



# CITRUS SPRINGS

**PALM TREE DISEASES  
INVADING CITRUS VILLAS**



# **GOALS**

RECOGNIZE THE DISEASE

REACT TO THE DISEASE

SLOW THE SPREAD OF THE DISEASE

LEARN YOUR OPTIONS

# ***TWO DISEASES***

GANODERMA BUTT ROT



FUSARIUM WILT





# ***GANODERMA BUTT ROT***

CAUSED BY THE FUNGUS  
*GANODERMA ZONATUM*

THE FUNGUS PRODUCES SPORES  
THAT SPREAD THE DISEASE

# ***SYMPTOMS***

MILD TO SEVERE WILTING OF FRONDS





# ***SYMPTOMS***

WILTING OF FRONDS IS NOT  
A CERTAIN INDICATION  
THAT GANADERMA BUTT ROT  
HAS INFECTED THE TREE



# ***GANODERMA BUTT ROT***

WILTING FRONDS COULD  
INDICATE A DISEASED TREE

**OR**

THAT THE TREE IS SICK OR DYING  
FROM SOME OTHER CAUSE



# ***CERTAIN DIAGNOSIS - CONK***

FORMATION OF THE  
BASIDIOCARP COMMONLY  
CALLED A CONK

# ***CERTAIN DIAGNOSIS - CONK***

THE LOWER 4-5 FEET OF THE TRUNK



# ***CERTAIN DIAGNOSIS - CONK***

ALL DISEASED PALMS DO NOT  
PRODUCE CONKS PRIOR TO DEATH



# ***CERTAIN DIAGNOSIS - TRUNK***

SPORES ATTACK  
FROM THE GROUND  
UP

DEGRADES THE  
LOWER 4-5 FEET OF  
THE TRUNK

TREE MUST BE CUT  
DOWN TO SEE THIS  
SYMPTOM





# ***GANADERMA BUTT ROT PROPAGATION***

A MATURE CONK WILL RELEASE  
SPORES INTO THE SOIL

SPORES ARE TRANSPORTED:

- BY THE WIND
- ON WILDLIFE
- ON LANDSCAPING EQUIPMENT



# ***GANADERMA BUTT ROT IMMUNITY***

THERE ARE NO SPECIES OF PALM TREE  
IMMUNE TO THIS DISEASE

SOME SPECIES ARE LESS  
LIKELY TO BE INFECTED.



# ***GANADERMA BUTT ROT SUSCEPTIBILITY***

QUEEN PALMS AND FOX TAIL  
PALMS ARE AMONG THE MOST  
LIKELY TO DIE FROM GANODERMA  
BUTT ROT OF PALMS

# ***GANADERMA BUTT ROT PREVENTION***

**N O N E**

**THERE IS NO SURE WAY TO  
PREVENT THE DISEASE**

# ***GANADERMA BUTT ROT CURE***

**N O N E**

**ONCE THE TREE IS  
INFECTED IT IS DEAD**



# ***SLOW THE SPREAD***

## ***1<sup>st</sup> - DONK THE CONK***

WEAR DISPOSABLE GLOVES

REMOVE THE CONK BEFORE  
IT RELEASES SPORES

SEAL IT IN A PLASTIC BAG  
PLACE IT IN THE GARBAGE

NOT IN RECYCLE OR AS MULCH



***SLOW THE SPREAD***  
***2<sup>nd</sup> - REMOVE THE TREE***

THE TREE IS DEAD.  
IT CAN NOT BE SAVED.  
THE INFECTED TREE MUST  
BE REMOVED AS QUICKLY  
AS POSSIBLE.



***SLOW THE SPREAD***  
***2<sup>nd</sup> - REMOVE THE TREE***

A DISEASED TREE WILL  
CONTINUE TO PRODUCE  
SPORES AS LONG AS IT IS  
STANDING.



***SLOW THE SPREAD***  
***3<sup>rd</sup> - TREAT THE SOIL***

THE SOIL CONTAINS  
SPORES THAT WILL BE  
SPREAD TO OTHER TREES

REPLACE OR FUMIGATE THE SOIL



# ***GANADERMA BUTT ROT REPLANTING PALM TREES***

THE FUNGUS EXISTS IN THE SOIL

THE FUNGUS CAN NOT BE KILLED

PLANTING ANOTHER PALM TREE  
OF ANY SPECIES IN THE SAME  
LOCATION IS

**NOT RECOMMENDED**

# ***FUSARIUM WILT OF PALMS***

QUEEN PALMS



MEXICAN FANS  
(WASHINGTONIAN)



# ***FUSARIUM WILT OF PALMS***

THE DISEASE IS CAUSED BY THE FUNGUS  
*FUSARIUM OXYSporUM* F. SP. *PALMARUM*.

THE FUNGUS PRODUCES SHORT-LIVED SPORES  
(MACROCONIDIA AND MICROCONIDIA).

**IT ALSO PRODUCES SPORES CALLED  
CHLAMYDOSPORES THAT LIVE IN THE SOIL AND  
PLANT TISSUE FOR LONG TIME PERIODS.**

***USUALLY YEARS***

# DIAGNOSIS

## QUEEN PALMS

One leaf with some or all leaflets discolored on one side of the rachis.

The leaflets on the opposite side of the rachis will be a healthy green color.



# DIAGNOSIS

## MEXICAN FANS (WASHINGTONIAN)

AT LEAST ONE OLDER  
LEAF WITH A MIXTURE OF  
HEALTHY AND NECROTIC  
LEAFLET SEGMENTS IN THE  
LEAF BLADE.

WILL EVENTUALLY SPREAD  
TO THE ENTIRE LEAF THEN  
THE ENTIRE TREE.





# *DIAGNOSIS*

NO OTHER FUNGAL DISEASE KILLS  
THE ENTIRE PALM CANOPY SO QUICKLY.

IF THE DISEASE IS PROGRESSING  
VERY QUICKLY, THERE MAY ONLY  
BE ONE LEAF WITH TYPICAL SYMPTOMS  
BECAUSE THE LEAVES ARE DYING SO RAPIDLY.



# *PROPAGATION*

WIND-BLOWN SPORES ARE STRONGLY SUSPECTED AS A PRIMARY METHOD.

ONCE THE DISEASE IS ESTABLISHED IN A LANDSCAPE, IT IS THOUGHT THAT THE DISEASE MAY BE TRANSMITTED FROM PALM TO PALM VIA LEAF-PRUNING EQUIPMENT.



# *PRUNING*

NEVER REMOVE GREEN FRONDS  
FROM A PALM.

PALMS STORE EXCESS NUTRIENTS  
IN THE LOWER FRONDS.

REMOVING THESE FRONDS ESSENTIALLY STARVES  
THE PALM AND LEADS TO NUTRIENT DEFICIENCIES.



# *PRUNING*

ROUTINE PRUNING SHOULD BE RESTRICTED TO  
REMOVAL OF DEAD OR DYING LEAVES ONLY.

SEVERE PRUNING WEAKENS PALMS  
AND MAY INCREASE THE RISK OF  
PATHOGEN TRANSMISSION.

PRUNING SHOULD BE VIEWED AS A  
RISK FACTOR FOR FUSARIUM WILT  
DISEASE TRANSMISSION & NOT  
AS A BENEFIT TO THE PALM.

# *SUSCEPTIBILITY*

IT IS **NOT** RECOMMENDED THAT  
A QUEEN PALM OR MEXICAN FAN  
PALM BE PLANTED IN A SITE  
WHERE ONE OF THESE SPECIES  
HAS DIED FROM FUSARIUM WILT.



# *FUSARIUM WILT PREVENTION*

**NONE**

THERE IS NO SURE WAY TO  
PREVENT THE DISEASE



# *FUSARIUM WILT CURE*

**N O N E**

**ONCE THE TREE IS INFECTED  
IT IS DEAD**



***SLOW THE SPREAD***  
***1<sup>ST</sup> - REMOVE THE TREE***

THE TREE IS DEAD.  
IT CAN NOT BE SAVED.

THE INFECTED TREE MUST  
BE REMOVED AS QUICKLY  
AS POSSIBLE



***SLOW THE SPREAD***  
***1<sup>ST</sup> - REMOVE THE TREE***

THE FUNGUS CONTINUES TO PRODUCE  
LONG LASTING SPORES EVEN THOUGH  
THE TREE IS DEAD OR DYING.

THE LONGER THE TREE REMAINS  
IN PLACE THE MORE SPORES  
IT PRODUCES.



***SLOW THE SPREAD***  
***2<sup>ND</sup> - REPLACE THE SOIL***

THE FUNGUS AND THE SPORES  
ARE IN THE SOIL.

THEY CAN BE TRANSPORTED TO  
OTHER TREES IN YOUR YARD OR  
YOUR NEIGHBORS'.



***SLOW THE SPREAD***  
***3<sup>RD</sup> - CLEAN YOUR TOOLS***

EQUIPMENT USED TO REMOVE  
LEAVES FROM AN INFECTED  
QUEEN PALM OR MEXICAN FAN PALM  
WILL HAVE FUNGUS-INFESTED  
LEAF MATERIAL REMAINING  
ON THE BLADES.



***SLOW THE SPREAD***  
***3<sup>RD</sup> - CLEAN YOUR TOOLS***

IF EQUIPMENT IS NOT CLEANED  
AND DISINFECTED, THE NEXT  
QUEEN PALM OR MEXICAN FAN PALM  
PRUNED BY THIS EQUIPMENT WILL  
BE EXPOSED TO FUNGUS-INFESTED  
LEAF MATERIAL.

# ***SLOW THE SPREAD***

## ***3<sup>RD</sup> - CLEAN YOUR TOOLS***

<b>Material</b>	<b>Percent Solution</b>	<b>Soaking Time</b>
Housebleach (e.g., Chlorox®)	25% (1 part bleach + 3 parts water)	5-10 minutes
Pine oil cleaner (e.g., Pine Sol®)	25% (1 part cleaner + 3 parts water)	5-10 minutes
Rubbing Alcohol	50% (1 part alcohol + 1 parts water)	5-10 minutes
Denatured Ethanol	50% (1 part ethanol + 1 parts water)	5-10 minutes

**Note: The above materials were shown to be effective in eliminating *F. Oxysporum* from the wood dust or palm sap trapped on pruning tools (Simone 1998) It is suggested the solution be replaced after 10 trees or every 2 hours. Rinse the tool with fresh water after disinfecting. Other potential disinfectants are trisodium phosphate or quaternary ammonium salts. The latter is recommended at a 5% solution, soaking for 5 minutes. ( Smith, Smith, and Clements 2003)**



# *REPLANTING*

HARDWOOD TREES  
ARE IMMUNE TO  
*GANODERMA BUTT ROT*  
AND  
*FUSARIUM WILT*

# DECLARATION OF COVENANTS, CONDITIONS AND RESTRICTIONS

## ARTICLE 10.1

IT IS THE DEVELOPER'S INTENT TO PROTECT THE COMMUNITY FROM NUISANCES AND MAINTAIN THE AESTHETIC QUALITY, WITH **SUBSTANTIAL UNIFORMITY**, OF THE HOMES. THE SUBDIVISION ASSOCIATION MAY ADOPT ADDITIONAL STANDARDS AND CRITERIA TO EFFECT THE PURPOSES OF THIS SECTION AND ARTICLE.



# ***HARDWOOD RESEARCH CRITERIA***

- SIZE
- SPREAD
- ROOT SYSTEM
- EVERGREEN
- LIGHT
- ZONE 9B OR 10A
- SAP
- FRUIT & SEED
- WILDLIFE
- NON INVASIVE
- NON POISONOUS
- NON STAINING
- MAINTENANCE
- ***FLORIDA “FEEL”***

# *HARDWOOD RESEARCH*

## *SPECIES*

- CRAPE MYRTLE
- DAHOON HOLLY
- JAPANESE BLUEBERRY
- SIMPSON STOPPER
- FIDDLEWOOD
- FOSTERS #2 HOLLY
- LIVE OAK
- SWEET VIBURNUM
- WHITE GEIGER
- MARLBERRY
- CAMELIA
- MARY NELL HOLLY
- MYRTLELEAF HOLLY
- EASTERN REDBUD
- WILD OLIVE
- ROUND HOLLY
- RED BAY
- MYRTLE OAK
- RUSTY BACKHAW
- YAUPON HOLLY
- WALTER'S VIBURNUM
- AMERICAN HORNBEAM



***LITTLE GEM***  
***SOUTHERN MAGNOLIA***

20-30 FEET TALL

10-15 FEET SPREAD

NO ROOT DAMAGE

NO FLESHY FRUIT

EVERGREEN

RELATIVELY CLEAN TREE

PRUNED AS A BUSH OR CLEAR TRUNK

# ***AUTHORIZED HARDWOOD***

## **“LITTLE GEM” SOUTHERN MAGNOLIA**





# *TREE QUALITY*

ALL TREES PLANTED IN THE VILLAS OF  
CITRUS SPRINGS, REGARDLESS OF  
THE REASON, MUST BE GRADED AT

**FLORIDA FANCY OR FLORIDA #1**

# ***FLORIDA GRADING***

## **FLORIDA GRADES & STANDARDS FOR NURSERY PLANTS 2015**

**FDACS-P-02036**

<http://www.johnsonengineering.com/wp-content/uploads/2015/09/2015-Florida-Grades-and-Standards.pdf>

# ***INVASIVE PLANT SPECIES***

## FLORIDA EXOTIC PLANT PEST COUNCIL 2015 LIST OF INVASIVE SPECIES

<http://www.fleppc.org/list/2015FLEPPCLIST-LARGEFORMAT-FINAL.pdf>

# ***GANODERMA BUTT ROT SOURCES***

UNIVERSITY OF FLORIDA  
IFAS EXTENSION SERVICE

<http://manatee.ifas.ufl.edu/comm-hort/pdf/palms/GanodermaButtRotPP10000.pdf>

Fact Sheet 100

<http://edis.ifas.ufl.edu/pp100>

Publication #PP54

# ***FUSARIUM WILT SOURCES***

UNIVERSITY OF FLORIDA  
IFAS EXTENSION SERVICE

<http://edis.ifas.ufl.edu/pp278>

Publication #PP278

[http://lee.ifas.ufl.edu/Hort/GardenPubsAZ/Fusarium\\_Wilt.pdf](http://lee.ifas.ufl.edu/Hort/GardenPubsAZ/Fusarium_Wilt.pdf)