

Some Common Diseases of Tahiti Lime in Florida

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Introduction

Tahiti lime is a seedless citrus grown in Florida for fresh market and processing. Most of the commercial acreage is located in the southeastern part of the state, especially in Dade County.

Several diseases are important limiting factors in lime production, if not adequately controlled. These include melanose, alga spot, greasy spot, scab, and *Phytophthora* foot rot. Sooty mold is a common disorder found on limes that greatly resembles a disease problem. The diagnostic characteristics, descriptions of disease development, and measures for control are included in this fact sheet. Due to frequent changes in the availability and use restrictions for specific agricultural chemicals, consult the University of Florida Extension Service for specific, current fungicide recommendations.

Melanose

Melanose (caused by the fungus *Diaporthe citri*) can at times cause significant financial loss, especially if there is substantial fruit blemishing, resulting in downgrading of unsightly fruit to juice production. Distinct melanose symptoms occur on leaves, green wood, and fruit. On leaves, melanose lesions begin as small, dark brown to black sunken spots. As the leaf tissue ages, the spots may be-

come raised (Fig. 1).

Symptoms on young, green twigs are quite similar to those on leaves except that they tend to be distinctly raised.

On fruit, lesions begin as light brown, circular spots that later become brown to black raised pimples (Fig. 2), imparting a sandpaper-like feel to the fruit. If infections become numerous, symptoms appear as large areas of dark, rough scar tissue on the rind.

Spores of the melanose fungus are produced in fruiting structures (pycnidia) that develop only in dead wood. The spores are embedded in a sticky matrix and, for all practical purposes, are released only by splashing rainfall, after which they can infect young leaves, green twigs, and fruit. Subsequent lesions on living tissue do not serve as inoculum sources, since no fruiting structures are formed in them.

Since dead wood is the primary source of melanose spores, removal of dead wood is a significant control factor. It is important to note that serious outbreaks of melanose usually occur after freezes that result in a lot of dead wood in groves.

Copper fungicides are important in controlling melanose, especially those applied during the rainy season.

Algal Disease (Alga Spot, Red Algal Disease)

This disease is caused by a parasitic alga, *Cephaleuros*. This organism has a wide host range among tropical and subtropical trees, but is a particularly serious problem on Tahiti lime. Lesions on leaves are roughly circular, raised, and greenish-gray in color. The alga will eventually produce rust-colored microscopic "spores" on the surface of the leaf spots, giving the spots a reddish appearance (Fig. 3).

The alga may also attack branches, and bark splitting may occur. If wood infections become severe, girdling and death of branches may result. The appearance of the masses of red "spores" on the wood (Fig. 4) is highly diagnostic.

Algal disease became much more prevalent in Florida with the advent of organic fungicides (such as benomyl and the dithiocarbamates). When copper sprays are included in the disease control program, it is usually well controlled. Again, copper sprays in the rainy season, especially in June, are most effective.

Greasy Spot

Greasy spot, caused by the fungus *Mycosphaerella citri*, is a major disease of Tahiti lime. Severe defoliation and subsequent long-term loss of tree vigor can result if it is not adequately controlled.

Infection of new leaves occurs from invasion by spores released in diseased and decomposing lime leaves on the grove floor. Since the decomposing leaves require alternate periods of wetting and drying for spore release, most infection probably occurs in the summer.

Fungal invasion occurs through stomates on the underside of the leaves. The symptoms begin as small, localized water-

logged areas on the underside of leaves that subsequently blister. These undersurface areas then begin to turn orange to light brown (Fig. 5) with yellowing of the upper leaf surface. With time, infections turn dark brown to black, with a definite greasy look (Fig. 6). Infected leaves very often drop prematurely. Fruit infection can occur in Tahiti lime, but does not seem to be that common.

Effective control of greasy spot can be obtained with sprays of copper, benomyl, (resistant strains to benomyl exist) or benomyl plus oil. When greasy spot levels are low, oil alone maybe sufficient. Homeowners should benefit from a sanitation program aimed at cleaning up and removing fallen, infected leaves from around the base of their lime trees. See Plant Pathology Fact Sheet No. 9 for a more detailed description of citrus greasy spot.

Scab

Scab is caused by the fungus *Elsinoe fawcetti*. Tahiti lime is not as susceptible to scab as some other citrus. However, sporadic outbreaks can cause economic loss. The disease is most common in groves where Tahiti lime has been grafted onto rough lemon rootstock. Rough lemon is extremely susceptible to this fungus and inoculum can build up on suckers arising at the base of the tree.

Infections in lime leaves appear as light-colored, raised areas. Severely infected leaves are distorted. Infections of fruit appear as prominent, light-colored, raised areas (Fig. 7) that throw fruit out of grade.

Cultural controls are very important in management of scab. If rough lemon has been used as the rootstock, emerged lemon sprouts must be promptly pruned out. Use of marcots (airlayers) will, of course, eliminate the rough lemon problem. Copper and benomyl sprays are also recommended.

Phytophthora Foot Rot

Foot rot is a soilborne fungus disease caused by either *Phytophthora citrophthora* or *Phytophthora parasitica*. The latter fungus is particularly widespread in the rock soils of Dade County. These fungi damage trees by invading woody tissue at or below the soil line.

The most serious aspect of this disease occurs when *Phytophthora* invades at the tree base, producing large cankers (Fig. 8). Trees become chlorotic, and dieback begins.

Rough lemon rootstock is susceptible to foot rot; the incidence of the disease is noticeably lower in marcot trees and those trees on *Citrus macrophylla* rootstock. Under flooding conditions the feeder roots of lime trees may be attacked by these fungi, resulting in a root rot. Severe infection may kill trees.

Control of foot rot is primarily cultural. It is important to prevent disease entry into groves by strict sanitation in the propagation nursery. Injuries to tree trunks should be

avoided, because they can be sites for fungal entry. Weeds should be adequately controlled to prevent moisture from building up around tree trunks.

Sooty Mold

Sooty mold is not, strictly speaking, a “disease” of lime, since it does not involve the invasion and colonization of the host by a pathogenic microorganism. Instead, it is a reflection of an attack by pest insects, especially the citrus whitefly. While whiteflies and related insects feed on lime leaves and fruit, they secrete a thick, sweet, sticky honeydew that is promptly invaded by the sooty mold fungi. The result is a black discoloration (due to the color of the fungi) over leaf (Fig. 9) and fruit surfaces. An observer can usually identify sooty mold, because it will rub off on the fingers.

It is thought that sooty mold has little, if any effect on the general health of the lime tree, and it is considered of economic importance only when the black growth builds up to a point where it cannot be easily cleaned off fruit at the packinghouse.

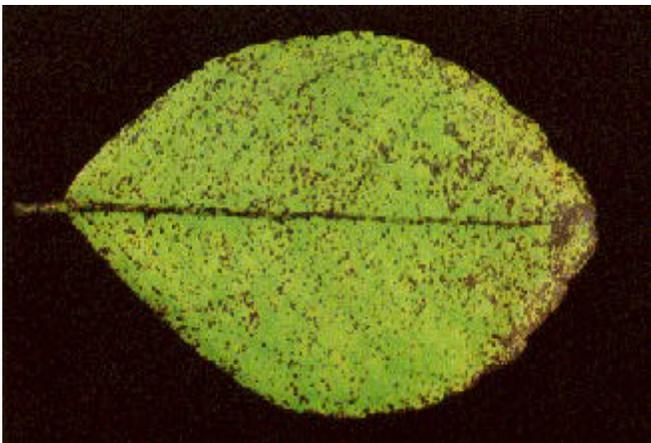


Figure 1. Sandpaper-like spots of melanose on underside of lime leaf.



Figure 2. Raised, black melanose lesions in lime fruit.

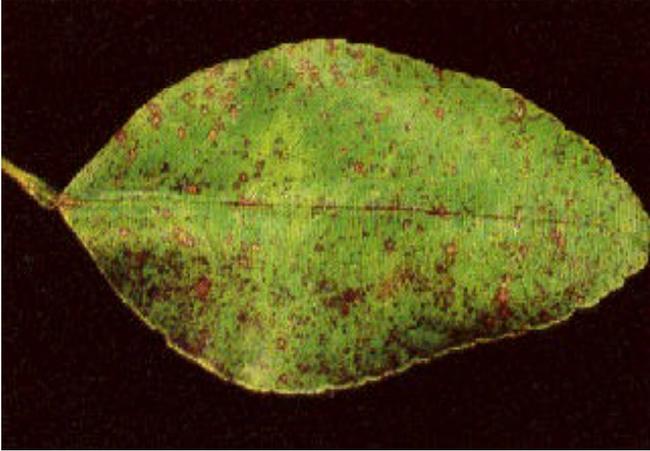


Figure 3. Algal disease in lime leaf.



Figure 4. Heavy "spore" production by *Cephaleuros* (algal disease pathogen) on bark of lime tree.



Figure 5. Earlier stages of greasy spot leaf infection.



Figure 6. Advanced stages of greasy spot infection.



Figure 7. Typical, light-colored, raised scab infection on lime fruit.



Figure 8. Prominent cankers at base of lime tree with *Phytophthora* foot rot.

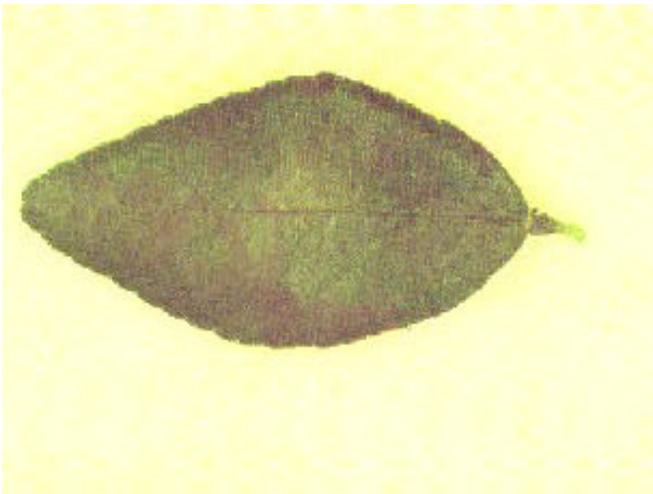


Figure 9. Sooty mold on lime leaf, resulting from invasion of whitefly honeydew by the black sooty mold fungi.