

Impatiens Downy Mildew – A Review

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Impatiens downy mildew, caused by the pathogen *Plasmopara obducens*, has been a hot topic of conversation since last fall and the issue has been covered widely and in great depth. Here I will offer a quick review as well as updated treatment suggestions.

A Quick History of the Disease in the US

In the US, impatiens downy mildew was only seen as a greenhouse problem since 2004, with sporadic, though managed, cases. Until 2009, this disease had not been identified in landscapes until it was seen in Saratoga Springs, NY in both 2009 and 2010.

Throughout late summer and fall of 2011, there were a number of landscape sightings from around the nation (in CA, CT, IL, IN, NY, MA, MN, OH and WI). South Florida residents saw downy mildew on landscape impatiens beginning in December 2011. In some cases the symptoms were dramatic, with the disease causing complete collapse of large plantings. In 2012, the disease was again seen in the landscape, though much earlier in the season. Cases of impatiens downy mildew were reported in nearly every state from the east coast to the mid-west and the western

coast states. In some areas, particularly in droughty parts of the country, the disease was not widespread, though in many others the effects were devastating, resulting in numerous landscape failures and replanting.

Symptoms and Signs

Early symptoms can be very subtle. A slight stippling or chlorosis can be observed on leaves, and leaves can flag or curl downward. Under humid conditions, a coating of white-colored sporulation will be seen on the undersurfaces of some leaves, sometimes even before any symptoms appear. Sporulation may not always be present or easy to find; leaves should be closely inspected. Suspicious leaves or plants can be put in a plastic bag with a moist paper towel and monitored after 3-5 days for signs of sporulation. If infected when young, plants will appear stunted; in advanced stages, plants will drop their leaves and flowers and the stems will collapse.

A video of an impatiens plant from exposure to plant collapse can be viewed here: <http://www.youtube.com/watch?v=sf-23GoMd3I>. The video covers a five-week period during summer 2012.



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above: Sporulation on undersides of the leaves

left: Leaf chlorosis and leaf curl symptoms.



right: Leaf drop caused by impatiens downy mildew. (Photo courtesy of Margery Daughtrey)



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Hosts

All seed and vegetative cultivars of *Impatiens walleriana* are susceptible, including double impatiens and mini-impatiens as well as any *I. walleriana* interspecific hybrids (Fusion®, Butterfly® impatiens).

There have been varying conversational reports that certain colors will withstand the disease longer than others. However, there is no evidence that any *I. walleriana* cultivar is partially or completely resistant; all can become infected and, under the right conditions, be killed by the disease.

In addition, *I. balsamina* (balsam impatiens or garden balsam) is susceptible; however, symptoms appear as discrete leaf spots with corresponding sporulation on the leaf undersides.

In host range trials conducted at the Long Island Horticultural Research & Extension Center, heavy downy mildew sporulation was seen on *Impatiens hochstetteri* and sporulation was

also seen associated with small leaf spots on *I. flanaganiae*, *I. capensis*, *I. auricoma*, and *I. arguta*. Leaf samples have been sent to USDA-ARS for molecular analysis to see if the downy mildew affecting these other impatiens is genetically identical to the strains troubling *I. walleriana*.

New Guinea impatiens, *Impatiens hawkeri*, as well as hybrids such as SunPatiens® are not susceptible to impatiens downy mildew, nor are other garden plants. (Note that other plants can be susceptible to different downy mildew pathogens, but are not susceptible to the impatiens downy mildew caused by *P. obducens*.)

Conditions Affecting Infection and Spread

Downy mildew will thrive in moist or humid and cool conditions; the rate of disease development and spread will be greatest under conditions that create long periods of leaf wetness.

Downy mildew can be easily spread short distances via water splash from infected plants and greater distances via windborne spores. In landscapes, healthy plants can become infected via windblown spores from infected plants in neighboring landscapes, or from overwintering oospores (thick-walled survival spores) in the soil of garden beds where infected impatiens were grown in the past.



Leaf spot symptoms and sporulation on the undersides of leaves of Impatiens balsamina (garden balsam, balsam impatiens) (Photos courtesy of Margery Daughtrey)

Disease Management

Management must focus on prevention: once infected, plants will not recover. Thoroughly inspect any new plant material, and scout crops regularly and carefully. If any infected plants are identified, immediately remove and discard infected plants as well as any nearby symptomless plants. Once an outbreak has been identified, any remaining impatiens in the operation should be protected with fungicides.

Fungicides that have been shown to effectively manage downy mildew^{1,2} when applied prior to exposure to the pathogen include fungicides from:

- FRAC³ Group 4 (e.g., Subdue MAXX and Quali-Pro Mefenoxam; according to label, must be tank mixed with a product from a different FRAC Group),
- FRAC Group 43 (e.g., Adorn; according to label, must be tank mixed with a product from a different FRAC Group),
- FRAC Group 11 (e.g., Compass, Disarm, Fenstop, Heritage, Insignia, or Pageant),
- FRAC Group 40 (e.g., Micora, Stature, or Orvego (Group 40+45)),
- FRAC Group 21 (e.g.,

Segway),

- some fungicides in FRAC Group 33 (e.g., Vital), and
- FRAC Group M3 (e.g., Protect).

As a preventive program, applications should be made approximately every 2 weeks; if downy mildew has been found elsewhere on your property or at a supplier's property then reduce the spray interval to 1 week. Remember that fungicides will only be useful preventatively, not curatively, in the management of this disease during production.

Some protection in the landscape might be gained for a short time from treatment in the greenhouse prior to planting. Research conducted by Margery Daughtrey (Cornell University) and Aaron Palmateer (University of Florida) has shown that treatment with mefenoxam (FRAC Group 4), an experimental phosphorous acid material (FRAC Group 33), or a combination of the two materials prior to exposure to downy mildew delayed symptom development for 4-6 weeks. Be forewarned: plants exposed to downy mildew will only be protected for as long as the fungicide activity lasts. Also note that mefenoxam-resistant strains of downy mildew have already been identified in Europe—rotation is important.

To Plant or Not to Plant?

Whether or not to produce and sell impatiens is the big question for many. Depending upon how prevalent the disease was in their area in 2012, and their customer base, many greenhouse growers are reducing their production of impatiens. On the national level, decisions vary from no change to severely reducing, or even eliminating, impatiens production. Continue to listen to and work closely with your customers, so that you can provide plants that will perform well for them in gardens and landscapes in your area.

Additional Information

Various resources on impatiens downy mildew compiled by The American Floral Endowment: <http://www.endowment.org/afe-news/press-releases/221-controlling-downy-mildew-on-impatiens.html>

A list of alternative shade annuals, with basic information about garden size and production time: <http://ccesuffolk.org/assets/Floriculture/Alternatives-to-Garden-Impatiens.pdf>

Information on impatiens downy mildew for the home gardener: <http://ccesuffolk.org/assets/Floriculture/DM-HomeGarden-Sept2012.pdf>

¹ Based on research trials conducted by Margery Daughtrey (Cornell University), Colleen Warfield (Ball Horticultural Company), Mary Hausbeck (Michigan State University), and Aaron Palmateer (University of Florida).

² As always, make sure to follow all label recommendations and restrictions. Note that some of these materials are not registered for use in all states and some materials are restricted to greenhouse use only.

³ FRAC=Fungicide Resistance Action Committee; FRAC Groups are groups of fungicides with similar modes of action.