

Impatiens Downy Mildew: Guidelines for Growers

Quick Facts

Common Name Impatiens downy mildew

Scientific Name *Plasmopara obducens*

Plants affected *Impatiens walleriana*

Primary symptoms: light-green yellowing or stippling of leaves, leaves curl downward at the margins, white downy-like growth on underside of leaves, stunting, leaf and flower drop

Background

Impatiens downy mildew is a destructive foliar disease of *Impatiens walleriana* that is capable of causing complete defoliation or plant collapse, especially in landscape plantings under moist conditions and cool nights.

Regional outbreaks of this disease were seen for the first time in landscape beds and container plantings in North America in summer 2011. In early January 2012, outbreaks of impatiens downy mildew were observed in landscape beds and greenhouses in south Florida. By the end of the 2012 season, impatiens downy mildew had been confirmed in 34 states. However, the occurrence and timing of when the disease showed up within a geographic region was highly variable. In early November 2012, outbreaks were again seen in south Florida landscapes signaling the start of a new cycle of disease for the 2013 season. In 2013, the distribution of the disease was similar to the previous two years, with the addition of infected landscape beds in regions of Colorado, Kansas and Utah. In most regions of the country the occurrence of the disease in 2013 was late in the season, similar to what was observed in 2011. Each year since, the disease has been observed in landscapes across the United States and lower Canada. The occurrence is generally earlier in the southern states (November-February) and later in the northeast and upper midwest (August-October). However, reports of impatiens downy mildew have decreased each year. This may be due to healthier impatiens going into the landscape due to grower prevention, fewer impatiens being planted into the landscape, as well as better recognition of the disease and fewer plants submitted to clinics for diagnosis.

Young plant and finish growers are at an increased risk for this disease if:

1. Located in region where production of *I. walleriana* coincides with plantings of *I. walleriana* growing in the landscape.
2. Source of incoming liners and plugs from region where infected impatiens currently growing or have been reported in landscape.

Hosts

- ✓ All cultivars of *Impatiens walleriana* (common garden impatiens) and interspecific hybrids with an *I. walleriana* parent are susceptible including Fusion, Fiesta and Patchwork.
- ✓ A few wild species of impatiens are also susceptible; however, there are no other bedding plant species that are known hosts.
- ✓ Both vegetative propagated and seed-raised *I. walleriana* are susceptible but there is NO EVIDENCE of seedborne transmission of *P. obducens*.
- ✓ New Guinea impatiens (*Impatiens hawkeri*) including Fanfare, Divine, Celebration, Celebrette, and Sunpatiens have high resistance to this disease.

Spread

Sporangia (sac-like structures filled with zoospores) produced on the underside of infected leaves are easily dislodged and can be spread short distances by water splash, and longer distances by air currents.

Quick Tips

- Train your staff to recognize early symptoms of downy mildew
- Inspect liners and plugs on delivery
- Apply fungicides preventively
- Scout frequently, turning leaves over to look for white sporulation
- Minimize greenhouse humidity and limit leaf wetness <4-5 hr, especially at night

Overwintering

Oospores (overwintering structures) can be produced in infected, collapsing stem and leaves. There is still limited evidence that the oospores overwinter in landscape beds and infect impatiens the following year. Research is continuing to understand the role that the oospores may play in year-to-year survival and spread. However, the pathogen can survive during the winter months on living impatiens plants growing in warmer regions of the country (Florida). The aerial spores can then potentially move north during the following growing season infecting impatiens along the way.

Two potential routes for entry into a greenhouse facility:

1. infected plant material (plugs, cuttings, liners)
2. wind-dispersed, aerial spores from infected plants growing elsewhere (may potentially travel on the order of hundreds of miles).

Symptoms

Young plants and immature plant tissues are especially susceptible to infection. Symptoms are often first observed on terminal growth. Seedling cotyledons are highly susceptible to infection.

Early symptoms include:

- ✓ Light-green yellowing or stippling of leaves
- ✓ Downward curling of infected leaves
- ✓ White downy-like fungal growth on the undersides of leaves



Advanced symptoms include:

- ✓ Stunting in both plant height and leaf size when infected at an early stage of development
- ✓ Leaf and flower drop resulting in bare, leafless stems
- ✓ Infected stems become soft and plants collapse under continued wet and cool conditions (more likely to see in landscape plantings)



Impatiens Downy Mildew Fungicide Rotation

Application No./Interval	FRAC Code	Fungicide	Method	Rate /100 gal
1 Cuttings	43+M3	Adorn + Protect DF + Capsil	Spray	2 fl oz +2 lb + 6 fl oz
Plugs (or cuttings as soon as rooted)	43+4	Adorn + Subdue MAXX (if Adorn was NOT applied to cuttings)	Drench	1 fl oz +1 fl oz
	4+33	Subdue MAXX + K-Phite 7LP T/O (if Adorn was applied to cuttings)	Drench	1 fl oz + 4 pt
	U15	Segovis* (not in CA or NY) (if supplier applied Subdue MAXX prior to ship) *not approved in all states; verify registration	Drench	2.5 fl oz
2 (14 days after drench) (7 days after spray)	40	Stature SC	Spray	12.25 fl oz
	40	Micora	Spray	8 fl oz
3 (7 days after spray)	11+7 +M3	Pageant + Protect DF + Capsil	Spray	18 oz + 2 lb + 6 fl oz
4 (7 days after spray) (final application)	4+43	Subdue MAXX + Adorn (6 wk after last drench)	Drench	1 fl oz + 1 fl oz
		Subdue MAXX + K-Phite 7LP T/O	Drench	1 fl oz + 4 pt
		Segovis* (not in CA or NY) *not approved in all states; verify registration	Drench	2.5 fl oz
(rotation application)	21	Segway	Spray	3.5 fl oz

Rotate among fungicides with a different mode of action (FRAC code)

Chemical Control

Preventive application is critical. Control is nearly impossible once sporulation has occurred in a growing facility.

- ✓ **Plugs: inquire with supplier per prior treatments; make first fungicide application at transplant; drench applications provide longer control**
- ✓ **Unrooted cuttings: make first fungicide application within 7 days of receipt and then drench as soon as rooted**
 - **Under low disease pressure or low risk (and if you have drenched):** Reapply foliar applications at 14-day intervals with different FRAC code product
 - **Under high disease pressure (growing at a time impatiens are in the landscape) or high risk (or if you have not drenched):** 7-day intervals with foliar applications may not be sufficient due to limited residual activity
- ✓ **Drench again 6 weeks after first drench application if plants still onsite (or 4 wk if using 0.5 fl oz/100 gal Subdue MAXX)**

**** Fungicide resistance has been documented in populations of *Plasmopara obducens*. Resistance has been observed to Subdue MAXX, Adorn, Pageant, and K-Phite. However, the populations are not static and these products may still work very well but should be tank-mixed and/or rotated with other fungicides with a different mode of action.**

Cultural Control

- ✓ Minimize greenhouse humidity and leaf wetness (<4-5 hr)
- ✓ Frequently scout crop, with particular attention to early leaf symptoms
- ✓ Remove symptomatic plants and any fallen leaves immediately
- ✓ Bag plant(s) and seal before carrying out of greenhouse; do not compost