

In This Issue

Basil downy mildew

Calendar of Events

July 24 – UW-Hancock Ag Research Station, Field Day, 12:30-4:00PM

August 2 – UW-Langlade County Ag Res Station Field Day Antigo, 1:00PM

Vegetable Disease Update – Amanda J. Gevens, Vegetable Plant Pathologist, UW-Madison, Dept. of Plant Pathology, 608-890-3072 (office), Email: gevens@wisc.edu.

Vegetable Pathology Webpage: <http://www.plantpath.wisc.edu/wivegdis/>

Basil downy mildew: Today, while visiting a home improvement center in the Madison area, I found basil plants with symptoms and signs of downy mildew (pictures below from 2011 case). Upon examination under the microscope, pathogen structures were consistent with *Peronospora belbahrii*, the fungus-like causal agent of basil downy mildew (picture below from 2011 case). This is the first report of this disease on basil in Wisconsin for 2012. All of the small ~6-inch potted plants I inspected were approximately 50% infected and were from a Midwestern source. Lower leaves were yellow, with some dark brown irregular spotting, and were cupped or gnarled downward. The undersides of leaves were covered with dark brown-gray pathogen sporulation. I do not recommend the purchase of plants of this status, as the likelihood that they may be successful in the garden is very low.

Last year, just a single report of basil downy mildew was identified on a few plants in a community garden in Madison. There was no further spread from the infected plants to basil in the rest of the garden, or beyond. With the pathogen present so early in 2012, the risk that we may see further reports of this disease is great. Particularly, since the pathogen tolerates cool wet conditions that we are experiencing in the state at this time. Additionally, the distribution of infected plants may provide many sources of inoculum for field-grown basil in 2012.

Basil downy mildew has made recent headlines nationally as a new disease in North America as well as Europe. First reported in FL in 2007, basil downy mildew was later found in field and greenhouse in Canada, Argentina, and in over a dozen US states as of 2011. The case was confirmed in Wisconsin in 2010.

The basil downy mildew pathogen can be transmitted on seed, infected plant parts, and the wind. This particular downy mildew can infect both ornamental and basil varieties grown as herbs. It is suspected that basil downy mildew has moved geographically on contaminated seed or leaves. The spores of basil downy mildew are produced on leaf underside prolifically and can be aerially dispersed long distances.

The management of basil downy mildew includes planting uninfested or ‘clean’ basil seed, selecting resistant or tolerant varieties, and applying fungicides when environmental conditions favor disease. Minimizing leaf wetness and humidity will aid in downy mildew management as the pathogen is favored by moist conditions. It is known that sweet basil varieties are more susceptible than other basil species. The table below indicated relative susceptibility of typical varieties (from Dr. Meg McGrath, Cornell).

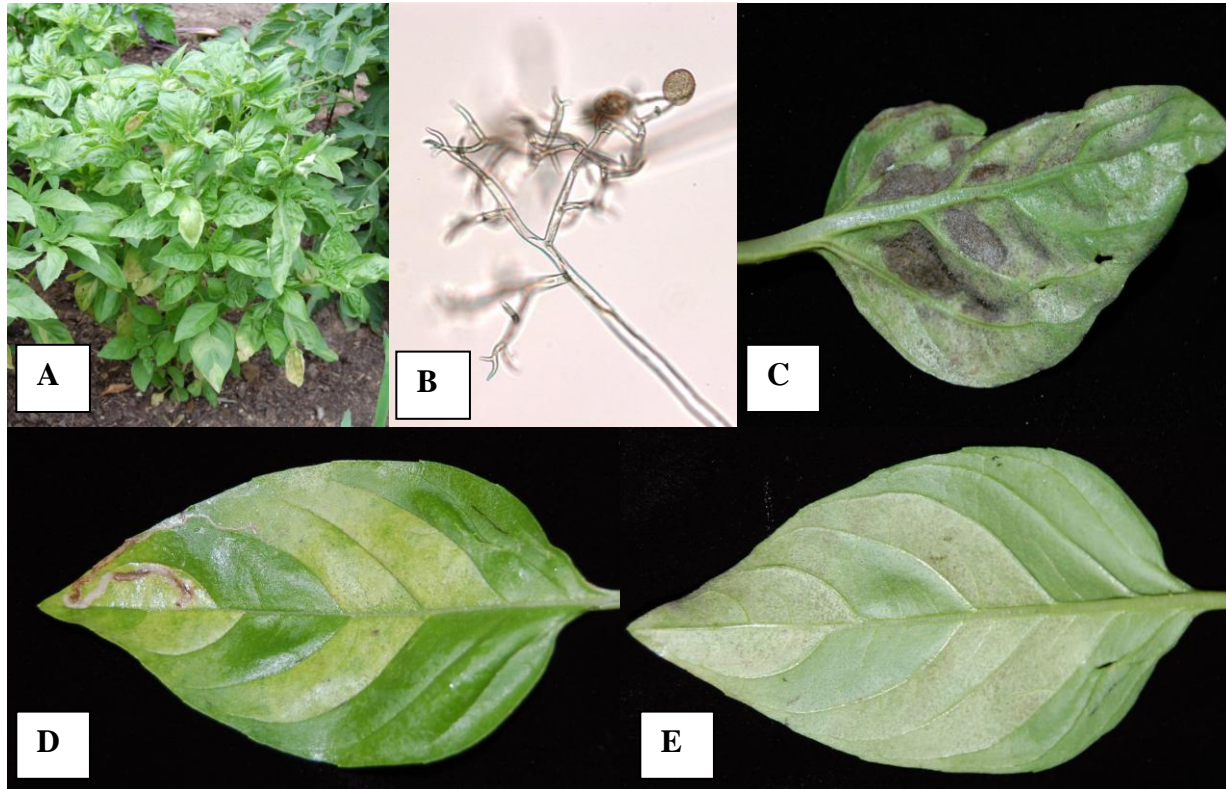
Basil varieties susceptible to downy mildew	
Aroma 2	Italian Large Leaf
Genovese	Magical Micheal
Genoveser Martina	Mariden
Nufar	Opal Purple Variegated
Queenette	Poppy Joe’s
Superbo	
Basil varieties tolerant to downy mildew	
Amethyst Imp	Mrs. Burns Lemon
Red Rubin	Red Leaf
Sweet Adin	Lemon
Lemon standard	Lemon Mrs. Burns
Lemona	Lime
Basil varieties resistant to downy mildew	
Spice	Blue Spice
Blue Spice Fil	

While not a preferred approach for home gardeners that may have just one or a few basil plants, fungicides can limit basil downy mildew. Applying fungicides frequently and starting before first symptoms are considered necessary to control downy mildew effectively. Few fungicides are currently labeled for this new disease. Actinovate AG and OxiDate are OMRI-listed fungicide labeled for use on herbs and for suppressing foliar diseases including downy mildew. OxiDate is labeled for use outdoors and in greenhouses. The Actinovate label does not have a statement prohibiting use in greenhouses. There are two phosphorous acid fungicides, ProPhyt and K-Phite, that have downy mildew under herbs on the current label. These fungicides were effective in fungicide efficacy experiments with applications started before or after initial symptoms were found. Greenhouse use is not prohibited. Quadris is labeled for use on basil but not specifically for downy mildew; but has been shown to be effective for this downy mildew. Greenhouse use is not permitted with Quadris. Other fungicides are expected to be labeled for basil downy mildew in the future.

To determine when to initiate a fungicide program and also when it is warranted to consider harvesting early to avoid losses to downy mildew, growers should regularly inspect their plants for symptoms. The cucurbit downy mildew forecasting web site (<http://cdm.ipmpipe.org>) might be useful for predicting when conditions are favorable for basil downy mildew since both pathogens have similar requirements for wind dispersal long distances (e.g. overcast skies) and subsequent infection (e.g. wet leaves). Summer is not a time to forget about this disease: unlike most other downy mildew pathogens, e.g. the ones affecting lettuce and cruciferous crops, which

stop developing in summer, the basil downy mildew pathogen seems to develop best under moderate to warm temperatures while also tolerating cool temperatures.

Basil crops should be disked under or otherwise destroyed as soon as possible after last harvest, or when abandoned because of disease, to eliminate this source of inoculum. Further details on registered fungicides for WI vegetables can be found in the Univ. of WI Commercial Vegetable Production in WI Guide A3422, <http://learningstore.uwex.edu/assets/pdfs/A3422.PDF>.



Basil downy mildew symptoms and signs. **A.** Basil plant exhibiting symptoms of leaf yellowing consistent with downy mildew (2011). **B.** Branched sporangiophores (spore tree) and sporangia (spore) of basil downy mildew under 200X magnification. **C.** Underside of leaf exhibiting signs (dark gray, 'dirty' spores) and symptoms (brown, dead sections of leaf) of basil downy mildew. **D.** Topside of leaf (note yellowing or chlorosis) with angular (vein confined) lesions. **E.** Underside of leaf (note patches of gray-purple fuzzy pathogen sporulation) with angular pattern.