

Downy Mildew on Impatiens

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Downy mildew on impatiens is currently a concern in Palm Beach County. High humidity paired with cool nights created the perfect conditions for disease development. Downy mildews are caused by a variety of



Figure 1. Symptoms of downy mildew affects newer growth first: leaf edges curling downward. Photo: UF Laura Sanagorski

pathogens that tend to be specific to hosts; however *Plasmopara obducens* is the one that affects impatiens. Some literature indicates that downy mildew favors about 50 - 72 degrees Fahrenheit nighttime temperatures.

HOSTS - Downy mildew affects all hybrids and varieties of *Impatiens walleriana*, also called Busy Lizzy. New Guinea impatiens, *Impatiens X hawkeri*, is considered very tolerant. Counties adjacent to Palm Beach County have reported less severe outbreaks in 2011 and early 2012.

SYMPTOMS- Young plants and new growth are most susceptible and may show symptoms first. Initially, leaves may look a little yellowish or speckled. In fact, these symptoms look very similar to nutritional deficiencies. You may see faint gray lines on the tops of leaves or notice leaf edges curling downward. Sometimes the yellowing is not visible before leaf curling begins.

As the disease continues to progress, whitish downy looking growth will be visible on undersides of leaves. This whitish growth is spore-containing structures that have emerged from the lower leaf pores



Figure 2. Lower surfaces of leaf with white mycelia growth. Photo: UF Laura Sanagorski

(stomata). Next, leaves and flowers will drop quickly, leaving mostly stems.

LIFE CYCLE of the DISEASE - The pathogen that causes downy mildew is a type of water mold and is classified as more closely related to algae than to fungi. Other similarly classified pathogens include *Phytophthora* spp. and *Pythium* spp. Downy mildew can spread by two different types of spores. One type, zoospores, moves through water. They are also easily windborne when contained in a larger structure called a sporangium. This explains why this disease is spread by splashing overhead irrigation, rainfall and wind. The other type of spores, oospores, forms inside plant tissues where they can survive for years. Downy mildew is very aggressive and can rapidly spread, so be sure to act quickly if you spot it.

LANDSCAPE MANAGEMENT - This pathogen may erupt under high humidity, cool temperatures, and overcrowding. Overcrowding reduces the wind movement between plants that helps dry leaves more quickly. Prevention is the only effective management strategy. Elimination of overhead and nighttime watering, excessive fertilization, overcrowded planting beds, and other stresses on the plants would all be very helpful in avoiding or reducing occurrence of this pathogen. However, our tightly arranged mass planting practices in the



Figure 3. Symptoms of downy mildew: downy growth on lower leaf surface and mottled discoloration on upper leaf surface. Photo: UF Laura Sanagorski

landscape, irrigation systems, and periodic rainfall make this difficult to achieve. Be sure to carefully inspect impatiens leaves and stems purchased for the landscape before they are installed to help ensure that affected plants are rejected. Once in the landscape, the plants can be attacked by windborne spores, but it is always better to avoid bringing the pathogen in on plant materials.

Chemical treatments can be expensive and do not provide much curative function. They are much more effective when applied preventively. Quickly remove and dispose of plants or branches that appear to be affected by early symptoms of downy mildew. Follow quickly with recommended protective fungicide treatments. Be sure to fully remove as much plant tissue as possible from these beds in the spring when impatiens are changed to other flower varieties to avoid oospores surviving until the next time impatiens are planted. For replacement in heavily infested beds, consider selecting a resistant flower species or another type of plant.

See Table 1 below for recommended professional fungicides to help manage downy mildew in the landscape.

NURSERY MANAGEMENT – It is critical that high levels of sanitation be maintained in the nursery. Carefully inspect plugs or any other *Impatiens walleriana* plants brought into the nursery and reject any that appear to be affected by the pathogen. Sanitize hard surfaces in the growing area between crops with quaternary ammonia compounds. Remove all impatiens plant tissue between crops and do not compost on the nursery property. Dispose of in dumpsters that are emptied offsite from the nursery property.

Scout frequently for this pathogen, especially as evening temperatures cool. Our high relative humidity makes this variable extremely difficult to control. Space plants to allow as much air movement between them as possible to hasten leaf drying after irrigation or rainfall.

If affected plants are detected, quickly remove them and any fallen leaves and flowers from growing areas and dispose offsite away from the nursery property. Treat remaining plants with preventative fungicides as indicated in Table 1 below. Wash hands thoroughly after handling problematic plants and before handling non-affected impatiens.

NON-COMMERCIAL HOMEOWNER RECOMMENDATIONS – follow landscape management recommendations as indicated above and utilize fungicides as indicated in Table 2 below.

Table 1 – Commercial Fungicides for Use in Managing Downy Mildew on *Impatiens walleriana*.

Commercial Landscape	Nursery	Greenhouse
Adorn (fluopicolide)	Adorn (fluopicolide)	Adorn (fluopicolide)
Aliette (fosetyl-Al)	Aliette (fosetyl-Al)	Aliette (fosetyl-Al)
Heritage (azoxystrobin)	Heritage (azoxystrobin)	Heritage (azoxystrobin)
Pageant (pyraclostrobin + boscalid)	Pageant (pyraclostrobin + boscalid)	Fenstop (fenamidone)
Protect (manganese + zinc + ethylenebisdithiocarbamate)	Protect (manganese + zinc + ethylenebisdithiocarbamate)	Pageant (pyraclostrobin + boscalid)
Segway (cyazofamid)	Segway (cyazofamid)	Protect (manganese + zinc + ethylenebisdithiocarbamate)
Vital (potassium phosphite)	Stature (dimethomorph)	Segway (cyazofamid)
		Stature (dimethomorph)

Additional Notes:

Rhapsody (*Bacillus subtilis* strain QST 713) may also provide protection against some forms of downy mildew in Florida landscapes, nurseries and greenhouses when applied prior to infection.

Subdue Maxx (mefenoxam) may also provide protection against some forms of downy mildew in Florida landscapes, nurseries and greenhouses.

Soilguard (*Gliocladium virens* G1-21) may also provide protection against some forms of downy mildew in Florida nurseries and greenhouses when applied prior to infection periods.

Orvego (ametoctradin + dimethomorph) a BASF product should be available for Florida landscapes and nurseries by July 2012, according to the company.

Table 2 – Fungicides for Use in Managing Downy Mildew on *Impatiens walleriana* in home landscapes.

Non-Commercial Homeowner Products
Concern Copper Soap Fungicide (copper octanoate)
Ferti-lome Broad Spectrum Landscape and Garden Fungicide (chlorothalonil)
Monterey Agri-Fos (phosphorous acid)
Ortho Max Garden Disease Control (chlorothalonil)
Southern Ag Liquid Copper Fungicide (copper ammonium complex)
Southern Ag Triple Action Neem Oil (extract of neem oil)

Remember, the label is the law; be sure to use products only in a manner consistent with the manufacturer directions on the labels. Please use pesticides safely.

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