Vegetable Crop Update

A newsletter for commercial potato and vegetable growers prepared by the University of Wisconsin-Madison vegetable research and extension specialists

No. 9 – June 15, 2014

In This Issue

Herbicide update – Upbeet for garden beet
Late blight updates
Blitecast and P-Days for late blight and early blight management
Basil downy mildew

Calendar of Events

June 19 – Organic & Sustainable Diversified Veg Farm Field Day, Sunbow Farm, Eau Claire, WI (UWEX St. Croix County)
June 26 – WI IPM Field Day, Arlington Ag Research Station, Arlington, WI
July 15 – Crops Diagnostic Workshop, Arlington Ag Research Station, Arlington, WI
July 18 – UW Potato Breeding Station Tour, Rhinelander Ag Research Station
July 22– UW-Hancock Agricultural Research Station Field Day, Hancock, WI
August 12-14 – Farm Technology Days, Stevens Point, WI
August 21 – 1:00PM Antigo Field Day, Antigo, WI

Weed Management Update – Jed Colquhoun, Professor & Extension Weed Scientist, UW-Madison, Dept. of Horticulture, 608-890-0980 (office), Email: colquhoun@wisc.edu

Upbeet herbicide supplemental label approved for garden beets: Weed control in garden (table) beets has always been challenging given the slow growth and uncompetitive nature of the crop. This challenge has become more significant in recent years with the loss of some of the herbicides previously registered for use in garden beets, particularly as a result of the introduction of glyphosate-resistant sugar beets and loss of market share for these specialized products.

DuPont's Upbeet herbicide previously had a supplemental label for use in garden beets that expired on May 14, 2014. They have now issued a new supplemental label that expires on December 31, 2014. The new supplemental label can be accessed directly from the DuPont website: http://www2.dupont.com/Production_Agriculture/en_US/label_msds_info/label.html.

Upbeet herbicide provides postemergent broadleaf weed control of species such as shepherdspurse, wild mustard and most importantly in much of our production area, velvetleaf. Upbeet can be a useful component in an integrated weed management program in garden beets that utilizes multiple tools to achieve adequate weed control. Please see the label materials for more detail on use instructions and precautions.

Vegetable Disease Update – Amanda J. Gevens, Assistant Professor & Extension Vegetable Plant Pathologist, UW-Madison, Dept. of Plant Pathology, 608-890-3072 (office), Email: gevens@wisc.edu. Veg Pathology Webpage: http://www.plantpath.wisc.edu/wivegdis/

Late blight updates: No reports of late blight in Wisconsin at this time. Nationally, in the past week, there were no new late blight diagnoses reported at http://www.usablight.org/. So far in 2014, several FL counties have reported late blight caused by genotype US-23 in tomato and potato. The website provides location (by county) of positive reports of late blight in the U.S. and provides further information on disease characteristics and management.

Current P-Day (Early Blight) and Severity Value (Late Blight) Accumulations
A P-Day value of ≥ 300 indicates the threshold for early blight risk and triggers preventative application of fungicide. A DSV of ≥ 18 indicates the threshold for late blight risk and triggers preventative application of fungicide. Red text in table below indicates threshold has been met. NA indicates that information is not yet available as emergence has yet to occur. Blitecast and P-Day values for actual potato field weather from Grand Marsh, Hancock, Plover, and Antigo are now posted at the UW Veg Path website at the tab "P-Days and Severity Values."
http://www.plantpath.wisc.edu/wivegdis/contents_pages/pday_sevval_2014.html

Location	Planting Date	50% Emergence	P-Day Cumulative	Disease Severity Value	Date of DSV Generation
Antigo	Early 5/20	6/9	34	0	6/13
	Mid 5/27	NA	NA	NA	NA
	Late 6/6	NA	NA	NA	NA
Grand Marsh	Early 4/20	5/19	189	**25***	6/13
	Mid 5/4	6/1	101	**20***	6/13
	Late 6/3	NA	NA	NA	NA
Hancock	Early 4/24	5/20	202	8	6/13
	Mid 5/8	6/2	104	4	6/13
	Late 6/3	NA	NA	NA	NA
Plover	Early 4/21	5/20	185	12	6/13
	Mid 5/5	6/1	101	9	6/13
	Late 6/5	NA	NA	NA	NA

Please note that we have surpassed the threshold for DSVs (18) in the Grand Marsh area for early and mid-planted potatoes. This indicates that temperature and humidity have been favorable for the promotion of late blight. Please note: asterisks on the DSVs for Grand Marsh indicate that I have revised the value as displayed in the SureHarvest Blitecast daily output that is found at the UW-Vegetable Pathology website for 5 June 2014. The number of hours of relative humidity above 90% was being issued as 63 – giving unusually high DSVs for the individual day. I assigned a DSV of 4 to 5 June which is the maximum that should be possible with our DSV generating tool. Early preventive fungicide application for late blight control may include base protectants such as chlorothalonil or mancozeb, or include a base protectant tank-mixed with one of the reduced risk fungicides with specific activity in controlling late blight. For further information on specific fungicide rates and activities, please find the 2014 updated list of potato fungicides for WI at the link below. Or, the page can be found in a pdf format under the "Late Blight" tab of the UW-Vegetable Pathology website.
http://www.plantpath.wisc.edu/wivegdis/pdf/2014/June%206%202014.pdf

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.

P-Days and early blight management: P-Days for early planted potatoes in Central Wisconsin are reaching roughly 200. I would expect that by next week we will have some sites at or just below 300 threshold – an indicator for timing the initial fungicide application for management of early blight. No early blight lesions have been noted in our potato pathology trials at this time.

Basil downy mildew detected in Wisconsin: Dr. Brian Hudelson, director and diagnostician in the UWEX Plant Disease Diagnostic Clinic in Madison has confirmed the diagnosis of downy mildew on at least 2 basil samples in this clinic this past week. In both cases, the plants were in greenhouse environments and had been recently introduced into the greenhouse settings from other production sites. Weather conditions are often very favorable for 'water mold' pathogens in greenhouse settings (high humidity, warm temperatures, limited airflow) and we know basil downy mildew to be seedborne. *Peronospora belbahrii*, the fungus-like causal agent of basil downy mildew (picture below from 2011 case), causes yellowing of leaves, often some dark brown irregular spotting, and cupping/gnarling of leaves often downward. The undersides of leaves may be covered with dark brown-gray pathogen sporulation. If you are purchasing transplants, be watchful for these symptoms.

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 disease was first confirmed in Wisconsin in 2010 and in each subsequent year since. 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 are produced on leaf underside prolifically and can be aerially dispersed long distances.

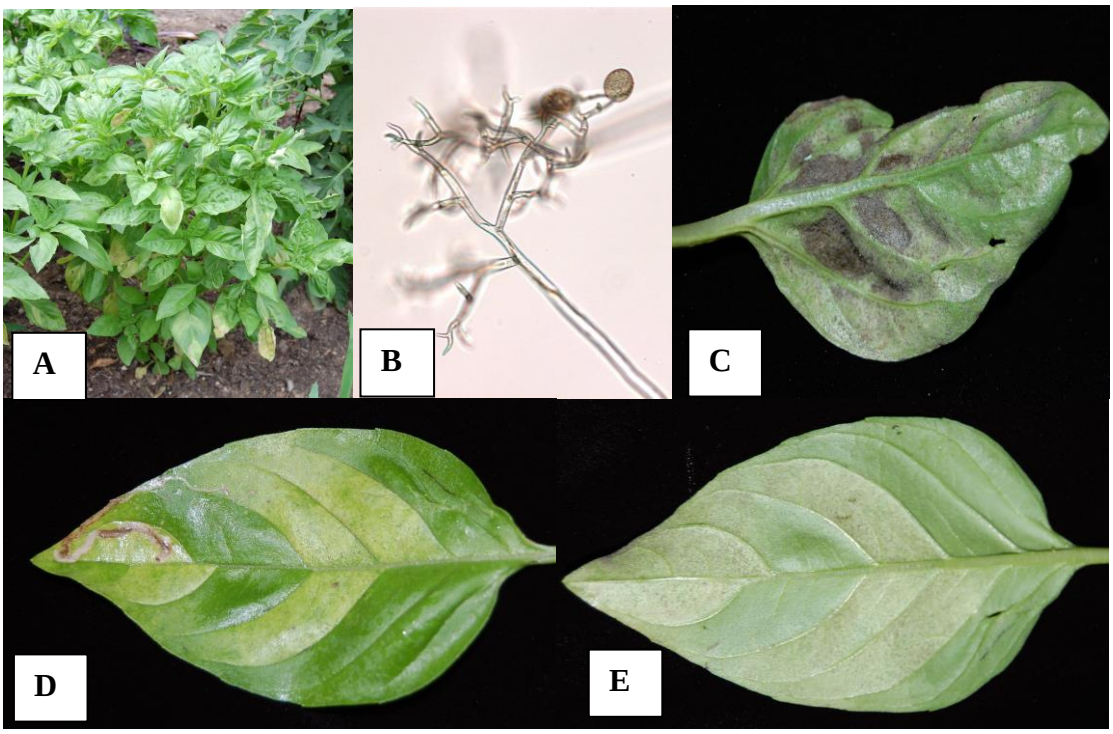
The management of basil downy mildew includes planting uninfested or 'clean' basil seed, selecting resistant or tolerant varieties, planting transplants at greater distances apart, and applying fungicides when environmental conditions favor disease. Minimizing leaf wetness and humidity aid in management as the pathogen is favored by moist conditions. Increasing plant spacing and encouraging air flow between rows can greatly limit disease development. It is known that sweet basil varieties are more susceptible than other types. 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	Superbo
Genovese	Magical Micheal	Queenette
Genoveser Martina	Mariden	Poppy Joe's
Nufar	Opal Purple Variegated	
Basil varieties tolerant to downy mildew		
Amethyst Imp	Mrs. Burns Lemon	Lemona
Red Rubin	Red Leaf	Lime
Sweet Adin	Lemon	
Lemon standard	Lemon Mrs. Burns	
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. Ranman is now labelled for basil downy mildew in open field and the greenhouse. 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.