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

**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

**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.

While there have been sporadic reports of impatiens downy mildew in U.S. greenhouses since 2004, it was not until summer 2011 that regional outbreaks of this disease were seen for the first time in landscape beds and container plantings in North America. In early January 2012, outbreaks of impatiens downy mildew were observed in landscape beds and greenhouses in south Florida. It is unclear whether this was a continuation of the 2011 outbreaks or a new cycle of disease for 2012. By the end of the 2012 season, impatiens downy mildew had been confirmed in 33 states. However, the occurrence and timing of when the disease showed up within a geographic region was highly variable. In early November 2012, new outbreaks were being seen in south Florida landscapes signalling the potential start of a new cycle of disease for the 2013 season.

Young plant and finish growers are at an increased risk for this disease if:
1. Located in region where production of *I. walleriana* comincides with plantings of *I. walleriana* growing in the landscape.
2. Source of incoming liners and plugs from region where infected impatiens are currently growing or have been reported in landscape
3. Growing in region where infected impatiens were confirmed in the landscape in 2011 or 2012.

**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 zoosporites) 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.

**Two main 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 travel on the order of hundreds of miles).

**CAUTION**: Infected plants not yet showing symptoms may result in the inadvertent movement of the pathogen.

**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
- Subtle gray markings on upper leaf surface sometimes visible
- 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)
Example of an Impatiens Downy Mildew Fungicide Rotation

<table>
<thead>
<tr>
<th>Appl No.</th>
<th>FRAC Code</th>
<th>Fungicide</th>
<th>Method</th>
<th>Rate /100 gal</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Cuttings</td>
<td>43+M3</td>
<td>Adorn + Protect DF + Capsil</td>
<td>Spray</td>
<td>2 fl oz + 2 lb + 6 fl oz</td>
</tr>
<tr>
<td>Plugs (or as soon as rooted)</td>
<td>43+4</td>
<td>Adorn or Adorn + Subdue MAXX (or Subdue MAXX alone if Adorn applied to cuttings)</td>
<td>Drench</td>
<td>1 fl oz + 1 fl oz</td>
</tr>
<tr>
<td>2</td>
<td>40</td>
<td>Stature SC</td>
<td>Spray</td>
<td>12.25 fl oz</td>
</tr>
<tr>
<td>3 M3</td>
<td>Protect DF + Capsil</td>
<td>Spray</td>
<td>2 lb + 6 fl oz</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>4+43</td>
<td>Subdue MAXX + Adorn</td>
<td>Drench</td>
<td>1 fl oz + 1 fl oz</td>
</tr>
<tr>
<td>11 or FenStop (not in NY)</td>
<td>11+7</td>
<td>Pageant</td>
<td>Spray</td>
<td>9 fl oz</td>
</tr>
</tbody>
</table>

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
- If sporulation is visible, remove adjacent plants within 3 feet

Chemical Control
- Preventive application is critical. Control is nearly impossible once sporulation has occurred in a growing facility.
- Make first fungicide application at transplant (plugs)
- Make first fungicide application within 7 days of receipt (unrooted cuttings)
- Under low disease pressure or low risk: Reapply foliar applications at 7 day intervals with different FRAC code product
- Under high disease pressure or high risk: 7-day intervals with foliar applications may not be sufficient due to limited residual activity
- Apply a final drench application within 1 week prior to ship

Drenches of Adorn and/or Subdue MAXX exhibited the longest residual efficacy (21-28 days) of all fungicides tested in a limited number of research trials. Tank mix to reduce the risk of fungicide resistance.

Addition Information

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