

Citrus Diseases Exotic to Florida: Powdery Mildew¹

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Citrus is susceptible to a large number of diseases caused by plant pathogens. Economic losses from plant diseases can be severe, but fortunately, not all pathogens attacking citrus worldwide are present in Florida. Any exotic disease, if introduced, has the potential to significantly increase production costs and thus decrease profitability for Florida growers. The background information for each exotic citrus disease is presented in a series of EDIS fact sheets (http://edis.ifas.ufl.edu/topic_series_citrus_diseases_exotic_to_florida) to provide a basis for evaluating exotic pathogens that may pose potential risks to Florida citrus and to facilitate a decision-making framework for preventing their introduction and spread. This paper discusses powdery mildew caused by *Oidium* species.

Powdery mildew, which affects almost all citrus cultivars, is a common fungal disease problem in Asian countries. It has been reported in Central and South America and occasionally in California, but it has not become a major problem in these areas. The disease has never been reported in Florida. Damage is frequently seasonal in areas where the disease is endemic. It is primarily a foliage problem, although young fruit can be infected and fruit drop may occur. Powdery mildew can be controlled by properly timed fungicides, but this adds to production costs. Preventing powdery mildew from entering Florida is much easier than trying to eradicate or control it once introduced.

Host range and symptomatology. Most citrus cultivars and species can be affected to some extent by powdery mildew, but differences in host susceptibility have been observed in different countries. Oranges and mandarins are the most

susceptible hosts. Limes, lemons, grapefruit, and pummelos are affected and show variable reaction in different citrus-growing areas. Symptoms include whitish powdery patches that appear most frequently on young leaves (Figure 1) but may also appear on young stems and fruit (Figure 2). Powdery mildew is more severe in humid subtropical areas and often occurs in nurseries, shady orchards, and poorly ventilated locations. The disease primarily affects new, flush growth, resulting in leaf and shoot discoloration. When infection is severe, leaf drop, twig dieback, and premature fruit drop may occur.



Figure 1. Powdery mildew on mandarin leaf.
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Figure 2. Powdery mildew on mandarin young fruit.
Credits: Paul Holford, University of Western Sydney, Australia

Causal agent. Two species of the fungus *Oidium*—*O. tingitaninum* and *O. citri*—have been identified as causes of powdery mildew on citrus. These species differ somewhat in conidial (asexual spore) morphology but have similar effects on the host. *Oidium* species are obligate parasites that only grow on living host plants and often do not kill their hosts.

Transmission and epidemiology. In general, powdery mildew problems occur during periods of cool, damp weather. Temperatures around 20°C (68°F) and long periods of high relative humidity (> 80%) with mists and fog are especially conducive for sporulation, spore germination, and infection. Mildew symptoms are frequently more severe on lower branches and those in the interior of the canopy. Conidia (asexual spores) are airborne but do not survive long periods in an arid environment. Only young tissue is susceptible, and infections occurring between September and November are largely due to scattered flushes of new growth.

Detection and control. Symptoms of powdery mildew are conspicuous and easily recognized in the field. Incubation of infected tissue in a moist chamber may be required for production and observation of conidia. Powdery mildew can be controlled by a variety of fungicides, but those used as protectants must be properly timed to protect emerging new growth. Systemic fungicides can provide longer protection. Powdery mildew is unlikely to cause significant losses in production of processing fruit in Florida, but little is known about the susceptibility of Florida cultivars to powdery mildew. In addition, there are no fungicides registered specifically for powdery mildew in Florida.