



Vegetable Crop Update

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

No. 6 – May 20, 2018

In This Issue

National late blight updates

Weed management in onion

Horticultural updates

2018 List of fungicides for potato late blight

Calendar of Events

July 10-12, 2018 – Farm Technology Days, Sternweis & Weber's Farms, Marshfield, WI

July 19, 2018 – UW-Hancock Agricultural Research Station Field Day, Hancock, WI

July 26, 2018 – UWEX Langlade County Field Day & Potato Virus Y Detection Training Workshop, Antigo, WI

August 2, 2018 – UW-Rhineland Field Day, Rhineland Agricultural Research Station, WI

November 27-29, 2018 – Processing Crops Conference & MWFPA Annual Convention, Wisconsin Dells, WI

January 15-17, 2019 – Wisconsin Agribusiness Classic, Alliant Energy Center, Madison, WI

January 27-29, 2019 – Wisconsin Fresh Fruit & Vegetable Conference, Kalahari Conference Center, Wisconsin Dells, WI

February 5-7, 2019 – UWEX & WPVGA Grower Education Conference, Stevens Point, WI

Amanda J. Gevens, Associate Professor & Extension Vegetable Plant Pathologist, Interim Co-Director of Wisconsin Seed Potato Certification Program, UW-Madison, Dept. of Plant Pathology, 608-890-3072 (office), Email: gevens@wisc.edu. Webpage: www.plantpath.wisc.edu/wivegdis/

National Late Blight Updates: <http://usablight.org> is again up and running for 2018. **No new cases detected in the past 26 days.** In all cases reported to the usablight website, the pathogen genotype was US-23. This has been the predominant genotype in Wisconsin, and across the U.S., in recent years. US-23 can still generally be managed well with use of phenylamide fungicides such as mefenoxam and metalaxyl (ie: Ridomil). However, a potato sample from northeastern FL was sent to my lab earlier this spring and was the US-8 genotype. This information does pose some additional concern for management as US-8 cannot be managed with phenylamide fungicides as isolates are resistant to the fungicide.

2018 Listing for Fungicides for Potato Late Blight has been updated. No significant changes from 2017. Listing will be available at the Potato & Vegetable Pathology website as well as by link in this newsletter. A higher resolution copy has been sent with this newsletter. Table at the end of this newsletter.

The 2018 A3422 Commercial Vegetable Production in Wisconsin Guide is now available for 2018. As in past years, the guide can be downloaded for free (link below) or a hard copy can be purchased from UWEX Learning Store for \$10. <http://learningstore.uwex.edu/assets/pdfs/A3422.PDF>

Jed Colquhoun, Professor & Extension Specialist, IPM Program Director, UW-Madison, Dept. of Horticulture, Office Phone: 608-279-2142, colquhoun@wisc.edu

Weed control in seeded dry bulb onions: we're off to a challenging start! Weed control in seeded onions is challenging in even the best years: the crop often takes a couple of weeks to get out of the ground, early-season growth is at a glacial pace and the thread-like seedlings are about as uncompetitive with weeds as possible. This year, Mother Nature has added the challenge of record May precipitation, making herbicide applications on muck soils in particular tough to time to the right weed and crop growth stages. And, to make matters worse, while we enjoy numerous registered herbicide options in onions the labels are very complicated. In particular, we need to pay attention to allowed crop growth stages, required intervals between sequential applications, seasonal maximums and pre-harvest intervals. These restrictions are in place not only to meet food tolerance requirements but also to reduce the risk of crop

injury. Applied at the wrong time, too much or too often can severely injure the onion crop. With this complexity in mind and given our challenging year, I've put together the following chart that focuses on these factors. Of course, this isn't meant to be a substitute for the label - just a quick guide to get you started on the season-long planning process! (See table, below. Higher resolution document also attached to Veg Crop Updates Newsletter email)

Seeded Dry Bulb Onion Weed Control

Jed Colquhoun, University of Wisconsin-Madison, colquhoun@wisc.edu

Herbicide Trade name (active ingredient)	Use timing: onion growth stage	Pre-harvest Interval (PHI)	Notes
several trade names (glyphosate)	Before seeding or after harvest		Pre-season burndown or to reduce weed seed production/perennial regrowth after harvest
several trade names (paraquat)	After seeding but prior to crop emergence	60 days	Don't apply to soils lacking clay minerals (such as muck or pure sand)
Nortron SC (ethofumesate)	Pre- or post-emergent	30 days	Mineral soils only. Can kill or severely injure barley nurse crop; somewhat less injurious to oats. Up to 4 foliar applications. Seasonal maximum of 48 oz/A on coarse soils and 96 oz/A on medium- and fine-textured soils
several trade names (bromoxynil)	Pre-emergent (most labels limit to muck only) or post-emergent to 2- to 5-leaf onion		Crop injury can be severe, particularly from post-emergent applications
Dual Magnum (S-metolachlor)	At least 2 true leaves	60 days	Special Local Needs (24c) label for Wisconsin only. Maximum 2 applications; 21 days minimum between applications
Prowl H ₂ O (pendimethalin)	Muck soil: pre-emergence to loop, early post-emergence (2- to 6-leaf) and late post-emergence (6- to 9-leaf) Mineral soil: 2- to 9-leaf	45 days	Sequential application allowances on muck: one pre-emergent, two post-emergent. Mineral soils: not more than 3.2 pts/A/season. Relatively safe on germinated nurse crops
Outlook (dimethenamid)	At least 2 true leaves; A single application of up to 21 oz/A or sequential applications of 10 to 14 oz/A followed by 7 to 11 oz/A at least 14 days later	30 days	Not more than 21 oz/A/season
GoalTender/Goal 2XL (oxyfluorfen)	At least 2 true leaves	45 days	GoalTender: maximum of 1 pt/A/season. Goal 2XL: maximum 2 pt/A/season. Rates vary by formulation - GoalTender has twice the active ingredient per gallon than Goal 2XL
Chateau SW (flumioxazin)	Microrate program: 0.5 to 1.0 oz/A on 2- to 6-leaf onion, at least 7 days between applications Rates higher than 1.0 oz/A: 3- to 6-leaf onion, at least 14 days between applications	45 days	Not more than 3 oz/A/season. Prowl H ₂ O is the only allowable tank-mix partner
Select/Select Max (clethodim)	Apply to small actively growing grasses	45 days	Minimum of 14 days between sequential applications; see labels for seasonal maximum
Fusilade DX (fluzifop)	Apply to small actively growing grasses	45 days	Minimum of 14 days between sequential applications; not more than 48 oz/A/year
Poast (sethoxydim)	Apply to small actively growing grasses	30 days	Not more than 4.5 pt/A/season

Pesticide labels change often - as always, read and follow the label prior to use!

Yi Wang, Assistant Professor & Extension Potato and Vegetable Production Specialist, UW-Madison, Dept. of Horticulture, 608-335-0933, Email: wang52@wisc.edu.

At the Hancock Ag Research Station, maximal soil temperature at the top 2'' has been between 54 and 83°F, and minimal has been between 45 and 57°F over the last couple of weeks. With the warm soil temperature, potato sprouts are growing fast. As of today, we have seen about 5% emergence (shown in Figure 1) across our fresh market, fry processing, and chipping varieties that were planted in the week of May 1st, and the un-emerged sprouts are about 1 to 2'' long (shown in Figure 2). We expect that first hilling could be conducted later next week.



Figure 1. An early emerged plant. Photo taken on May 16.



Figure 2. Un-emerged sprouts are about 1 to 2 inches long. Photo taken on May 16.

2018 Fungicides for Control of Potato Late Blight in Wisconsin (updated 5/20/18)

In-furrow and seed treatments are omitted. List is not comprehensive. Most fungicides listed are for use in conventional production systems. Note where generic fungicide trade names are listed, there may be numerous. **A.J. Gevens, UW-Madison Plant Pathology, 608-575-3029, gevens@wisc.edu**

Trade Name (rate/A)	Active Ingredient(s)	PHI	REI	FRAC #	Comments
<u>Agri Tin, Super Tin 4L, Super Tin 80WP</u> (4-6 fl oz)	triphenyltin hydroxide	7 days	48 hours	30	Restricted use pesticide. 3 fl oz rate can be used if material is tank-mixed with another fungicide.
<u>Alude</u> (1.25 qt in 90 gal water) <u>Confine Extra</u> (3-5 qt in 20 gal water/acre) <u>K-Phite 7LP</u> (1-3 qt in 10 gal water/acre)	mono and dipotassium salts of phosphorous acid	0 days	4 hours	33	Foliar application. Use higher rate when disease pressure is severe. Do not apply at less than 3 day intervals. Do not apply to plants that are dormant or that are heat or moisture stressed.
<u>Ariston</u> (2 pt)	chlorothalonil+ cymoxanil	14 day	12 hours	M5+27	Additional chlorothalonil may be tank-mixed with this formulation to enhance % active ingredient applied (be sure to include the Ariston component in overall season total). Cymoxanil is same active ingredient in Curzate.
<u>Elixir</u> (1.2-2.0 lb)	mancozeb+ chlorothalonil	7 days	24 hours	M3+ M5	Newly registered fungicide for potato only. Use higher rate as vines increase in size.
<u>Fosphite, Rampart</u> (1-4 qt)	potassium phosphite	0 days	4 hours	33	Foliar post-emergence spray and post harvest spray for control in storage. Apply in at least 20 gal water/acre solution.
<u>Fungi-Phite</u> (Foliar: 2 qt/A Seed trt: 15% vol to vol-2 ton in 1 gal solution) <u>Helena Prophyt</u> (4 pt/acre)	potassium phosphite	0 days	4 hours	33	Seed piece spray and foliar post-emergence spray. Tank-mix with another effective fungicide is recommended and use high label rate for late blight control.
<u>Badge SC</u> (1-3 pt)	copper hydroxide, copper oxychloride	0 days	24 hours	M1	Protectant activity only. Apply at 7 to 10 day interval.
<u>Bravo Ultrex</u> (.7 then .9 to 1.36 lb) <u>Bravo WeatherStik, Echo 720, Equus 720 SST, Initiate 720, Chlorothalonil 720 SC, Chloronil 720, Praiz</u> (.75 then 1-1.5 pt) <u>Bravo Zn, Equus 500 Zn, Initiate Zn</u> (1 1/8 then 1.5 to 2.25 pt)	chlorothalonil	7 days	12 hours	M5	11.25 lb a.i./acre maximum on standard label. However, WI has a special 24(c) registration for long season potatoes extending the max a.i. from 11.25 to 16 lb a.i./acre with Bravo (Syngenta) and Echo (Sipcam Advan) formulations.

Trade Name (rate/A)	Active Ingredient(s)	PHI	REI	FRAC #	Comments
<u>Echo Zn</u> (1 to 2.125 pt) <u>Equus DF</u> (.7 then .9 to 1.36 lb) <u>Echo 90DF</u> (5/8 then 7/8 to 1.25 lb)	chlorothalonil	7 days	12 hours	M5	11.25 lb a.i./acre maximum on standard label. However, WI has a special 24(c) registration for long season potatoes extending the max a.i. from 11.25 to 16 lb a.i./acre with Bravo (Syngenta) and Echo (Sipcam Advan) formulations.
<u>Cabrio Plus</u> (2.9 lb)	pyraclostrobin+ metiram	3 days	24 hours	11+M3	17.4 lb/acre maximum per season. Do not apply more than 2 sequential applications.
<u>Champ WG</u> (1 to 1.5 lb 3 to 4 lb in severe areas) <u>Champ Formula 2 Flowable</u> (2/3 to 2 2/3 pt) <u>Champ DP Dry Prill</u> (2/3 to 1 lb 2 to 2 2/3 lb when disease is severe) <u>Kentan DF</u> (1-2.5 lb 4 lb when severe) <u>Kocide 2000, Kocide 3000</u> (.73- 3 lb .5-1.75 lb) <u>Nu-Cop 3L</u> (2/3 to 2 pt 2 to 4 pt if severe) <u>Nu-Cop 50DF</u> (1-1.5 lb 3-4 lb if severe) <u>Previsto</u> (1-3 qt)	copper hydroxide	0 days	24 hours	M1	Use high label rates for foliar late blight protection.
<u>C-O-C-S WDG</u> (1.5- 4 lb) <u>Cuprofix-Ultra 40 Dispers</u> (0.75-3.0 lb)	copper oxychloride, basic copper sulfate	0 days	24 hours	M1	Use high label rates for foliar late blight protection.
<u>Mastercop</u> (0.5-1.5 pt)	copper sulfate pentahydrate	0 days	24 hours	M1	Use high label rates for foliar late blight protection.

Trade Name (rate/A)	Active Ingredient(s)	PHI	REI	FRAC #	Comments
<u>Cueva</u> (2 gal in 50-100 gal water/acre)	copper octanoate	0 days	24 hours	M1	Use high label rates for foliar late blight protection.
<u>Curzate 60DF</u> (3.2 oz foliar)	cymoxanil	14 days	12 hours	27	Locally-systemic fungicide. Must be tank-mixed with a protectant fungicide. Rainfast within 2 hours.
<u>Dithane F45</u> <u>Rainshield</u> (.4 to 1.6 qt) <u>Dithane M45</u> (.5 to 2 lb) <u>Koverall, Roper DF</u> <u>Rainshield, Fortuna</u> <u>75WDG</u> (1-2.0 lb)	mancozeb	24 hours	3 days	M3	Max rate per acre/season is 11.2 lb a.i. Begin use at lower rate and increase as vines increase in size.
<u>Evito 480SC</u> , <u>Aftershock</u> (3.8 fl oz)	fluoxastrobin	7 days	12 hours	11	Follow label for resistance management.
<u>Forum</u> (Foliar and tuber control: 6 oz)	dimethomorph	4 days	12 hours	40	May be tank-mixed with another effective fungicide for enhanced management – but not required by label. Addition of an adjuvant may enhance management. Can be applied after vine kill.
<u>Gavel 75DF</u> (1.5 to 2 lb)	zoxamide+ mancozeb	3 days	48 hours	22+M3	Do not make >6 applications/crop. Contact fungicide.
<u>Gem 500SC</u> (3.8 fl oz)	trifloxystrobin	7 days	12 hours	11	Follow label for resistance management.
<u>Headline</u> (6 to 12 fl oz)	pyraclostrobin	3 days	12 hours	11	Follow label for resistance management.
<u>ManKocide</u> (1.5 to 2 then 4-5 lb)	mancozeb+ copper hydroxide	3 days	24 hours	M3+ M1	Not labeled as a seed trt for potatoes.
<u>Omega 500F</u> (5.5 fl oz)	fluazinam	14 days	48 hours	29	REI is 4 days for high exposure activities. New special local need label 24c in April 2011.
<u>Omega Top MP</u> (5.5 fl oz) – individual label for Omega sold in co- pack with Top MP (difenoconazole)	fluazinam	14 days	48 hours	29	Can be applied aerially. REI is 4 days for high exposure activities.
<u>Orondis</u> (1.4-4.8 fl oz)	oxathiapiprolin (OXTP)	5 days	4 hours	U15	Do not exceed 27.2 fl oz/acre/season. Labels can be confusing due to co-packs. Soon products will be released as pre-mixes. Orondis Ultra A is oxathiapiprolin (OXTP) at 10.2% active ingredient; co-pack partner is Orondis Ultra B which is mandipropamid. Orondis Opti A is also OXTP at 10.2%; co-pack partner is Orondis Opti B which is chlorothalonil. Currently there is a potato supplemental label for the pre-mix Orontis Opti (OXTP+chlorothalonil). Orondis Gold 200 is OXTP; Orondis Gold B is co-pack partner mfenoxam.

<u>Oxidate</u> (40 to 120 fl oz to 100 gal water, 30-100 gal solution per acre)	hydrogen dioxide	0 days	1 hour	NC	Foliar spray for late blight. Frequent applications (5-day intervals) can limit sporulation.
--	------------------	--------	--------	----	--

Trade Name (rate/A)	Active Ingredient(s)	PHI	REI	FRAC #	Comments
Penncozeb 80WP, Penncozeb 75DF (.5 to 2 lb) Penncozeb 4FL, Manzate flowable (.4 to 1.6 qt) <u>Manzate Pro-Stick</u> (1 to 2 lb, seed trt: 1.25 lb/50 gal water)	mancozeb	3 days	24 hours	M3	Do not exceed 11.2 lb a.i./acre/year.
<u>Phostrol</u> (2.5 to 10 pt) (Post harvest trt: 1 gal/ton in .5 gal water)	mono- and di-basic sodium, potassium, and ammonium phosphites	0 days	4 hours	33	Can be applied as a foliar for late blight, pink rot, and Pythium leak. Can be applied post-harvest for storage disease control.
<u>Polyram 80DF</u> (1.5 to 2 lb in 15 gal water/acre minimum)	metiram	3 days	24 hours	M3	Metiram is an EBDC, like mancozeb (M3). Total amount of a.i. per year/acre must include all EBDCs.
<u>Previcur Flex</u> (.7 to 1.2 pt)	propamocarb hydrochloride	14 days	12 hours	F	Apply in a tank-mix with effective protectant. Can be applied as a broadcast or banded application over the row, post-emergence.
<u>Priaxor</u> (4-8 fl oz)	fluxapyroxad+ pyraclostrobin	7 days	12 hours	7+11	Cannot apply more than 3 applications/season. Follow label for resistance management. Xemium and Headline pre-mix.
<u>Quadris, Satori, Willowood Azoxy 2SC, Aframe, Equation SC</u> (6 to 15.5 fl oz) <u>Trevo, Azoxystrar, Azoxyzone</u> (6-20 fl oz)	azoxystrobin	14 days	4 hours	11	Alternate away from Group 11 fungicides to manage resistance.
<u>Quadris Opti</u> (1.6 pt)	azoxystrobin+ chlorothalonil	14 days	12 hours	11+M5	Alternate away from Group 11 fungicides to manage resistance.
<u>Ranman</u> (1.4 to 2.75 fl oz)	cyazofamid	7 days	12 hours	21	Follow label for resistance management.
<u>Reason</u> (5.5 to 8.2 fl oz)	fenamidone	14 days	12 hours	11	Follow label for resistance management.

<u>Revus Top</u> (5.5 to 7 fl oz)	mandipropamid+difenoconazole	14 days	12 hours	40+3	Addition of an adjuvant is recommended.
<u>Tanos</u> (8 to 10 oz)	cymoxanil + famoxadone	14 days	12 hours	27+11	Must be tank-mixed with an effective protectant fungicide.
<u>Ridomil Gold SL</u> (1 to 2 pt)	mefenoxam	14 days	48 hours	4	Do not apply beyond the at-planting stage.
<u>Ridomil Gold Bravo SC</u> (2.5 pt)	mefenoxam+ chlorothalonil	14 days	48 hours	4+M5	Follow label for resistance management.
<u>Ridomil Gold Copper</u> (2 lb)	mefenoxam+ copper hydroxide	14 days	48 hours	4+M1	Tank-mix with an effective protectant.

Trade Name (rate/A)	Active Ingredient(s)	PHI	REI	FRAC #	Comments
<u>Ridomil Gold MZ WG</u> (2.5 lb)	mefenoxam+ mancozeb	3 days	48 hours	4+M3	Follow label for resistance management.
<u>Zampro</u> (11-14 fl oz)	ametoctradin+ dimethomorph	4 days	12 hours	45+40	Do not make more than 2 sequential applications. Follow label for resistance management. Ametoctradin is new a.i.; dimethomorph is Forum (formerly Acrobat).
<u>Zing!</u> (32-34 fl oz)	zoxamide+ chlorothalonil	7 days	12 hours	22+M5	Do not make more than 2 sequential applications before alternating with another fungicide of a different mode of action. Do not make >8 applications or apply >1.52 lb of zoxamide and 8.88 lb of chlorothalonil per season per acre.