Diseases of Pittosporum in Florida

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Pittosporum tobira (Thunb.) Ait. (Japanese Pittosporum), *P. tobira* Ait. cv. *Variegata,* and *P. tobtra* cv. *Wheeleri* are used in Florida as outdoor landscape plants, as products of woody ornamental nurseries and as cut foliage. Pittosporum tolerates shade to full sun, freezing temperatures and relatively high soluble salts levels. In many growing situations, pittosporum are subject to pests and diseases which attack leaves, stems and roots. The most common diseases of pittosporum are angular leaf spot, Rhizoctonia aerial blight, Southern blight, root rots and dieback.

Angular Leaf Spot

Angular leaf spot, caused by *Cercospora pittospori* Plakidas, was first described in 1949 and is common in field and landscape plantings of pittosporum that are not routinely sprayed for its control. Symptoms of angular leaf spot are light-yellow to pale-green and tan angular spots, developing first on upper leaf surfaces (Fig. 1). Leaf spots have straight borders (angular) due to the restriction of fungal growth through the leaf by veins and veinlets. Leaf lesions (Fig. 1) commonly have indistinct margins, with spot patterns similar on the leaf undersides as well. Severe infections on immature leaves occasionally result in leaf distortion and may cause severe drop of lower leaves. The key to recognition of this leaf spot is the characteristic angular shape. Loss in production of high quality foliage is important in the cut foliage nursery, since cuttings may be unsalable when infected with C, pittospori.

Warm, wet weather favors leaf spot development. Weekly applications of fungicides may be necessary to control this disease. Since *C. pittospori* produces spores solely from the lower leaf surface, it is extremely important that all fungicides be applied evenly to **both** leaf surfaces for rapid and effective control. Consult your nearest County Extension Office for the latest fungicide recommendations for the control of angular leaf spot and other diseases discussed in this publication;

Alternaria Leaf Spot

Alternaria leaf spot of pittosporuin is caused by *Alternaria tenuissima* (Fr.) Wiltsh. This disease was first noted in the early 1960s in Florida. Early stages of Alternaria leaf spot may resemble angular leaf spot; however, as lesions develop, the diseases become distinctly different. With Alternaria leaf spot, irregularly shaped, chlorotic spots are scattered over the leaf surface. These spots later develop necrotic centers which are usually absent in angular leaf spot disease. Spots caused by *A. tenuissima* are typically rounded, have tan to dark-brown centers and generally are smaller (I to 3 min) than those caused by *C. pittospori.* Alternaria lesions are frequently surrounded by yellow halos and their centers are slightly depressed. Symptoms

on immature leaves often result in distortion, giving leaves a crinkled appearance (Fig. 2).

This disease is found less commonly in cut foliage production facilities, nurseries, and in the landscape than is angular leaf spot, but it can be very damaging when it does occur. Some fungicides for control of leaf spots on pittosponim are effective for both angular and Alternaria leaf spot diseases; others are not. Obtain an accurate disease diagnosis from your local County Extension Office or a commercial laboratory prior to choosing a fungicide. Fungicide applications can be extremely important during the wet, warim portions of the year when conditions for leaf spot development are optimum. Producers of potted pittosporum may be able to avoid these foliar diseases by growing plants under solid structures that eliminate much of the free water on leaves which is necessary for leaf spot development. Use of daytime irrigation cycles may also reduce foliar disease severity by decreasing the amount of time that leaves stay wet.

Producers of woody ornamentals should pay particular attention to foliar disease control on those pittosporum that are destined to be stock plants. New growth should be free from leaf spots prior to taking softwood cuttings. Both angular and Alternaria leaf spots can be damaging in the propagation bed and on newly rooted liners set out in the nursery.

Rhizoctonia Aerial Blight

The most severe leaf spot of pittosporum is caused by either *Rhizoctonia ramicola* Weber & Roberts, reported in 1951, or *R. solani* Kiiehn, reported in 1982. In many cases, this disease may more accurately be referred to as aerial blight and has been commonly named silky threadblight (*R. ramicola*). Aerial blight is initially characterized by small, tan, irregularly shaped spots, usually surrounded by purplish margins. Spots frequently reach one centimeter in diameter (Fig. 3) and can encompass the entire leaf. *Rhizoctonia* spp. inhabit the soil and thus cause spots on lower leaves first. The fungus can spread into upper portions of plants when conditions are favorable. Leaves curl into a cylinder in severe cases and become matted by the threadlike mycelium of the fungus (thus the common name, silky threadblight).

Recently, aerial blight of pittosporum was shown to be the same as aerial blight of *Rumohra adiantiforints* (G. Forst) Ching. The pathogen spreads easily from one plant genus to the other, and special care must be taken to provide control on both pittosporum and leatherleaf fern. Aerial blight of pittosporum is most serious in the summer months when hot, wet conditions prevail, stimulating the fungus to grow from the soil and crop debris into the plant canopy. Trim severely infected tissues prior to the application of a recommended fungicide.

In cases of severe disease pressure, steins of pittosporum may also becorne infected with *R. solani.* The most common infection site is a wound, created during the harvesting of' shoots for cut foliage sale. Unless measures are taken to protect the open wounds, this fungus and many other fungi can invade the tissue and cause dieback.

Galls, Dieback and Stem Blights

The most common genera of organisms causing stem galls and twig death include *Agrobacterium, Diaporthe, Diplodia, Nectriella*, *Phomopsis* and *Sphaeropsis*. Some of the organisms form a black layer of fungal tissue under the bark, which usually sloughs off (Fig. 4). The major route of entry of these pathogens is through pruning wounds. Fungi may be introduced into wounds on cutting instruments and by spore movement aided by wind or water. Cold winter seasons and/or the use of thick mulch layers may cause stem injury typified by one-sided splits in the bark on limbs or in forks of branches. Cold temperatures can kill the cambial layer along these splits, exposing

the internal plant tissues to dieback organisms.

Galls often girdle stems, resulting in twig death. Pruning infected areas carefully eliminates spread to adjacent tissues and is a recommended practice. Excise affected plant parts several inches below obvious external symptoms to stop the advancing growth of the dieback fungus.

Sooty molds and lichens are commonly mistaken as a cause of diebacks on pittosporum and other ornamentals in the landscape. Sooty mold fungi form a brown-to-black sooty film on leaves and branches of pittosportun, but they do not cause disease. These fungi subsist on the honeydew excrement of insect pests (e.g. aphids, mealy bugs, whitefly, scale, etc.). One should view sooty molds as indicators of potential insect pest problems rather than dieback-causing organisms. The lichens are symbiotic life forms composed of a fungus and an alga in a complex relationship. These organisms may grow on branches or stems of pittosportim in moist, shady locations, but do not cause disease. Lichens are variable in color and may appear as leaflike, crustlike, or raised structures on woody tissues of many plant species in Florida.

Mushroom Root Rot

Some organisms cause a severe dieback problem in the absence of obvious wounds. The appearance of the bark is blistered and slightly discolored and may show evidence of fungal growth of various types. The most common problem is mushroom root rot. The fungal pathogen rots not only the roots of infected pittosporum but also infects the main stem at the soil level, causing girdling and eventual plant death. The mycelium of *Armillariella tabescens* (Scop. ex Fr.) Singer, the causal fungus, can often be seen underneath the bark at the base of an infected plant as a white coating extending from the soil up into the main stem and also along major roots.

During warm, wet weather, the mushroom stage of *A. tabescens* may appear near the stem of the affected plant. These mushrooms emerge in groups of clumps and are honey-to-amber in color, about 1 to 2 inches (2.5 to 5.0 cm) tall, with a 0. 5 to 1. 5 inch (1.25 to 3.75 cm)-wide cap. This stage usually does not appear until after the plant has been killed.

Mushroom root rot is controlled by removal of infected plants, since there are no fungicides which significantly alter development of this disease once it starts. Avoid planting amid or above oak debris, since oak species are native hosts for *A. tabescens* in Florida. Thoroughly excavate planting sites along house foundations where tree stumps and debris are often buried during house construction. When mushroom root rot occurs in a hedge or circle planting, consider the removal of adjacent plants as well as the affected one in an effort to stop lateral spread of the fungus. Since *A. tabescens* spreads through root grafts as well as directly through soil, additional plant loss can be expected unless all infected plants are removed simultaneously. Remove all root debris (screening soil if necessary) and follow with a planting site soil fumigation prior to replanting.

Corticium Limb Blight

Another serious dieback disease is caused by *Corticium salmonicolor* Berk. & Br., a basidiomycete fungus. Symptoms are typical of dieback, with the exception that the bark appears a pinkish-orange color around the infection site. These sites occur anywhere on plants. Removal of the bark reveals a discolored area in the vascular system which can be confined to the cambium or spread internally into older woody tissue (Fig. 5). In severe cases, infected twigs and branches are characteristically wilted and the infection may extend completely through the stem and result in plant death (Fig. 6). As with mushroom root rot, there is very

little which can be advised for control of this disease. Once symptoms are detected, removal of infected areas and strict sanitation are necessary. Prime 4 to 6 inches (10 to 15 cm) below external symptoms of disease and remove all prunings from the growing site. Check other susceptible woody species, such as loquat and fig, that may be in the landscape.

Rough Bark Disease

Rough bark disease of pittosporum believed to be caused by a virus. Infected plants typically have a roughened bark, and stems may be girdled and swollen, causing death of twigs or branches above that point (Fig. 7). The entire plant may be stunted in severe infections. Leaves at tips of infected branches appear distorted and may have chlorotic or yellow areas of indefinite, shape. Sometimes, these spots resemble early stages of angular leaf spot. The causal agent is transferred between plants on cutting instruments. Removal of infected plants and sterilization of cutting tools between plants is required to control spread of this ‘ disease. Diseased plants should never be used for propagation, since the causal agent may be present in cuttings and the problem would be perpetuated.

Southern Blight

Southern blight (stem rot, Southern wilt, or Sclerotium rot) is caused by *Sclerotium roffisii* Sacc. and is a serious disease of pittosporum and many other ornamentals.

Symptoms of this disease are wilting, stem rot, and eventual death. Rotted tissue and white wefts of coarse fungal mycelium Occur on the plant base at the soil line (Fig. 8). Under optimum conditions for disease development (hot and humid), the mycelium may extend over-a large portion of the infected plant (usually dead at this point), and muslard seed-sized brown sclerotia form. These sclerotia allow the fungus to persist in Florida soils for a number of years.

Plants grown in the ground or in pots on the ground are especially susceptible to this disease. Infected plants may serve as a source of inoculum for nearby plants and can even result in contamination of the ground if moved around a nursery. After removal of the infected plant, the ground should be sterilized to prevent infection of new plants. Treat soil either with heat or with various multipurpose chemical soil fumigants according to recommendations and label instructions. Few fungicides have activity against this fungus. Consult your County Extension Office for additional information.

Root Rots

Root rot of pittosporum is caused by *Pythium* spp. or *Rhizoctonia* spp. Root rot is most severe when plants are grown in wet, poorly drained soil. Declining plants may lose leaves suddenly or over a period of time, beginning at the base of the plants (Fig. 9). Leaves may also be smaller and chlorotic, since roots have reduced ability to transfer nutrients from the soil. Roots of infected plants are often black and/or soggy. Pythium root rot typically causes a sloughing Of Outer root layers, leaving only the central core intact. In both root rots, small feeder roots are usually absent from severly infected areas.

Careful water management in planting sites is a valuable aid in controlling these rots. Where soil drainage is a persistent problem, set plants into raised beds and avoid planting directly beneath the drip line of the house, or downslope from a driveway or sidewalk where excessive water will persist. Always obtain an accurate diagnosis of a root problem, since the pesticides used for root rot control may differ. Root knot nematode also commonly infects pittosporum, and since the symptoms above ground are similar to root rot diseases, the roots must be examined for characteristic nematode

galling. Submit galled roots and a pint of soil to your local County Extension Office or commercial laboratory for nematode diagnosis.

New Disease Alert

A new leaf spot disease *of Pittosporum tenuifolium* has been described in Europe, but it has not been noted in Florida. Symptoms of this leaf spot, caused by *Phomopsis pittospori* Archer, are small (3 to 6 turn), dark-brown to black, circular to elliptical spots which often coalesce. The disease is most severe on young plants. Phomopsis leaf spot has riot been found on *P. tobira*, but other *Phomopsis* spp. are commonly associated with dieback of this plant.

Another leaf disease of' *P. tobira* is caused by a virus and has only been reported in Italy. Symptoms caused by this virus are primarily lightening of leaf veins kind occasional curling and puckering of immature leaves. Do not propagate from plants showing these symptoms, unless the symptoms are known to be caused by other factors.

Figure 1. Typical symptoms of angular leaf spot of variegated pittosporum caused by *C. pittospori*.

Figure 2. Alternaria leaf spot can result in high quality loss of shoots due to distortion of new leaves, and necrotic, reddish-brown lesions scattered over the leaf surface.

Figure 3. Severe infections of Rhizoctonia aerial blight can result in defoliation and matting of infectedleaves well above ground level.

Figure 4. Fungal infection of pittosporum wood, showing black growth of fungus under bark.

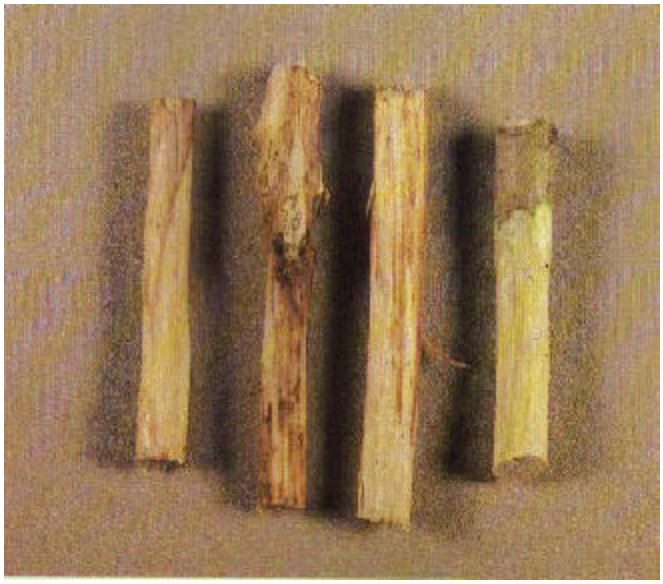

Figure 5. Pittosporum branches infected with *Corticium salmonicolor,* showing discolored cambial layer below the bark (middle two). Advanced infections extend well into the wood (far left). The far right branch shows healthy cambium and wood tissue

Figure 6. Corticium limb blight of pittosporum showing dieback and wilt.

Figure 7. Rough bark disease of pittosporum is believed to be caused by a virus. Severe infections result in girdling of stems and dieback.

Figure 8. Southern blight of pittosporum showing the coarse white mycelium advancing up the stem from the soil line.

Figure 9. Root rot fungi of pittosporum plant on left, showing chlorosis, wilting and an overall decline in plant vigor.