



Downey Mildew, Symptoms, Treatment and Prevention

Grimes Hort offers these tips by Syngenta Technical Services Team

The horticulture world has been abuzz with discussions of a 'new' disease of impatiens – Impatiens Downy Mildew. The disease is not actually new, having been in the US since at least 1897 when it was reported on wild species of impatiens. The disease has been more prevalent in the last ten years and was significant in some landscape plantings in the US during late summer 2011. However, prudent measures will allow this beautiful plant to continue to be a valuable part of our crop mix.

The causal agent of impatiens downy mildew affecting crops is *Plasmopara obducens*, a "water mold" or oomycete. It only infects some species within the genus *impatiens* and cannot threaten other flower crops. *Impatiens walleriana* (common garden impatiens) are affected by impatiens downy mildew but New Guinea impatiens (*I. hawkeri*) are highly tolerant of this disease.

Symptoms

Impatiens infected with downy mildew can simply appear non-vigorous with yellowish or pale green foliage and mild, inconspicuous mottling. These subtle symptoms can be missed or mistaken for other problems. As the disease progresses advanced symptoms may include stunting of plant growth, downward curling or distortion of the leaves, loss of leaves, wilting and plant collapse.

The most distinct sign of downy mildew of impatiens is white to light gray downy 'fuzz' on the undersides of the leaves, but because the fungal growth is only visible on the undersides of the leaves it can be missed. Frequent scouting is essential. To confirm a potential diagnosis of impatiens downy mildew, submit samples to the Syngenta diagnostic lab. You can contact flowers.tech.help@syngenta.com for more information.

Prevention – Cultural Practices

Prevention of impatiens downy mildew is essential because control of an infection is extremely difficult. Start with propagation material free of the disease. Since the disease is not transmitted by seed, seedling plugs of *I. walleriana* that have been isolated from any source of the disease will be disease-free. Vegetatively-propagated *I. walleriana* from reputable suppliers should be disease-free. However, since the disease may be initially symptomless, it is prudent to isolate vegetatively-propagated *I. walleriana* from seed-propagated impatiens.

Maintain moderate humidity, provide air movement, irrigate early in the day and avoid foliage moisture for extended times.

Any impatiens plants left after the main crop has been shipped should be removed from the greenhouse immediately and discarded. No volunteer plants should be allowed to grow in or around the production area, even briefly.

Prevention – Plant Protection Products

A downy mildew prevention program should include a rotation of effective fungicides (see Table 1) with different modes of action. Table 1. Examples of products suitable for use in a greenhouse control program for impatiens downy mildew.

Product	Active Ingredient	Activity	Application	REI	Company
Subdue Maxx®	Mefenoxam	Systemic	Spray Drench	48 hr REI exemptions (0 hr) for certain drench applications	Syngenta
Heritage®*	Azoxystrobin	Systemic	Spray	4 hr	Syngenta
Disarm® O	Fluoxastrobin	Systemic	Spray	12 hr	OHP
Fenstop™	Fenamidone	Systemic	Spray	12 hr	OHP
Pageant™	Pyraclostrobin + Boscalid	Translaminar (11) + Systemic (7)	Spray	12 hr	BASF
Segway™	Cyazofamid	Translaminar	Spray	12 hr	FMC
Aliette®	Fosetyl-AL	Systemic	Spray	12 hr	OHP/Bayer
Alude™	Potassium salts of Phosphorous Acid	Systemic	Spray	4 hr	Cleary Chemical Corp.
Vital®	Potassium phosphite	Systemic	Spray	4 hr	Phoenix
Stature® SC	Dimethomorph	Translaminar	Spray	12 hr	BASF
Adorn®	Fluopicolide	Systemic	Spray Drench	12 hr	Valent
Protect™ DF	Mancozeb	Contact	Spray	24 hr	Cleary Chemical Corp.

NOTES:

- Always test products on a small area before using on an entire crop.
- For brevity some products with the same mode of action have been omitted.

*Syngenta supports a FIFRA Section 2(ee) recommendation for Heritage to control Impatiens Downy Mildew on bedding plants in AL, AR, AZ, CA, CO, CT, DE, FL, GA, HI, IA, ID, IL, IN, KS, KY, LA, MA, ME, MI, MN, MO, MD, MS, MT, NE, NC, ND, NH, NM, NJ, NV, OK, OH, PA, RI, SC, SD, TN, UT, VA, VT, WA, WI, WV and WY.

Young plant production:

Preventative measures in propagation are good safeguards. Since propagation time is short one or two applications should be sufficient (Table 2)

Table 2. An example of a program for prevention of impatiens downy mildew as well as other diseases of impatiens during propagation.

Propagation Week	Plugs <i>(Seed or URC)</i>
1	
2	Drench – 21 or 4
3	
4	Spray – M or 11

Finished plant production:

Finished plant production may be as long as 12 weeks from transplant to shipping giving a longer time for spread of any impatiens downy mildew which might occur. The example rotation shown in table 3 gives options for multiple applications of protective fungicides for downy mildew as well as other common diseases of impatiens.

Growers have the opportunity to apply products to provide some early-season protection against the disease in the landscape. We specifically recommend a drench application to finished plants shortly before shipping. While no product will give season-long control of impatiens downy mildew, drench applications prior to shipping have been shown to provide early season protection against the disease and increase the duration of acceptable performance in the landscape.

Table 3. An example of a program for prevention of impatiens downy mildew as well as other diseases of impatiens during production of finished plants.

	Week	Application	Fungicide FRAC #	Target Diseases
	Post-Transplant			
4 inch pot or smaller	1	Recommended Drench	4 + 43	Pythium, Phytophthora, Downy Mildew
	2	Optional Treatment	M	Leafspots – Alternaria, Botrytis
	3	Recommended Treatment	11	Downy Mildew Leafspots
	4	Optional Treatment	21 or 43 + M	Downy Mildew
	5	Recommended Treatment	33	Downy Mildew, Pythium, Phytophthora (<i>drench</i>)
	6	Optional Treatment	11	Downy Mildew Leafspots
6 inch pot	7	Recommended Treatment	40	Downy Mildew
	8	Optional Treatment	11	Downy Mildew Leafspots
	9	Recommended Treatment(<i>drench</i>)	4 + 33	Downy Mildew, Pythium, Phytophthora (<i>drench</i>)
	9	Recommended Treatment	40	Downy Mildew
Larger containers	10	Optional Treatment	40	Downy Mildew
	11	Recommended Treatment(<i>drench</i>)	4 + 33	Downy Mildew, Pythium, Phytophthora (<i>drench</i>)

What to do if you find downy mildew

Should impatiens downy mildew be confirmed in the greenhouse all plants with symptoms and any fallen leaves must be immediately placed in sealed bags and removed from the greenhouse. Also remove and discard plants from a buffer area of three feet (one meter) radius or more around infected plants. Use an approved greenhouse disinfectant to disinfect greenhouse surfaces contacted by infected plants. Begin a preventive fungicide program (Table 3) on all remaining *I. walleriana*.

Alternatives to impatiens

While no plant is an exact replacement for impatiens, there are options if it is necessary to substitute for impatiens:

Begonia – Hot Tips, Chocolates, Dragon Wing, Big, Bada Bing®, Bada Boom®, Eureka™, Varsity™, Volumia™, Braveheart®
Coleus – Jazz, HiGro, Versa, Wizard
Euphorbia – Euphoric™ (avoid deep shade)
Geranium – Saturn, Caliente®
Lobelia – Coat of Arms, Palace, Riviera, Techno®
New Guinea Impatiens – Harmony, Sonic® and Super Sonic®
Nicotiana – Avalon, Perfume, Saratoga™
Plectranthus – Emerald Lace
Petunia – Candypops, Trailing, Wave, Freedom, Best Yet, Sanguna, Storm, Ultra, Ramblin (avoid deep shade)
Salvia – Firecracker, LoGro, Picante™, Salsa™
Torenia – Kauai, Duchess™