



# Vegetable Crop Update

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

No. 11 – June 27, 2014

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Blitecast and P-Days for late blight and early blight management  
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## Calendar of Events

**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 5** – Crops Diagnostic Workshop, Arlington Ag Research Station, Arlington, WI  
**August 12-14** – Farm Technology Days, Stevens Point, WI  
**August 21** – 1:00PM Antigo Field Day, Antigo, WI

**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](mailto:gevens@wisc.edu). Veg Pathology Webpage: <http://www.plantpath.wisc.edu/wivegdis/>**



**Late blight updates:** No late blight has been detected in Wisconsin at this time. Nationally, in the past week, there have been several new late blight reports in NY and PA (indicated on map to the left in red, from [usablight.org](http://www.usablight.org)). The Erie Co. NY report is on potato and has been determined to be genotype US-23 (mefenoxam/metalaxyl sensitive). The Cambria Co. PA report is also on potato and does not have a genotype determination at this time. The Long Island, NY report of June 20 has been genotyped as US-23. Reports from greater than one week ago are colored blue on the map, and include NC, NY, and FL. Details can be found at <http://www.usablight.org/>. The website provides location (by county) of positive reports of late blight in the U.S. and further information on disease characteristics and management.

**Current P-Day (Early Blight) and Severity Value (Late Blight) Accumulations (R.V. James, UW-Plant Pathology/R.V. James Designs):** A P-Day value of  $\geq 300$  indicates the threshold for early blight risk and triggers preventative fungicide application. A DSV of  $\geq 18$  indicates the threshold for late blight risk and triggers preventative fungicide application. Red text in table below indicates threshold has been met/surpassed. 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](http://www.plantpath.wisc.edu/wivegdis/contents_pages/pday_sevval_2014.html)

<i>Location</i>	Planting Date	50% Emergence	P-Day Cumulative	Disease Severity Value	Date of DSV Generation
<i>Antigo</i>	Early 5/20	6/9	148	19*	6/27
	Mid 5/27	6/16	101	19*	6/27
	Late 6/6	NA	NA	NA	NA
<i>Grand Marsh</i>	Early 4/20	5/19	308	55*	6/27
	Mid 5/4	6/1	220	50*	6/27
	Late 6/3	6/23	44	12	6/27
<i>Hancock</i>	Early 4/24	5/20	324	25*	6/27
	Mid 5/8	6/2	225	21*	6/27
	Late 6/3	6/24	36	3	6/27
<i>Plover</i>	Early 4/21	5/20	295	39	6/27
	Mid 5/5	6/1	210	36	6/27
	Late 6/5	6/24	33	6	6/27

Please note that we have surpassed the threshold for DSVs (18) in all monitored areas 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 indicate that I have revised the value as displayed in the SureHarvest Blitecast daily output that is found at the UW-Vegetable Pathology website. In some cases, the number of hours of relative humidity above 90% was being issued as a value greater than 24 - giving unusually high DSVs for the individual day. I assigned a maximum DSV of 4 to such dates. 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.

<http://www.plantpath.wisc.edu/wivegdis/pdf/2014/June%206%202014.pdf>

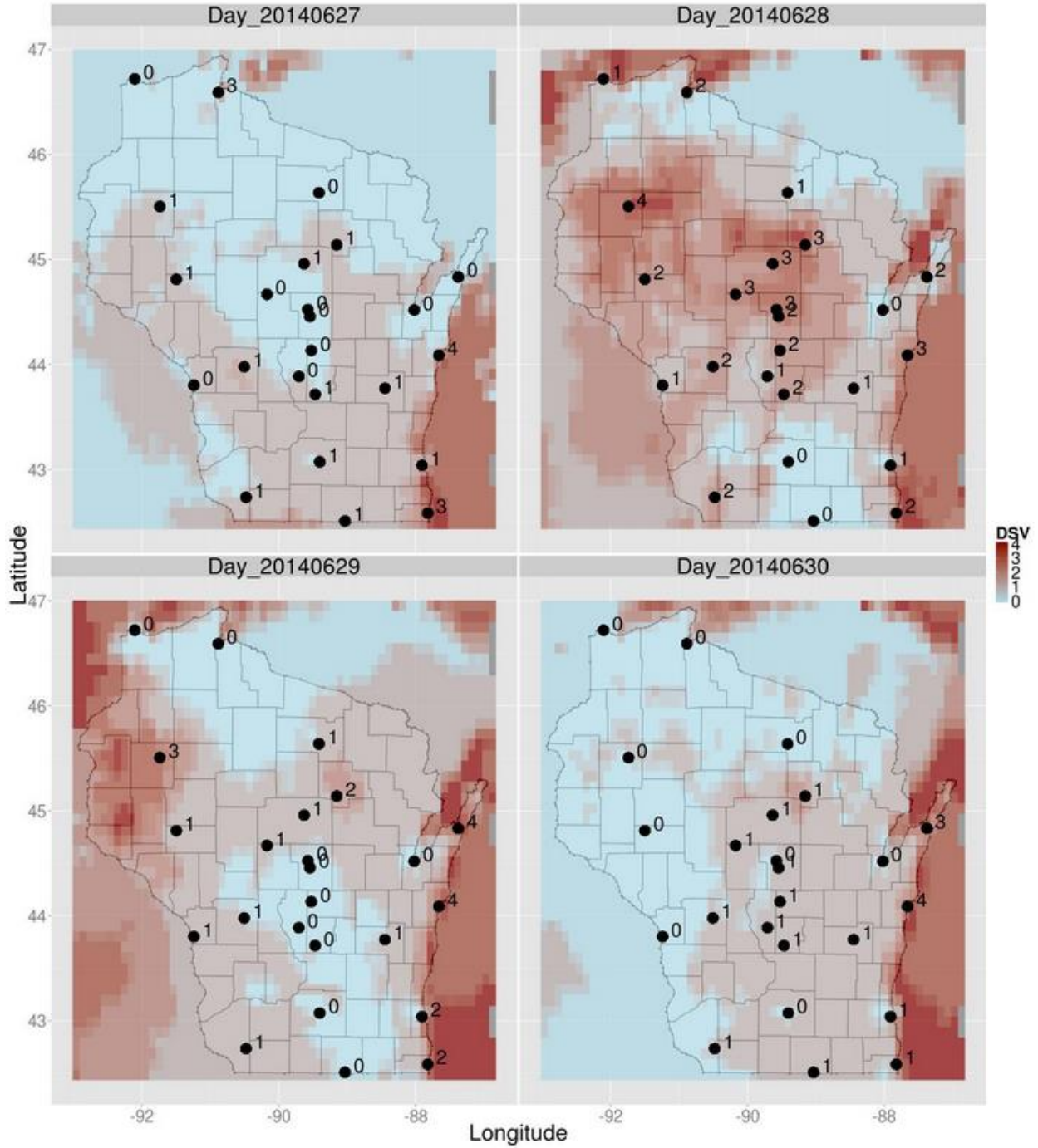
Further details on registered fungicides for WI vegetables can be found in the Univ. of WI Commercial Vegetable Production in WI Guide A3422,

<http://learningstore.uwex.edu/assets/pdfs/A3422.PDF>.

**P-Days and early blight management:** P-Days are over the 300 threshold for early planted potatoes in the Grand Marsh and Hancock areas. I expect that we will reach and surpass the threshold of 300 within 1-4 days at these locations for mid-planted potatoes. Recall, the P-Day 300 threshold is an indicator for timing the initial fungicide application for management of early blight. Early blight lesions are just starting to develop in lower canopies of earliest planted potatoes in southern Wisconsin. I received a commercial report of brown spot (*Alternaria alternata*) in lower canopy of a potato field in Central WI.

**Late blight risk predictions based on forecasted weather for WI (K.E. Frost, UW-Plant Pathology):** Maps below depict DSV accumulations from forecasted weather data (NOAA). Based on forecasted weather, DSV accumulations will be moderate to high in the next 24 hours, with lower accumulations in the following 48 to 72 hours. Blue tone indicates no accumulation;

pink tones indicate accumulation of 1-3; red tone indicates maximum accumulation of 4 DSVs on the given day. Emergence dates do not drive the accumulations in this set of graphs. The graphs are depicting DSVs for a single 24-hour period by location.



**2014 Fungicide Updates in Onion (A.J. Gevens):** Some of the most serious diseases in onion are promoted by wet growing conditions. In early summer 2014, frequent rainfall has challenged disease management in onion in Wisconsin. Precipitation can promote disease and interfere with the timing and persistence of fungicide applications. Prevalent diseases included Botrytis leaf blight and Botrytis neck rot caused by *Botrytis squamosa* and *B. allii*, purple blotch caused by *Alternaria porri*, downy mildew caused by *Peronospora destructor*, and bacterial diseases such as Xanthomonas leaf blight (*Xanthomonas axonopodis* pv. *allii*) and soft rot (*Erwinia* or *Pectobacterium carotovora*) (Fig.1). Production techniques to avoid mechanical and insect damage in the onion crop contribute to disease management.

There are currently over 60 fungicides registered for use on onions in Wisconsin and selection of appropriate materials can be confusing (Table 1). Broad spectrum protectant fungicides with good general disease control are chlorothalonil (for Botrytis leaf blight, purple blotch, anthracnose) and mancozeb (for downy mildew). Disease control is enhanced when applications of protectants are alternated with applications of materials with some systemic activity such as the strobilurins (ie: Quadris, Cabrio, Reason, Pristine), Scala, Rovral, Fontelis, Switch, and Omega (1,2,3). Weekly applications of mancozeb have been shown to provide protection against downy mildew when spray coverage is good and applications begin before disease appears (2). Pristine, Ridomil MZ, Quadris Top, and Inspire Super are also good downy mildew materials and can be used in alternation with mancozeb. Copper-containing materials (ie: Kocide, Champ) are the only true bactericides for limiting diseases such as soft rot and Xanthomonas leaf blight. Coppers must be applied with good coverage and it is critical that they be applied before disease appears. Application of coppers after significant infection offers limited to no control of bacterial diseases. Non-ionic surfactants can aid in improving coverage.



**Figure 1.** Symptoms and signs of common onion diseases in Wisconsin. Left, downy mildew, note gray pathogen sporulation; Right, bacterial soft rot, rot has spread from neck into onion bulb.

**Table 1.** Fungicides labeled for use on onion in Wisconsin (27 June 2014). It is necessary to check labels for appropriate pre-harvest intervals, seasonal use limitations, application or mix requirements, and specific diseases.

<i>Fungicide</i>	<b>Active ingredient</b>	<b>Fungicide Resistance Action Committee Code (FRAC)</b>
<i>Badge SC</i>	copper hydroxide + copper oxychloride	M1
<i>C-O-C-S WDG</i>	copper oxychloride sulfate	M1
<i>Champ DP Dry Prill, Champ WG, Champ Formula 2 Flowable, Champion WP, Kocide 2000, Kocide 3000, Kocide DF, Kentan DF, Nu-Cop 3L, Nu-Cop 50DF</i>	copper hydroxide	M1
<i>Copper-Count-N</i>	copper ammonium complex	M1
<i>Cueva</i>	copper octanoate	M1
<i>Cuprofix Ultra 40 Disperss</i>	basic copper sulfate	M1
<i>Nordox, Nordox 75WG</i>	cuprous oxide	M1
<i>Mastercop</i>	copper sulfate pentahydrate	M1
<i>Cuprofix MZ Disperss</i>	basic copper sulfate + mancozeb	M1 + M3
<i>Mankocide</i>	copper hydroxide + mancozeb	M1 + M3
<i>MicroSulf, Microfine sulfur, Microthiol Disperss, Kumulus DF, Super-Six</i>	sulfur	M2
<i>Dithane DF Rainshield, Dithane F45 Rainshield, Dithane M45, Koverall, Manzate, Manzate Pro-Stick Fungicide, Penncozeb 4FL, 75DF, 80WP</i>	mancozeb	M3
<i>Bravo Zn, Echo Zn, Bravo WeatherStik, Bravo Ultrex, Chloronil 720, Echo 720, Echo 90DF, Chlorothalonil 720SC, Equus 500 Zn, Initiate Zn, Equus 720 SST, Initiate 720, Equus DF</i>	chlorothalonil	M5
<i>Thiophanate Methyl 85-WDG, Topsin 4.5FL, Topsin M 70WDG, Topsin M 70WP, Topsin M WSB, Topsin 4.5FL, T-Methyl 70W WSB, T-Methyl E-AG 4.5F, Cercobin, Incognito 4.5F</i>	thiophanate-methyl	1
<i>Iprodione 4L Ag Fungicide, Rovral 4 Flowable Fungicide, Meteor, Nevado 4F</i>	iprodione	2
<i>Folicur 3.6F, Tebuzol 3.6F, Toledo, Monsoon, Orius 3.6F, Onset 3.6L, Tebustar, Tebu-cop 3.6F, Tebucon 3.6F</i>	tebuconazole	3

<i>Propiconazole E-AG 41.8 EC, Propimax EC, Tilt, AmTide EC, Bumper 41.8EC, Fitness, Propicure 3.6F, Shar-Shield, Topaz</i>	propiconazole	3
<i>Metastar 2E AG, Allegiance, Sebring 2.65ST</i>	metalaxyl	4
<i>Ridomil Gold EC, Ridomil Gold SL, Ultra Flourish, Apron XL</i>	mefenoxam	4
<i>Ridomil Gold Copper</i>	mefenoxam + copper hydroxide	4 + M1
<i>Ridomil Gold MZ WG</i>	mefenoxam + mancozeb	4 + M3
<i>Ridomil Gold Bravo SC</i>	chlorothalonil + mefenoxam	4 + M5
<i>Endura</i>	boscalid	7
<i>Fontelis</i>	penthiopyrad	7
<i>Merivon</i>	fluxapyroxad + pyraclostrobin	7 + 11
<i>Pristine</i>	boscalid + pyraclostrobin	7 + 11
<i>Scala SC</i>	pyrimethanil	9
<i>Vanguard WG</i>	cyprodinil	9
<i>Switch 62.5WG</i>	cyprodinil + fludioxonil	9 + 12
<i>Inspire Super</i>	cyprodinil + difenoconazole	9 + 3
<i>Cabrio EG</i>	pyraclostrobin	11
<i>Dynasty, Heritage, Quadris</i>	azoxystrobin	11
<i>Reason 500SC</i>	fenamidone	11
<i>Quadris, Satori</i>	azoxystrobin	11
<i>Quadris Top</i>	azoxystrobin + difenoconazole	11 + 3
<i>Quilt Excel</i>	azoxystrobin + propiconazole	11 + 3
<i>Quadris Opti</i>	axoxystrobin + chlorothalonil	11 + M5
<i>Tanos</i>	cymoxanil + famoxadone	27 + 11
<i>Cannonball WG</i>	fludioxonil	12
<i>Botran 75W</i>	DCNA Dichloran	14
<i>Oso 5% SC</i>	Polyoxin D zinc salt	19
<i>Actigard 50WG</i>	acibenzolar s-methyl	21
<i>Omega 500f</i>	fluazinam	29
<i>Aliette, Lesion 80 WDG, Linebacker WDG</i>	fosetyl-al	33
<i>Phostrol, Confine Extra, Fosphite, FungiPhite, ProPhyt, Alude, Rampart, Phorcephite, K-Phite 7LP</i>	phosphorous acids, mono- and di-potassium salts, potassium phosphites	33
<i>Viathon</i>	potassium phosphite + tebuconazole	33 + 3
<i>Forum</i>	dimethomorph	40
<i>Revus</i>	mandipropamid	40

<b>Zampro</b>	ametoctradin + dimethomorph	45 + 40
<b>Presidio</b>	fluopicolide	43
<b>Serenade ASO, Serenade MAX, Serenade Optimum, Serenade Soil, Cease</b>	<i>Bacillus subtilis</i> strain QST 713	44
<b>Rhapsody</b>	<i>Bacillus subtilis</i> strain QST 713	44
<b>Sonata</b>	<i>Bacillus pumilis</i> strain QST 2808	44
<b>Actinovate AG</b>	<i>Streptomyces lydicus</i> WYEC 108	bio
<b>Contans WG</b>	<i>Coniothyrium minitans</i> strain CON/M/91-08	bio
<b>Regalia</b>	<i>Reynoutria sachalinensis</i> Group P	bio
<b>SoilGard 12G</b>	<i>Gliricium virens</i> GI-21	bio
<b>Kaligreen</b>	potassium bicarbonate	NC
<b>Trilogy</b>	neem oil	NC
<b>Oxidate</b>	hydrogen dioxide	NC
<b>Rendition, Terra Clean 5.0</b>	hydrogen peroxide; peroxyacetic acid	NC

## References

1. Hausbeck, M.K. and Cortright, B.D. 2010. Onion Disease Control Research Update. Great Lakes Fruit and Vegetable Expo. Grand Rapids, MI. December. Online Proceedings. <http://www.glexpo.com/abstracts/2010abstracts/Onion.pdf>.
2. Hausbeck, M.K. 2010. Crop Advisory Team Alert – Vegetable Newsletter. Michigan State University. Online Newsletter. <http://ipmnews.msu.edu/vegetable/vegetable/tabid/151/articleType/ArticleView/articleId/2829/Downy-mildew-and-foliar-diseases-of-onion.aspx>.
3. Hausbeck, M.K., Wiriyaitsomboon, P., Byrne, J., Rodriguez-Salamanca, L. 2013. Michigan Onion Disease Update. Great Lakes Fruit and Vegetable Expo. Grand Rapids, MI. December. Online Proceedings. <http://veggies.msu.edu/Research/GLOnion2013.pdf>

## UW-Extension/Madison Plant Disease Diagnostic Clinic (PDDC) Update

Brian Hudelson, Ann Joy, Joyce Wu, Tom Hinsenkamp, and Catherine Wendt,  
Plant Disease Diagnostics Clinic

The PDDC receives samples of many plant and soil samples from around the state. The following diseases/disorders have been identified at the PDDC from June 21, 2014 through June 27, 2014.

PLANT/SAMPLE TYPE	DISEASE/DISORDER	PATHOGEN	COUNTY
<b>VEGETABLES</b>			
Pepper	Bacterial Spot	<i>Xanthomonas campestris</i> pv. <i>vesicatoria</i>	Dane
Rhubarb	Ramularia Leaf Spot	<i>Ramularia</i> sp.	Dane
	Slug Injury	None	Dane
Tomato	<a href="#">Herbicide Damage</a>	None	Clark

For additional information on plant diseases and their control, visit the PDDC website at [pddc.wisc.edu](http://pddc.wisc.edu).

**UW Hancock Agricultural Research Station (ARS) Field Day – Dr. Felix Navarro, Superintendent of the Hancock ARS, Hancock, WI:** You are invited to attend the 2014 Potato Field Day at the Hancock Ag. Research Station, Tuesday July 22, from 12:30-5:00 PM. During the Field Day, University of Wisconsin-Madison potato researchers and guest speakers will present their most current research results and crop updates. This is a great opportunity for interaction with UW researchers, growers, and industry on their ongoing research. In addition there will be discussion on the innovative topics of potato genomics, remote sensing technology, and unmanned aerial vehicles and their use in agricultural research and precision farming. We will end the day with informal conversations while enjoying some brats, sweet corn and beer.

Even if your work is not specific to potato, you are welcome to attend and participate in the rich conversations pertaining to advances in agricultural production and future research missions!

**Please mark your calendars!**





**Hancock Ag. Research Station Annual Potato Field Day**  
**"Progress in Agricultural Research to Improve Potato Production and Storage"**

**Field Day Agenda**

Tuesday July 22, 2014 12:30 – 5:00 PM

**Storage Research Facility Portion 12:30 – 1:30pm**

12:30 - 12:40 Dwight Mueller & Felix Navarro – 'Welcome and Introductions-HARS Enhancements'

12:40 - 12:50 Amanda Gevens – 'Updates in storage disease control'

12:50 - 1:10 Robin Buell, MSU- 'New technologies to improve the efficiency of potato breeding'

1:10 - 1:30 Phillip Townsend & Michael Coen – 'Remote sensing applications to field research'

**Field Research Reports 1:35-4:40pm**

1:35 – 1:50 Michael Coen & Phil Townsend (Field E10 North side) – 'UAV and remote sensing applications to field research'

1:50 – 2:05 Shelley Jansky & Paul Bethke (Field E10 North Side) – 'Potential opportunities and challenges to using UAV and remote sensing in potato research'

2:10 - 2:35 Ann MacGuidwin (Field C15 South side) – 'Managing root lesion throughout the rotation'

2:35 - 2:50 Jeff Endelman (Field C14 South side) - 'Potato breeding progress: 'New varieties and future research prospects'

2:55 - 3:10 Russ Groves (Field K9 NE side) – 'IPM & IRM for vegetable insect pests'

3:10 - 3:20 Amy Charkowski (Field K9 SE side) - 'PVY strains and symptoms update'

3:25 - 3:40 Amanda Gevens (Field K9 West side/ by weather station) – 'Disease management'

3:40 - 3:55 Mike Drilias et al. (Field K14 East side) - 'Potato agronomy report'

3:55 – 4:10 Jed Colquhoun (Field R4 North side) – 'Weed management'

4:10 – 4:25 Jiwan Palta (Field S19 North side) – 'Breeding for tuber internal and fry quality'

4:25 - 4:40 Matt Ruark (Field S24 North side) – 'Nitrogen Management'

**Field Day Wrap-up and Announcements 4:45 – 5:00 pm**

4:45 – 5:00 UW, WPVGA and Associate Division Announcements

**Dinner will begin at 5:00 PM**

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