UNIVERSITY OF MINNESOTA EXTENSION

Horticulture

Managing Impatiens Downy Mildew in Greenhouses, Nurseries and Garden Centers

Plasmopara obducens

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IMPORTANCE

Impatiens downy mildew is an emerging disease problem that has resulted in severe defoliation and flower drop of impatiens. Impatiens downy mildew was first observed in Minnesota in 2011. Nursery & landscape impatiens are affected by the disease.

IDENTIFICATION

- Leaves first appear light yellow or stippled yellow & green.
- Occasionally gray to black lines or markings appear on the upper leaf surface.
- Fluffy white growth occurs on the lower surface of leaves.
- Leaf edges curl downward; leaves appear wilted.
- Plants infected young may be stunted with small leaves.
- Leaves and blossoms drop prematurely leaving bare stems.
- In very wet conditions, infected plant tissue becomes water soaked, soft and mushy.

Figure 1: Downy mildew sporulation on the lower leaf surface of an impatiens plant. Photo by M. Grabowski, UMN Extension

Report Suspected Cases to Arrest a Pest
1-888-545-6684 (Voicemail) or
Arrest.The.Pest@state.mn.us

BIOLOGY

All varieties of *Impatiens walleriana* and hybrids with *I. walleriana* in their background are susceptible to impatiens downy mildew. Touch-me–not (*I. balsamina*) and several wild species of impatiens can also be infected. New Guinea impatiens, *I. hawkerii* are highly resistant. Bedding plants of different genera are not susceptible to impatiens downy mildew.

Impatiens downy mildew is caused by *Plasmopara obducens*, an oomycete, often referred to as a water mold. There is no evidence that *P. obducens* can be transmitted by seed. The pathogen can be introduced into a nursery by windborne sporangia or on infected cuttings or plugs. Sporangia are produced on the lower surface of infected leaves and can be splashed short distances or may become airborne and travel long distances on moist air currents. Sporangia are short lived. In contrast, oospores are long term resting structures that form within infected tissue, often in the final stages of plant decline. Oospores allow the pathogen to survive from one season to the next.

Plasmopara obducens thrives in cool (63-73F) moist conditions. Four hours of leaf wetness is necessary for sporangia to form. Under hot dry conditions, infected plants may show no symptoms of disease and produce no sporangia on the lower leaf surface.

MANAGEMENT

Start with Clean Plant Material

Plasmopara obducens is not transmitted through seed; therefore seed raised plugs are initially disease free. If buying cuttings or plugs chose a supplier that has a regular preventative spray program for downy mildew. Under no circumstances should plants be carried over from the previous season. Plants sourced from an area where landscape plants are not present during production (i.e. colder northern states) will further minimize the risk of receiving infected plants.

Inspecting and Isolating New Plant Material

Carefully inspect all new impatiens for signs and symptoms of downy mildew. Early symptoms may be restricted to one or a few yellowing leaves with no or very limited sporulation on the lower surface of the leaf. Use a hand lens to look for downy sporulation on the lower surface of leaves. Send suspected plants to the University of Minnesota Plant Diagnostic clinic (http://pdc.umn.edu) for diagnosis.

Separate impatiens grown from cuttings from those grown from seed. Separate impatiens from different suppliers. This will reduce the risk of cross contamination. Teach workers how to identify the signs and symptoms of early infection of impatiens downy mildew.

Infected plant material should be immediately bagged, sealed and removed from the greenhouse to prevent spores from spreading through the greenhouse. Remove all fallen leaves and flowers in addition to infected plants. If sporulation is present, remove any plants within 3 feet of the infected plant. Airborne sporangia may have travelled farther, and infections from these sporangia may not be apparent for several days. Do not compost infected plant material. Any greenhouse sanitizer can be used to clean the bench.

Reduce Moisture and Humidity

Plasmopara obducens needs a minimum of 4 hours of leaf wetness to produce sporangia. Manage irrigation and air flow in the greenhouse to reduce humidity and leaf wetness as much as possible especially at night. Space plants to provide good air movement between plants. Manage greenhouse ventilation to reduce humidity and condensation.

Preventative Spray Programs

Treat plants with a preventative fungicide upon arrival unless you know they were treated by the supplier just prior to shipping. Request treatment records from your supplier to avoid over applying fungicides from the same chemical family.

Table 1: Fungicides registered for use against impatiens downy mildew in MN greenhouses

FRAC	Active ingredient	Trade Names*
M3	mancozeb	Protect DF, Dithane
4	mefenoxam	Subdue MAXX
11	azoxystrobin	Heritage
11	fluoxastrobin	Disarm O
11 + 7	pyraclostrobin + boscalid	Pageant
21	cyazofamid	Segway
33	Phosphorous acid	Alude, Agri-Fos, Vital
40	dimethomorph	Stature
40	mandipropamid	Micora
43	fluopicolide	Adorn

*Trade names indicate products registered for use in MN in 2012 but do not imply endorsement by UMN Extension. Products with the same active ingredient but a different trade name should also protect plants from impatiens downy mildew.

Fungicides MUST be applied prior to infection. Poor to no disease control will occur if fungicides are applied to infected plants. Applying Subdue MAXX and Adorn as soil drenches has been shown to provide considerably longer residual activity compared to foliar applications of other products.

Apply foliar treatments every 7 days. Mefenoxam resistant isolates have been document in Europe. Rotate between different chemical families of fungicides (each family has a different FRAC Code) or tank mix two fungicides from different chemical families to help prevent fungicide resistance developing in the USA. All label instructions must be carefully read and followed when applying a fungicide.