rachises with Fusarium wilt typically show pink/reddish brown internal vascular discoloration

SYMPTOMS OF AFFECTED PALMS

- Extremely water stressed palms can also have similar symptoms to Fusarium wilt

- Symptoms are most pronounced during higher temperatures and greater water demand
    - "Rapid Decline" stage of diseased induced

FUSARIUM WILT IS FATAL –

there are no known cures
so prevention is essential!

PREVENTION + MANAGEMENT

- Pathogen does not have a widely disseminated airborne spore stage
- Limit pruning where disease is known to exist to once a year or less
- Only remove dead fronds

PREVENTION + MANAGEMENT

USE ONLY STERILE HAND SAWS

- Disease is primarily spread by pruning with un-sterile saws
- Fungus can persist in the saw dust, in the casing of the saw. Even removal and soaking of the chain cannot ensure disinfection
- Fungus can also persist between pruning teeth of the saws. Remove saw blade and soak in 1:1 ratio of bleach in water or undiluted rubbing alcohol for a minimum of 10 minutes
- We recommend a NEW saw blade for each palm

REPLACEMENT OF PALM TREES

- Digging and craning out the entire palm is the only recommended method of removal
- Chainsaws and chipper should **not** be used
- Disposal must be in compliance with CA state agricultural guidelines
- Prior to planting, have palms evaluated by palm specialists

REPLACEMENT OF PALM TREES

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✗ ***Phoenix canariensis***

✓ ***Phoenix dactylifera***

(True date) appears to be highly resistant to the disease, and is the species we are using to replace trees on the Embarcadero.

OTHER IMPACTED SPECIES

reported to have been infected in unpublished studies

- ***Washingtonia filifera*** **(mature)**
- ***Phoenix*** **sps**
  - ***P. dactylifera ****
  - ***P. reclinata***
  - ***P. sylverstris***
- ***Chamaerops humulis***

***Dr. Donselman has not seen any strong evidence and said he was unaware of any True Date palms diagnosed with the disease.**

TREATMENTS SINCE 2011

INFECTED

- OR -

"SUSPICIOUS"

PALM TREES

PHOSPHITE TREATMENT

not a cure, but shows promise in slowing the disease

TREATMENTS SINCE 2011

NUTRIENT DEFICIENT PALM TREES

MACRO+MICRO TREATMENT

NUTRIENT DEFICIENCY	SYMPTOMS / IMPACTS
Mg Magnesium	Yellowing of older fronds, bright yellow
Mn Manganese	“flat top”, stunted and frizzled new leaves
K Potassium	Dull orange/tan leaves, frizzled and small new leaves; tree can decline and die

ACTIONS SINCE 2011

- **Trees replaced to date : 4**
  with Phoenix dactylifera
- **Trees to be replaced : 4**
  with Phoenix dactylifera
- **New experimental treatment testing**
- **Preparing Capital Plan (with SF Port) to replace trees over time**
  with Phoenix dactylifera


SPEED
LIMIT
35