



Great Lakes Fruit, Vegetable & Farm Market EXPO Michigan Greenhouse Growers EXPO

December 4-6, 2018

DeVos Place Convention Center, Grand Rapids, MI



47 Onion

Where: Grand Gallery Overlook Room C & D

MI Recertification Credits: 1 (1B, COMM CORE, PRIV CORE)

CCA Credits: CM (0.5)

Moderator: Bruce Klamer, V & W Farms

- 9:00 AM** **Onion Weed Control Update**
- Bernard Zandstra, Michigan State University
- 9:15 AM** **Onion Pathology Update**
- Mary Hausbeck, Michigan State University
- 9:35 AM** **Investigating Spray Coverage in Onions**
- Dennis Van Dyk, Ontario Ministry of Agriculture, Food & Rural Affairs
- 9:50 AM** **Labor-Saving Transplant Tape for Onion Production**
- Cliff Riner, G&R Farms
- 10:20 AM** **Whole-Farm Revenue Protection: A Winning Hand**
- Kylee Zdunic-Rasch, Newwaygo Insurance Agency
- 11:00 AM** **Session Ends**

Onion Pathology Update

Dr. Mary K. Hausbeck, 517-355-4534
Michigan State University, Department of Plant, Soil & Microbial Sciences

Onions are plagued by serious leaf blights caused by fungal pathogens including *Stemphylium*. An aggressive pathogen in Michigan for the last couple of growing seasons, *Stemphylium* is not always readily controlled by the fungicide programs that limit purple blotch. Newly registered fungicides may offer some assistance to limit *Stemphylium* leaf blight and were evaluated (Table 1).

Table 1. Products tested.

Product	Active ingredient	FRAC code ¹	Labeled
Aprovia Top EC	difenoconazole/benzovindiflupyr	3/7	yes
Bravo WeatherStik SC	chlorothalonil	M05	yes
Cabrio WG	pyraclostrobin	11	yes
Luna Experience SC	fluopyram/tebuconazole	7/3	yes
Luna Sensation SC	fluopyram/trifloxystrobin	7/11	no
Manzate Pro-Stick DF	mancozeb	M03	yes
Omega SC	fluazinam	29	yes
Pristine WG	pyraclostrobin/boscalid	11/7	yes
Quadris SC	azoxystrobin	11	yes
Quadris Top SC	azoxystrobin/difenoconazole	11/3	yes
Tebuzol 3.6F	tebuconazole	3	yes
Tilt EC	propiconazole	3	yes

¹Numbers and letters are used to define the fungicide groups by their mode of action. M=multi-site inhibitors. Visit www.frac.info for more information about FRAC codes.

Evaluation of fungicides for control of *Stemphylium* leaf blight of onion.

This study was conducted at a grower cooperator's farm in Hamilton, MI. Onion 'Bradley' seeds were sown 21 April on raised beds that were 6 inches tall and 60 inches wide at the top and spaced 80 inches apart at the row center. Each bed consisted of eight rows of planting spaced 6 inches apart and seeds were spaced 2 inches apart within a row. A completely randomized block design with four replicates was established in an area 100 feet long by seven beds. Each treatment was 20 feet long with a 2-foot buffer section between replicates within a row. Fertilization, weeds and insects were managed by the grower cooperator and were to commercial production standards. Treatments were applied as a foliar spray on 22 and 27 June; 3, 10, 17, and 25 July; and 1, 9, and 15 August. The treatments were applied using a CO₂ backpack sprayer and a broadcast boom equipped with three XR8003 flat-fan nozzles, spaced 18 inches apart, calibrated at 50 psi and delivering 50 gal/A. Disease severity was assessed as the severity of necrotic tissue (0 to 100%) on 31 July; 10, 17 and 24 August from the center 10 feet of the four rows of the treatment plots. Onions from 6 feet of the center four rows of the treatment plots were harvested on 10 September. The bulbs were allowed to dry, then topped, graded, and weighed on 8 October. Data were analyzed using an analysis of variance, with means separation performed using Fisher's protected least significant difference (LSD).

At the first rating date, disease incidence in the untreated control was similar to the following treatments: Quadris SC, Manzate Pro-Stick DF, and Cabrio WG (Figure 1). Disease had progressed rapidly by the second rating with the untreated control presenting 76.3% necrotic tissue. All treatments resulted in less disease than the untreated control on 6 August except Manzate Pro-Stick DF and Cabrio WG. Disease protection began to deteriorate in additional treatments by the third rating on 14 August: Quadris SC, Pristine WG, and Tebuzol SC as well as Manzate Pro-Stick DF and Cabrio WG no longer limited disease in comparison to the untreated control. Meanwhile, Luna Sensation SC and Luna

Experience SC limited disease incidence below 50%. At the final rating date, only Luna Experience SC provided acceptable disease protection at 52.5% necrotic tissue. Luna Experience SC also produced the highest total yield as well as the lowest yield of small bulbs, and the highest yield of both medium and large bulbs.

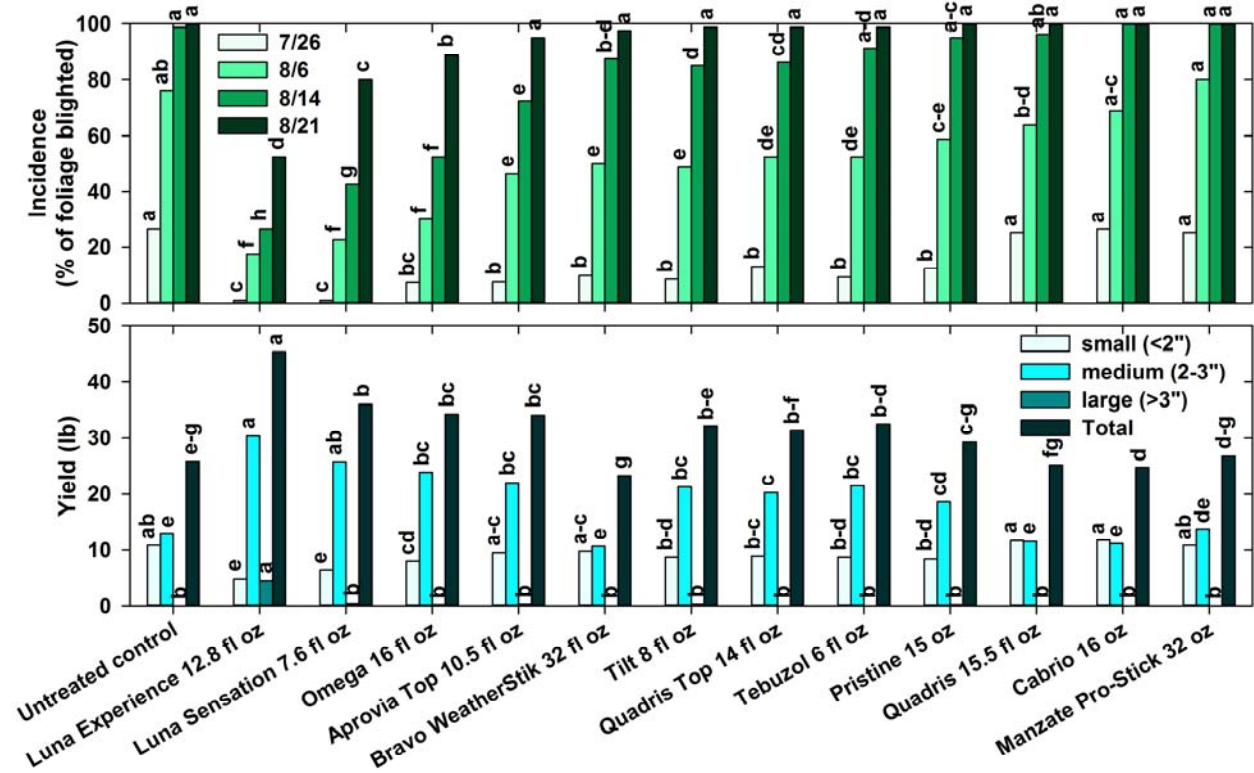


Figure 1. Evaluation of fungicides for control of *Stemphylium* leaf blight on onion: Top graph, disease incidence. Bottom graph, yield. Same-colored bars with a letter in common are not significantly different (t Test LSD; P=0.05).

This research was supported by Project GREEN GR18-073 and the Michigan Onion Committee.

Onion Weed Control Now and Future

Bernard Zandstra
Great Lakes Expo
Grand Rapids, MI
December 5, 2018

Objectives:

1. Determine a safe rate and timing for application of pyroxasulfone (Zidua) on onion
2. Determine potential use of bicyclopyrone (BIR) on onion

Preemergence Weed Control on Muck

- Onions planted: 4/13/18
- Delayed Preemergence: 5/5/18
- PO1: 5/22/18 – 1 LS
- PO2: 5/31/18 – 2 LS

PRE Onion Rating and Yield – Muck Soil – 2018 (1)

		<u>App. Timing</u>	<u>Onion 5/21</u>	<u>Onion 7/05</u>	<u>KG/Plot 8/16</u>
1.	Zidua 0.133 Buctril 0.125 Prowl H ₂ O 1.9	DPRE DPRE PO1, PO2	1.3	1.7	71
2.	Zidua 0.267 Buctril 0.125 Prowl H ₂ O 1.9	DPRE DPRE PO1, PO2	1.3	1.7	64
3.	Prowl H ₂ O 1.9 Buctril 0.125 Prowl H ₂ O 1.9	DPRE DPRE PO1, PO2	1	1.3	74

PRE Onion Rating and Yield – Muck Soil – 2018 (2)

		<u>App. Timing</u>	<u>Onion 5/21</u>	<u>Onion 7/05</u>	<u>KG/Plot 8/16</u>
4.	Prowl H ₂ O 1.9 Buctril 0.125 Zidua 0.133	DPRE, PO2 DPRE PO1	1	1.7	70
5.	Prowl H ₂ O 1.9 Buctril 0.125 Zidua 0.267	DPRE, PO2 DPRE PO1	1	1.3	61
6.	Prowl H ₂ O 1.9 Buctril 0.125 Chateau 0.032	DPRE, PO1, PO2 DPRE PO2	2.7	2	69

PRE Onion Rating and Yield – Muck Soil – 2018 (3)

		<u>App. Timing</u>	<u>Onion 5/21</u>	<u>Onion 7/05</u>	<u>KG/Plot 8/16</u>
7.	Prowl H ₂ O 1.9 Buctril 0.125 Zidua 0.133	DPRE, PO1 DPRE PO2	1	1	76
8.	Prowl H ₂ O 1.9 Buctril 0.125 Zidua 0.267	DPRE, PO1 DPRE PO2	1	1.3	76
9.	Prowl H ₂ O 1.9 Buctril 0.125 BIR 0.033	DPRE, PO1, PO2 DPRE PO1, PO2	1.7	1.7	69

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PRE & Postemergence Weed Control with BIR (1)					
		App. Timing	Onion 5/21	Onion 7/05	KG/Plot 8/16
1.	Prowl H ₂ O 1.9 Buctril 0.125	PRE, PO1, PO2 PRE	1	1.3	41
2.	Prowl H ₂ O 1.9 BIR 0.033 Buctril 0.187	PRE, PO1, PO2 PRE PRE	1	1	43
3.	Prowl H ₂ O 1.9 BIR 0.045 Buctril 0.187	PRE, PO1, PO2 PRE PRE	1	1.3	40

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PRE & Postemergence Weed Control with BIR (2)					
		App. Timing	Onion 5/21	Onion 7/05	KG/Plot 8/16
4.	Prowl H ₂ O 1.9 Buctril 0.125 BIR 0.033	DPRE, PO1, PO2 DPRE DPRE	2.3	1.3	33
5.	Prowl H ₂ O 1.9 Buctril 0.125 BIR 0.045	DPRE, PO1, PO2 DPRE DPRE	2	1.7	40
6.	Prowl H ₂ O 1.9 Buctril 0.125 GoalTender 0.125	DPRE, PO1, PO2 DPRE PO1, PO2, PO3, PO4	2.7	1.3	43

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PRE & Postemergence Weed Control with BIR (3)					
		App. Timing	Onion 5/21	Onion 7/05	KG/Plot 8/16
7.	Prowl H ₂ O 1.9 Buctril 0.125 GoalTender 0.125 BIR 0.033	DPRE, PO1, PO2 DPRE PO1, PO2, PO3, PO4 PO1, PO2, PO3, PO4	2.7	1.3	37
8.	Prowl H ₂ O 1.9 Buctril 0.125 BIR 0.045	DPRE, PO1, PO2 DPRE PO1, PO2, PO3, PO4	1	1	36
9.	BIR 0.033 NIS 0.25% GoalTender 0.125	PO1 PO1 PO2, PO3, PO4	3.3	2.3	31

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Zidua on Mineral Soil (1)					
		App. Timing	Onion 7/05	KG/Plot 8/07	
1.	Zidua 0.066 Buctril 0.187 Prowl H ₂ O 0.95	DPRE DPRE PO1, PO2	4.3*	31*	
2.	Zidua 0.133 Buctril 0.187 Prowl H ₂ O 0.95	DPRE DPRE PO1, PO2	6.7*	8.7*	
3.	Zidua 0.267 Buctril 0.187 Prowl H ₂ O 0.95	DPRE DPRE PO1, PO2	8.3*	2.5*	
	LSD		2.3	27	

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Zidua on Mineral Soil (2)					
		App. Timing	Onion 7/05	KG/Plot 8/07	
4.	Prowl H ₂ O 0.95 Buctril 0.187	DPRE, PO1, PO2 DPRE	1.7	74	
5.	Prowl H ₂ O 0.95 Buctril 0.187 Zidua 0.066	DPRE DPRE PO1	1.3	70	
6.	Prowl H ₂ O 0.95 Buctril 0.187 Zidua 0.133	DPRE DPRE PO1	2.3	46*	
7.	Prowl H ₂ O 0.95 Buctril 0.187 Zidua 0.066	DPRE DPRE PO2	1.7	67	

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Summary - Pyroxasulfone					
1.	Pyroxasulfone (Zidua) is safe on onion PRE on muck soil. It is not safe on onion on mineral soil.				
2.	Zidua improves control of most grasses and broadleaves and yellow nutsedge. It is weak on common lambsquarters, composites, and mustards.				
3.	Normal use rate is 0.066 – 0.133 lb (1.25-2.5 oz); maximum annual rate is 0.267 lb (5 oz)				
4.	Label by 2020?				

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Summary – Bicyclopyrone (BIR)

1. BIR is safe preemergence and postemergence on onion on muck soil.
2. BIR improved ladysthumb control.
3. BIR is most effective when used with other herbicides and weeds are small.
4. BIR is effective against small pigweeds.
5. BIR may be labeled by 2020.

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New Herbicide Labels Coming for Onion

1. **Zidua** – one application
Preemergence or postemergence
2. **Reflex** – one application POST
3. **Ultra Blazer** – one application POST
4. **BIR** – unknown
5. **Stinger** – spot spray

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Be cautious

Onions following red beets that have been treated with clopyralid (**Stinger**) the previous year may suffer carryover injury. Clopyralid stays in the soil for an unknown period of time. Follow-crop interval for onions after Stinger application is 10.5 months on the label. I suggest a 2 year interval to avoid onion injury.



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Summary – Onion Weed Control

1. Delay first herbicide application 1-3 weeks.
2. Apply bromoxynil with the PRE herbicides.
3. Apply PRE and POST herbs every 3-4 wks.
4. **Apply first GoalTender 2-4 fl oz at 1 LS; apply again at 2 LS; maximum 16 fl oz per year; 45 Day PHI**

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Onion Weed Control Timeline (1)

Date	Onion	Action	Group
April 1-30		Seeding onion and barley	
May 1-15		Pre or delayed pre herbicide Prowl H ₂ O + Moxy (2-3 WAP)	3 + 6
May 10-30		Apply graminicide to kill barley (4-6")	1
May	1 LS	GoalTender + Prowl H ₂ O	14 + 3
June	2 LS	GoalTender + Dual Magnum (Yellow nutsedge)	14 + 15

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Weed Control Timeline (2)

Date	Onion	Action	Group	Weeds
June	3 LS	Chateau 2 oz	14	Ladysthumb
June	4 LS	GoalTender Fusilade	14 1	Grasses, com. Purslane, ladysthumb, com. Lambsquarters, redroot pigweed, com. ragweed, hairy nightshade, Eastern black nightshade

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Weed Control Timeline (3)

Date	Onion	Action	Group	Weeds
July	5-6 LS	Chateau 1 oz	14	Ladysthumb, sheperdspurse, spotted spurge, redroot pigweed, common lambsquarters
July	7-8 LS	Dual Magnum	15	Yellow nutsedge, redroot pigweed
Aug 1		GoalTender + Fusilade	14 1	Broadleaves Grasses
Aug 15		Outlook	15	Annual grasses, yellow nutsedge

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Thank You

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