

## Graphiola Leaf Spot (False Smut) of Palm<sup>1</sup>

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### Summary

- Graphiola leaf spot is a fungal leaf disease caused by *Graphiola phoenicis*. The disease is often referred to as “false smut.”
- The primary hosts in Florida are *Phoenix* species, especially *Phoenix canariensis* (Canary Island date palm) and *Phoenix dactylifera* (date palm).
- The disease is easily diagnosed by direct examination of the affected leaf tissue. Very small (1/16 inch), black, cup-shaped fungal bodies (sori) are present on the leaf blade of the oldest leaves (lowest leaves in the canopy). They can be easily observed without any magnification.
- The disease is primarily cosmetic, and does not adversely affect plant growth in the landscape. Confusion regarding the seriousness of the problem occurs because most *Phoenix* palms grown in Florida suffer from nutrient deficiencies, which are far more debilitating than this disease.
- Remove diseased leaves **only** if the palm is not exhibiting nutrient deficiency symptoms. Removal of nutrient deficient leaves will only make the nutrient deficiency worse, which will adversely affect palm health.
- Fungicides may be useful for managing this disease, but research is limited as to products to use and timing of applications.

### Introduction

Graphiola leaf spot, also referred to as “false smut,” is a foliar pathogen of certain palm species. In Florida, it is primarily a cosmetic disease and does not adversely affect plant growth. Nutrient deficiencies, such as potassium or magnesium deficiency, are much more serious palm health problems than this disease, especially for *Phoenix* species.

### Pathogen and Hosts

This disease is caused by the fungal pathogen *Graphiola phoenicis*. It is a unique fungus, both in appearance and life cycle, but it is widely distributed throughout the date palm-growing world. While numerous palm species have been identified as hosts of this fungus, the disease is most prevalent in Florida on *Phoenix* species, such as *Phoenix canariensis* (Canary Island date palm) and *Phoenix dactylifera* (date palm). It is rarely observed on *Phoenix sylvestris* (wild date palm).

Other palms on which *G. phoenicis* has been observed include: *Acoelorrhaphe wrightii*, *Arenga pinnata*, *Butia capitata*, *Chamaerops humilis*, *Coccothrinax argentata*, *Cocos nucifera*, *Dypsis lutescens*, *Livistona alfredii*, *Livistona chinensis*, *Phoenix roebelenii*, *Phoenix sylvestris*, *Phoenix theophrasti*, *Prestoea acuminata*, *Roystonea regia*, *Sabal minor*, *Sabal palmetto*, *Syagrus romanzoffiana*, *Thrinax morrisii*, and *Washingtonia robusta*.

## Symptoms and Signs

The symptom of a disease is the plant's expression of infection from a plant pathogen, such as spots, lesions, cankers or root rots. The sign of a disease is the observation of the causal pathogen on the affected plant tissue. With *Graphiola* leaf spot, the signs of the disease are more prevalent and more easily observed than the symptoms of the disease. Both signs and symptoms will be observed on the oldest leaves, which are the lowest leaves in the canopy.

The initial symptoms of the disease are very tiny (1/32 inch or less) yellow or brown or black spots on both sides of the leaf blade. They are easily missed without close observation. The fungus will emerge from these spots, rupturing the leaf epidermis (leaf surface) (Figure 1). It is the resulting fungal reproductive structures (sori) that are most commonly observed and which obscure any true symptoms.

The sorus (sori is the plural form) is a black fruiting body that is less than 1/16 inch in diameter (Figure 2). As the sorus matures and yellow spores are produced, short, light-colored filaments (thread-like structures) will emerge from the black body (Figure 2). These filaments aid in spore dispersal. Once the spores are dispersed, the sori deflate and appear like a black, cup-shaped body or black crater. You can easily see the sori, but you can also feel the sori with your finger as they are raised above the leaf epidermis. The number of sori indicates the level of infection (Figure 3).



Figure 1.

The small black bodies are sori (fruiting bodies) of *Graphiola phoenicis* that have erupted through the leaflet epidermis. The black spots are symptoms of potassium deficiency, and not *Graphiola* leaf spot.



Figure 2.

Close-up of sori of *Graphiola phoenicis* with filaments protruding.



Figure 3.

Heavy infestation of *Graphiola* leaf spot.

### Diagnosis

This is a disease that can be easily identified by examining the leaf. While the fungus can be cultured, there is no need to do this as the fungus is easily observed with the unaided eye. A simple magnifying glass will provide adequate “close-up” views.

Confusion regarding the seriousness of the problem occurs because most palms grown in the Florida landscape usually exhibit symptoms of nutrient deficiencies on the oldest leaves, the same leaves affected by the fungus (Figures 1 and 4). The yellow and necrotic spotting caused by potassium (K) deficiency is often misidentified as *Graphiola* leaf spot. Similarly, the extensive necrosis on old leaves of *Phoenix* spp. is caused by potassium deficiency and not *Graphiola* leaf spot. In both cases, it is nutrient deficiencies, not the disease, causing the leaf decline affecting palm health.



Figure 4.

Potassium deficiency symptoms and *Graphiola phoenicis* sori on the same leaf.



Figure 5.

Mixed infection of *Graphiola phoenicis* and *Stigmina palmivora* (large brown spots). Note that some *Stigmina* leaf spots have a sorus of *Graphiola phoenicis* within the leaf spot.

### **Disease and Fungal Life Cycle**

After the fungus penetrates (infects) the leaf tissue, it has very limited growth within the leaf tissue, with most growth occurring just below the sorus (black fruiting body). The time span from infection to spore production is 10 to 11 months. This is unusual when compared to most leaf pathogens that have a life cycle often measured in weeks. This means that the active disease being observed today is the result of infection that occurred almost a year ago.

**Source:** <http://edis.ifas.ufl.edu/pp140#.Ubj4wzi3kIc.email>

**Website provided by the University of Florida – Institute of Food and Agricultural Sciences Extension**