



Great Lakes Fruit, Vegetable & Farm Market EXPO

Michigan Greenhouse Growers EXPO

December 9 - 11, 2014

DeVos Place Convention Center, Grand Rapids, MI



Greenhouse: Controlling Downy Mildew on Impatiens

Tuesday afternoon 2:00 pm

Where: River Overlook (upper level) Room C & D

Recent MSU research shows that greenhouse treatments can help to protect impatiens plants in the landscape. Learn the latest recommendations to keep your customers coming back for more impatiens.

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MI Recertification credits: 1 (COMM CORE, PRIV CORE)

OH Recertification credits: 0.5 (presentations as marked)

Moderator: Thomas Dudek, Senior Greenhouse Educator, MSU Extension, West Olive, MI

2:00 pm Controlling Downy Mildew on Impatiens (OH: 6D, 0.5 hr)

- Mary Hausbeck, Plant, Soil and Microbial Sciences Dept., MSU

2:50 pm Session Ends

Controlling Downy Mildew on Impatiens

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Michigan State University, Department of Plant, Soil & Microbial Sciences

Downy mildew on impatiens is a relatively new disease problem for greenhouse growers in the U.S. The downy mildew pathogen is *Plasmopara obducens* and infects bedding impatiens, double impatiens, and balsam (Fig. 1). New Guinea impatiens, other flowering bedding plants, and vegetables are not susceptible. Bedding impatiens are a favorite plant for use in shady areas where they are planted in mass for bright color in the landscape. Double impatiens are used in hanging pots, planters, and decorative pouches.



Fig 1. *A*, diseased impatiens leaf (left) versus healthy leaf (right). *B*, underside of an impatiens leaf covered with downy mildew sporangia. *C*, oval sporangia produced on stalks that extend from the underside of the leaf.

Outbreaks of downy mildew on impatiens in greenhouses can quickly escalate into epidemics if not controlled. The disease can become widespread within the greenhouse and losses can approach 100%. It is imperative that only healthy impatiens be introduced into consumers' landscapes. A type of downy mildew spore that is especially long lasting may form in the stems and leaves of infected impatiens and is called an oospore. These long-lasting oospores are not readily visible without the aid of a microscope and have been found in Michigan samples of infected impatiens gathered from the landscape in previous years (Fig. 2). If the impatiens plants with these long-lasting oospores are not promptly removed from the greenhouse or garden and disposed of, the soil may become contaminated with the downy mildew pathogen. Once the garden soil is contaminated with these long-lasting downy mildew oospores, it may become difficult to successfully grow impatiens in the same location in another year.

Diseased impatiens may appear to be a bit off color (Fig. 1A) with a white mildew coating the underside of the leaves (Fig. 1B). However, green leaves may also have pathogen sporulation evident on the undersides of the leaves. As the infection continues, the leaves turn yellow and may fall off the plant leaving only the stems behind (Fig. 2). The white mildew coating on the undersides of the leaves (Fig. 1B) is a layer of a type of spore known as a sporangium (Fig. 1C) that moves around the environment via air currents. When sporangia settle out of the air onto impatiens leaves, a new infection results if there is

a period of leaf wetness. Summer weather that is rainy with cooler temperatures is conducive to impatiens downy mildew developing in the landscape.



Fig. 2. *A, downy mildew infected impatiens showing leaf abscission. B, landscape planting of impatiens following an epidemic of downy mildew.*

Once the plant is infected, there is no fungicide that can “cure” the plant. Many other crops also have their own specialized downy mildew and we’ve learned that as a group, the downy mildews are quite adept at overcoming fungicides. Therefore, a fungicide program must utilize multiple products that have proven activity and offer differing modes of action against this pathogen. Using fungicides preventively, prior to the infection and development of downy mildew, is also important in delaying resistance in the downy mildew pathogen. Initiating a fungicide program in the midst of a raging downy mildew epidemic is not recommended as fungicides cannot “cure” the disease. Alternating fungicides and tank mixing two fungicides that offer different means of halting the pathogen can also be important strategies in managing the disease and helping to prevent the development of fungicide resistance in the pathogen.

Greenhouse growers and professional landscapers have downy mildew fungicides available to them. It has been our

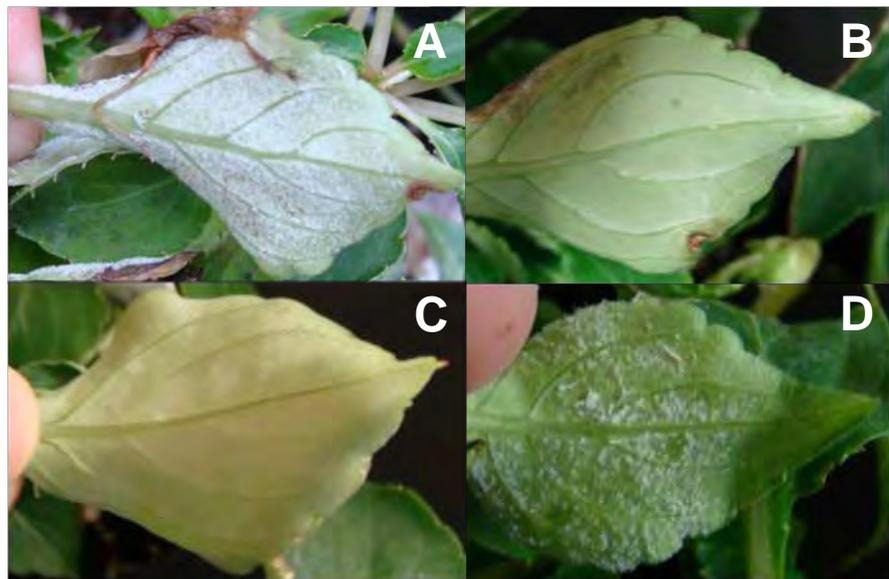


Fig. 3. *Greenhouse trial results. A, untreated control. B, Adorn SC 2 fl oz drench. C, Subdue MAXX EC 1 fl oz drench. D, Heritage WG 4 oz + Capsil 4 fl oz spray. Note sporulation in A and D.*

experience through fungicide trials that the most effective fungicides must be used in an intensive application program to protect impatiens from this pathogen when the environmental conditions are favorable for disease development. Many of the recommended downy mildew fungicides are newer products and growers may not be readily familiar with them. Adorn (fluopicolide, Fig. 3B), Segway (cyazofamid), Micora (mandipropamid), Orvego (dimethomorph + ametoctradin), and FenStop (fenamidone) are examples of some of the newer fungicides that are labeled for downy mildew control. MSU research conducted to date indicates that some fungicides are better when applied as a drench compared to application as a foliar spray (*NOTE: Many fungicides may not be labeled for use as a drench for downy mildew control. Please read the label carefully and contact the registrant with questions*). A broad-spectrum fungicide such as Protect DF or Dithane (both are mancozeb products) can be used alone or as a tank mix partner with other more specific downy mildew fungicides. Subdue MAXX (mefenoxam, Fig. 3C) and Adorn (Fig. 3B) drenches provide systemic downy mildew protection. Heritage (azoxystrobin, Fig. 3D) and Insignia (pyraclostrobin) sprays can be helpful against both downy mildew and Alternaria leaf blight. Phosphorus acid-based products may also prove to be helpful when applied as a drench. **NOTE: Recent reports from growers indicate that there may be phytotoxicity issues with Alude, a phosphorous acid product; therefore, until further research can be conducted, we are not currently recommending Alude for use on impatiens.** In general, adjuvants do not enhance downy mildew control but may help reduce the appearance of fungicide residue and allow the leaf to dry faster.

Greenhouse to Landscape Fungicide Research Trial. A trial was initiated in the greenhouse and impatiens were transplanted into the landscape at two sites in 2014. Treatments were applied to the plants while in the greenhouse from 9 May through 2 June at 7-day intervals (5 applications), 14-day intervals (3 applications) and 28-day intervals (2 applications). Impatiens were transplanted into the landscape on 4 June (Site 1) and 9 June (Site 2) into beds that had diseased impatiens the previous year. Once the plants were placed into the landscape, no further fungicides were applied. Disease was evaluated at 14-day intervals throughout the season (last rating date of 24 September shown in Fig. 4).

Downy mildew was first observed on the 2 July rating date at Site 1 and on 13 August at Site 2. All untreated control plants became diseased by 28 July (Site1) and 26 Aug (Site 2) (data not shown). All treatments, with the exception of Exp 1 drenches at 14-day intervals, prevented downy mildew at Site 1. Diseased plants (%) was higher at Site 2 than Site 1. The only treatment that prevented downy mildew

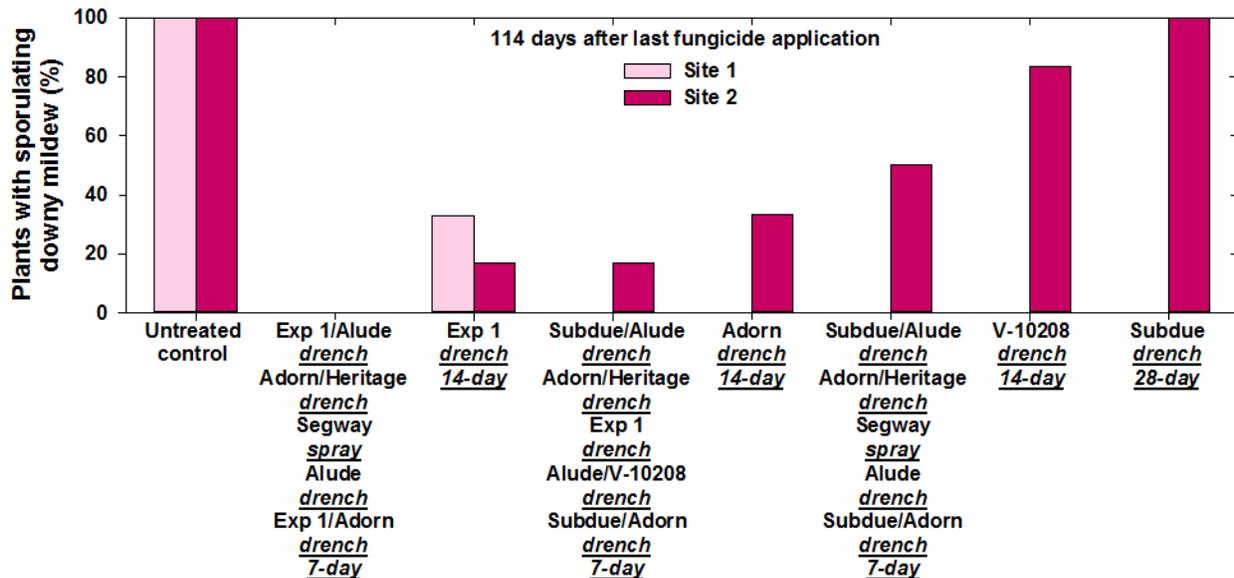


Fig. 4. Evaluation of fungicide drenches and sprays applied in the greenhouse for control of downy mildew of impatiens in the landscape.

at Site 2 was the program that included Exp 1 in treatment applications 1 and 5. The downy mildew pathogen at Site 2 was resistant to Subdue MAXX (mefenoxam), and all mefenoxam-treated plants at this site were diseased on the last rating date.

In summary, the 2014 research results show that treated impatiens can be successfully grown in the landscape even when the planting bed has a history of impatiens infected with downy mildew. The impatiens plants must be treated while still in the greenhouse with recommended fungicides in order remain protected once they are placed into the landscape.

NOTE: Recent reports from growers indicate that there may be phytotoxicity issues with Alude; therefore, until further research can be conducted, we are not currently recommending Alude for use on impatiens.

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