MICHIGAN SUGARBEET REACh
Research & Education Advisory Council

2024 Research Results

REACh/SUGARBEET ADVANCEMENT COMMITTEE LIST
2025 VOTING MEMBERSHIP

23 Voting Members

Company	Name	Terms Expire *Annual Meeting*
Michigan Sugar Company	**Dan Gowen (5th Member)**	**Permanent**
	Joe Hodder	
	Zack Young	
	Corey Guza	
Michigan Sugar Agriculturists (4 years)	**Rob Stoutenburg**	**2028**
	Kevin Messing	**2026**
	Brice Stine	**2027**
Michigan Sugar Company District Board Members (1 year)	**James Guza**	**2026**
	Brandon Bauer (Secretary)	**2026**
	Ben Chaffin (Treasurer)	**2026**
Michigan Sugar Company At Large Growers (3 years)	**Troy Gingrich**	**2026**
	Kyle Crumbaugh	**2028**
	Eric Gentner (*Vice Chair)	**2026** (2/3)
	Mark Sylvester (*Chairman)	**2026** (2/3)
Michigan State University, University of Guelph, and USDA (3 years)	**Linda Hanson**	**2027**
	Amanda Tracey	**2028**
	Jamie Willbur	**2028**
Sugar Beet Seed Company (2 years)	**Dan Bjur**	**2028**
Agri-Business Retail (2 years)	**JJ Metz**	**2026**
Agri-Business Manufacturing (2 years)	**Brian Devine**	**2027**
Michigan Sugar Company Board of Directors (1 year)	**Ben Wilson**	**2026**
	Mike Houghtaling	**2026**
SBA Director	**David Wishowski**	**Permanent**

***Term Limits** (current term/terms allowed)

Ex-Officio Members

Company	Name
Chairman of Board of Directors - MSC	**James Roggenbuck**
CEO of Michigan Sugar Company	**Niel Juhnke**

MICHIGAN SUGARBEET REACh
Research Education Advisory Council

MISSION STATEMENT:

The mission of the ***Michigan Sugarbeet Research Education Advisory Council*** is to be the central trusted source of agronomic information for the sugarbeet industry.

The council will provide direction for the Michigan-Ontario sugarbeet researchers and assemble and distribute research/agronomy information.

Cooperative educational efforts will be conducted with the goal of improving productivity and profitability for all stakeholders.

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MICHIGAN SUGARBEET REACh
Research Education Advisory Council

Sugarbeet Advancement

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USDA

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Research Education Advisory Council

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MICHIGAN SUGAR

2024 Research Results
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Rhizoctonia Crown Rot Product Efficacy Trial

Blumfield West - Richville, MI - 2024

Trial Quality: Fair
Variety: SX-2296 (No Rhizoc)
Planted: May 7
Harvested: October 9
Plots: 6 rows X 38 ft., 4 reps
Row Spacing: 22 in.

Soil Info: Clay Loam
% OM: 2.4 **pH:** 7.6 **CEC:** 12.7
P: Very High **K:** High
Mn: High **B:** Medium
Added N: 36 lbs. 2X2 + 100 lb. sidedress
Prev Crop: Wheat/Raddish

Rhizoc Level: Low
Cerc Control: Good
Problems: None
Seeding Rate: 4.1 in.
Rainfall: 15.10 in.
Beets/100 ft: 209

Application: JD 3520 tractor mounted plot sprayer, compressed air, 30 psi, 15.3 gpa - Foliar 7" band
Monosem 6-row Agronomy planter, compressed air, 30 psi, 9 gpa - IF, 3.5" band

No.	Treatment	Rate/A	Applic Timing	Applic Method	Dead Beets/ 100 ft 19-Aug	RWST	Net $/A	RWSA	T/A	% SUC	% CJP
2	Quadris	10 fl oz	At Plant	In-Furr	**0.2**	**290**	**$1,774**	**8465**	**29.2**	**19.2**	**95.7**
18	Excalia	2 oz	6 lf	Broadcast	**0.4**	**289**	**$1,693**	**8105**	**28.1**	**19.1**	**95.9**
13	Quadris Topsin 4.5**	10 fl oz 20 fl oz	At Plant	In-Furr	**1.3**	**281**	**$1,681**	**8127**	**28.9**	**18.7**	**95.6**
8	Proline	5.7 fl oz	At Plant	In-Furr	**1.3**	**284**	**$1,671**	**8058**	**28.4**	**18.8**	**95.9**
6	Quadris*	12 fl oz	6 lf	Broadcast	**1.3**	**288**	**$1,723**	**8252**	**28.7**	**19.1**	**95.8**
10	Quadris Serifel	10 fl oz 4 oz	At Plant	In-Furr	**1.5**	**282**	$1,518	7338	25.9	**19.0**	**95.1**
4	Quadris	10 fl oz	At Plant	In-Furr	**1.5**	**281**	**$1,734**	**8400**	**29.9**	**18.7**	**95.6**
	Quadris	14.25 fl oz	6 lf	Banded							
17	Excalia Quadris	.64 fl oz 14.25 fl oz	6 lf	Banded	**1.7**	276	$1,541	7520	**27.3**	**18.6**	**95.0**
14	Quadris Topsin 4.5**	10 fl oz 20 fl oz	At Plant	In-Furr	**1.9**	**289**	**$1,728**	**8303**	**28.7**	**19.1**	**95.9**
	Quadris Topsin 4.5	14.25 fl oz 20 fl oz	6 lf	Banded							
20	Quadris	14.25 fl oz	At Plant	In-Furr	**1.9**	**284**	**$1,618**	**7825**	**27.6**	**19.0**	**95.4**
	Excalia	2 oz	6 lf	Broadcast							
3	Quadris	14.25 fl oz	6 lf	Banded	**1.9**	**288**	**$1,711**	**8203**	**28.5**	**19.1**	**95.8**
12	Propulse	13.6 fl oz	At Plant	In-Furr	**2.2**	**287**	**$1,679**	**8086**	**28.2**	**19.1**	**95.6**
1	Inoculated Check				**2.4**	277	$1,467	7119	25.7	**18.6**	**95.2**
5	Quadris*	15.5 fl oz	6 lf	Broadcast	**3.7**	**282**	$1,489	7195	25.5	**18.8**	**95.6**
21	Quadris Proline	9.2 fl oz 5.7 fl oz	At Plant	In-Furr	**3.9**	**279**	**$1,598**	**7808**	**28.0**	**18.6**	**95.4**
	Proline	5.7 fl oz	6 lf	Banded							
9	Proline	5.7 fl oz	At Plant	In-Furr	**4.1**	**282**	**$1,664**	**8061**	**28.6**	**18.7**	**95.9**
	Quadris	14.25 fl oz	6 lf	Banded							
15	Quadris	10 fl oz	At Plant	In-Furr	**4.3**	**284**	**$1,681**	**8114**	**28.5**	**18.8**	**96.0**
	Proline	5.7 fl oz	6 lf	Banded							
19	Excalia Quadris*	2 oz 15.5 fl oz	6 lf	Broadcast	**4.7**	**278**	$1,442	7025	25.2	**18.9**	94.7

***Quadris not labeled for Broadcast**

****Topsin is not labeled for in-furrow applications.**

$/A: Payment calculated using early delivery adjustment where necessary, and the new quality payment minus fungicide and application cost.

Bold: Results are not statistically different from top-ranking treatment in each column.

Rhizoctonia Crown Rot Product Efficacy Trial

Blumfield West - Richville, MI - 2024

No.	Treatment	Rate/A	Applic Timing	Applic Method	Dead Beets/ 100 ft 19-Aug	RWST	Net $/A	RWSA	T/A	% SUC	% CJP
11	Propulse	13.6 fl oz	At Plant	In-Furr	6.0	**286**	$1,556	7541	26.4	**19.0**	**95.6**
	Quadris	14.25 fl oz	6 lf	Banded							
7	Quadris*	15.5 fl oz	18 lf	Broadcast	6.0	273	$1,381	6765	24.8	18.5	94.8
16	Excalia	.64 oz	6 lf	Banded	6.3	277	$1,512	7350	26.6	**18.8**	94.6
Average					2.8	282.7	$1,613	7793.5	27.6	18.9	95.5
LSD %					5.1	11.8	201.6	913.2	3.0	0.6	1.0
CV 5%					130.0	2.9	8.8	8.3	7.7	2.3	0.7

***Quadris not labeled for Broadcast**

****Topsin is not labeled for in-furrow applications.**

Comments: Study was designed to test products for efficacy on Rhizoctonia crown and root rot. All treatments were inoculated in this study. Low Rhizoctonia pressure.

$/A: Payment calculated using early delivery adjustment where necessary, and the new quality payment minus fungicide and application cost.

Bold: Results are not statistically different from top-ranking treatment in each column.

Rhizoctonia Crown Rot Product Efficacy Trial

Gilford - Fairgrove, MI - 2024

Trial Quality: Fair
Variety: SX-2296N
Planted: April 25
Harvested: October 9
Plots: 6 rows X 38 ft., 5 reps
Row Spacing: 22 in.

Soil Info: Clay Loam
% OM: 4.4 **pH:** 8.3 **CEC:** 48.5
P: Very High **K:** Medium
Mn: High **B:** High
Added N: 36 lbs. 2X2 + 100 lb. sidedress
Prev Crop: Corn

Rhizoc Level: Low
Cerc Control: Good
Problems: None
Seeding Rate: 4.1 in.
Rainfall: 11.84 in.
Beets/100 ft: 189

Application: JD 3520 tractor mounted plot sprayer, compressed air, 30 psi, 15.3 gpa - Foliar 7" band
Monosem 6-row Agronomy planter, compressed air, 30 psi, 9 gpa - IF, 3.5" band

No.	Treatment	Rate/A	Applic Timing	Applic Method	Dead Beets/ 100 ft	Vigor*	RWST	Net $/A	RWSA	T/A	% SUC	% CJP
					5-Aug	19-Aug						
22	Non Inoculated Check				**0.0**	**8.3**	**302**	**$1,944**	**9119**	**30.2**	**20.4**	**94.7**
11	Propulse	13.6 fl oz	At Plant	In-Furr	**0.0**	**8.1**	**310**	**$1,958**	**9183**	**29.6**	**20.7**	**95.2**
	Quadris	14.25 fl oz	6 lf	Banded								
8	Proline	5.7 fl oz	At Plant	In-Furr	**0.2**	**8.2**	**315**	**$1,991**	**9226**	**29.3**	**20.5**	**96.6**
4	Quadris	10 fl oz	At Plant	In-Furr	**0.2**	7.8	292	**$1,752**	**8360**	**28.6**	19.9	**94.3**
	Quadris	14.25 fl oz	6 lf	Banded								
20	Quadris	14.25 fl oz	At Plant	In-Furr	**0.4**	**8.1**	**311**	**$1,908**	**8906**	**28.6**	**20.3**	**96.4**
	Excalia	2 oz	6 lf	Broadcast								
12	Propulse	13.6 fl oz	At Plant	In-Furr	**0.4**	**8.1**	**296**	**$1,749**	**8317**	**28.1**	**20.5**	93.6
2	Quadris	10 fl oz	At Plant	In-Furr	**0.6**	**8.3**	**301**	**$1,891**	**8911**	**29.7**	**20.4**	**94.4**
21	Quadris	9.2 fl oz	At Plant	In-Furr	**0.9**	**8.1**	**314**	**$1,934**	**9015**	**28.7**	**20.8**	**95.5**
	Proline	5.7 fl oz	At Plant	In-Furr								
	Proline	5.7 fl oz	6 lf	Banded								
13	Quadris Topsin 4.5***	10 fl oz 20 fl oz	At Plant	In-Furr	**0.9**	**8.1**	**302**	**$1,913**	**9000**	**29.8**	**20.8**	93.6
10	Quadris Serifel	10 fl oz 4 oz	At Plant	In-Furr	**0.9**	**8.3**	**296**	**$1,867**	**8859**	**29.9**	**20.4**	93.7
19	Excalia Quadris**	2 oz 15.5 fl oz	6 lf	Broadcast	**1.1**	7.5	**295**	$1,607	7648	25.9	**20.4**	93.7
15	Quadris	10 fl oz	At Plant	In-Furr	**1.1**	**8.1**	**308**	**$1,902**	**8900**	**28.9**	**20.3**	**96.0**
	Proline	5.7 fl oz	6 lf	Banded								
9	Proline	5.7 fl oz	At Plant	In-Furr	**1.3**	**8.1**	**304**	**$1,904**	**8956**	**29.4**	**20.6**	**94.4**
	Quadris	14.25 fl oz	6 lf	Banded								
16	Excalia	.64 oz	6 lf	Banded	**1.5**	7.6	281	$1,568	7576	27.0	**20.3**	91.9
18	Excalia	2 oz	6 lf	Broadcast	**1.7**	7.6	287	$1,624	7797	27.2	**20.1**	93.1
17	Excalia Quadris	.64 oz 14.25 fl oz	6 lf	Banded	**2.6**	7.6	290	$1,588	7599	26.2	**20.3**	93.1
5	Quadris**	15.5 fl oz	6 lf	Broadcast	**2.6**	7.7	292	$1,658	7899	27.0	**20.7**	92.5
14	Quadris Topsin 4.5***	10 fl oz 20 fl oz	At Plant	In-Furr	**2.6**	**7.9**	**303**	**$1,889**	**8904**	**29.3**	**20.4**	**95.0**
	Quadris Topsin 4.5	14.25 fl oz 20 fl oz	6 lf	Banded								

*__Vigor__ 0 to 10 ratings, 10 is best.

****Quadris not labeled for Broadcast**

*****Topsin is not labeled for in-furrow applications.**

$/A: Payment calculated using early delivery adjustment where necessary, and the new quality payment minus fungicide and application cost.

Bold: Results are not statistically different from top-ranking treatment in each column.

Rhizoctonia Crown Rot Product Efficacy Trial

Gilford - Fairgrove, MI - 2024

No.	Treatment	Rate/A	Applic Timing	Applic Method	Dead Beets/ 100 ft	Vigor*	RWST	Net $/A	RWSA	T/A	% SUC	% CJP
					5-Aug	19-Aug						
6	Quadris**	12 fl oz	6 lf	Broadcast	**3.2**	7.8	**304**	**$1,761**	**8262**	27.1	**20.3**	**95.3**
3	Quadris	14.25 fl oz	6 lf	Banded	**4.1**	7.4	**297**	$1,597	7565	25.5	20.0	**94.9**
7	Quadris**	15.5 fl oz	18 lf	Broadcast	16.4	7.3	293	$1,420	6762	23.0	19.6	**95.4**
1	Inoculated Check				19.4	7.3	**297**	$1,411	6664	22.5	**20.3**	**94.0**
	Average				2.8	7.9	300	$1,765	8338	27.8	20.4	94.4
	LSD 5%				4.8	0.4	20.6	253.7	1041.2	2.6	0.7	2.7
	CV%				119.8	3.3	4.9	10.2	8.8	6.7	2.5	2.0

***Vigor** 0 to 10 ratings, 10 is best.

****Quadris not labeled for Broadcast**

*****Topsin is not labeled for in-furrow applications.**

Comments: Study was designed to test products for efficacy on Rhizoctonia crown and root rot. All treatments, except treatment 22, were inoculated in this study. Low Rhizoctonia pressure.

$/A: Payment calculated using early delivery adjustment where necessary, and the new quality payment minus fungicide and application cost.

Bold: Results are not statistically different from top-ranking treatment in each column.

Rhizoctonia Crown Rot Product Efficacy Trial

Blumfield West & Gilford - 2024

No.	Treatment	Applic Timing	Applic Method	Blumfield West		Gilford	
				Stand B/100 ft	Dead B/100 ft	Stand B/100 ft	Dead B/100 ft
				22-May	19-Aug	8-May	5-Aug
1	Inoculated Check			220.3	**2.4**	170.9	19.4
2	Quadris	At Plant	In-Furr	208.8	**0.2**	**192.0**	**0.6**
3	Quadris	6 lf	Banded	204.3	**1.9**	**195.3**	**4.1**
4	Quadris	At Plant	In-Furr	215.3	**1.5**	**189.7**	**0.2**
	Quadris	6 lf	Banded				
5	Quadris*	6 lf	Broadcast	214.2	**3.7**	**183.8**	**2.6**
6	Quadris*	6 lf	Broadcast	207.8	**1.3**	**187.7**	**3.2**
7	Quadris*	18 lf	Broadcast	204.1	6.0	**190.3**	16.4
8	Proline	At Plant	In-Furr	211.0	**1.3**	**198.9**	**0.2**
9	Proline	At Plant	In-Furr	219.0	**4.1**	**193.5**	**1.3**
	Quadris	6 lf	Banded				
10	Quadris	At Plant	In-Furr	217.5	**1.5**	**194.6**	**0.9**
	Serifel	At Plant	In-Furr				
11	Propulse	At Plant	In-Furr	201.5	6.0	**198.9**	**0.0**
	Quadris	6 lf	Banded				
12	Propulse	At Plant	In-Furr	209.3	**2.2**	**190.5**	**0.4**
13	Quadris	At Plant	In-Furr	221.3	**1.3**	**203.0**	**0.9**
	Topsin 4.5**	At Plant	In-Furr				
14	Quadris	At Plant	In-Furr	212.5	**1.9**	**187.1**	**2.6**
	Topsin 4.5**	At Plant	In-Furr				
	Quadris	6 lf	Banded				
	Topsin 4.5	6 lf	Banded				
15	Quadris	At Plant	In-Furr	218.3	**4.3**	**195.9**	**1.1**
	Proline	6 lf	Banded				
16	Excalia	6 lf	Banded	197.2	6.3	167.7	**1.5**
17	Excalia	6 lf	Banded	195.9	**1.7**	172.6	**2.6**
	Quadris	6 lf	Banded				
18	Excalia	6 lf	Broadcast	213.4	**0.4**	171.8	**1.7**
19	Excalia	6 lf	Broadcast	191.6	**4.7**	173.5	**1.1**
	Quadris*	6 lf	Broadcast				

***Quadris not labeled for Broadcast**

****Topsin is not labeled for in-furrow applications.**

Rhizoctonia Crown Rot Product Efficacy Trial

Blumfield West & Gilford - 2024

No.	Treatment	Applic Timing	Applic Method	Blumfield West		Gilford	
				Stand B/100 ft	Dead B/100 ft	Stand B/100 ft	Dead B/100 ft
				22-May	19-Aug		
20	Quadris	At Plant	In-Furr	**208.6**	**1.9**	**199.1**	**0.4**
	Excalia	6 lf	Broadcast				
21	Quadris Proline	At Plant	In-Furr	**206.9**	**3.9**	**192.2**	**0.9**
	Proline	6 lf	Banded				
22	Non Inoculated Check					**213.4**	**0.0**
Average				209.5	2.8	189.2	2.8
LSD				23.7	5.1	26.3	4.8
CV 5%				8.0	130.0	9.9	119.8

Bold: Results are not statistically different from top-ranking treatment in each column.

***Quadris not labeled for Broadcast**

****Topsin is not labeled for in-furrow applications.**

Valent Excalia broadcast vs Quadris banded

Blumfield West - Richville, MI - 2024

Trial Quality: Fair
Variety: SX-2296N (No Rhizoc)
Planted: May 6
Harvested: October 7
Plots: 6 Rows X 38 ft., 4 Reps
Row Spacing: 22 in.

Soil Info: Clay Loam
% OM: 3 **pH:** 7.8 **CEC:** 12.8
P: Very High **K:** Very High
Mn: High **B:** Medium
Added N: 36 lbs. 2X2 + 100 lbs. sidedress
Previous Crop: Wheat/Raddish

Cerc Control: Good
Problems: None
Seeding Rate: 4.1 in.
Rainfall: 15.10 in.
Beets/100 ft: 189

Application: JD 3520 tractor mounted plot sprayer, compressed air, 15.3 gpa - Foliar 7" band
Monosem 6-row Agronomy Planter, compressed air, 30 psi, 9 gpa - IF, 3.5" band

No.	Treatment	Rate/A	Applic Timing	Applic Method*	Dead Beets / 100 ft 19-Aug	RWST	Net $/A	RWSA	T/A	% SUC	% CJP	B/100 ft 22-May
4	Excalia	2 fl oz	21 days after 2 lf	Broadcast	**2.6**	285	$1,589	7580	**26.5**	19.0	95.5	182
5	Excalia	2 fl oz	2 lf	Broadcast	**3.4**	290	$1,631	7774	**26.9**	19.3	95.5	193
	Excalia	2 fl oz	21 days after 2 lf	Broadcast								
8	Quadris	14.3 fl oz	2 lf	Banded	**4.5**	291	$1,588	7548	**26.0**	19.2	95.8	191
	Quadris	14.3 fl oz	21 days after 2 lf	Banded								
9	Excalia	2 fl oz	4 lf	Broadcast	**5.2**	295	$1,650	7775	**26.4**	19.3	96.5	194
7	Quadris	14.3 fl oz	21 days after 2 lf	Banded	**5.4**	285	$1,504	7177	**25.1**	18.9	95.7	188
3	Excalia	2 fl oz	2 lf	Broadcast	**6.7**	292	$1,656	7835	**26.9**	19.0	96.8	179
10	Excalia	2 fl oz	6 lf	Broadcast	**8.6**	282	$1,404	6714	23.6	18.7	95.9	177
2	Inoculated Check				**10.3**	283	$1,539	7327	**25.8**	18.8	95.7	181
6	Quadris	14.3 fl oz	2 lf	Banded	12.7	253	$1,284	6476	**25.8**	19.2	90.8	180
1	Non Inoculated Check				12.9	260	$1,329	6581	**25.5**	19.1	92.2	**223**
Average					7.2	281	$1,517	7279	25.9	19.1	95.0	189
LSD 5%					9.3	N.S.	N.S.	N.S.	3.0	N.S.	N.S.	21.9
CV%					88.7	12.6	19.0	14.4	8.1	3.3	4.8	8.0

*** Application Dates: 2 lf - 5/23, 4 lf - 5/30, 6 lf - 6/12, 21 days after 2 lf - 6/12**

Comments: This study was designed to evaluate Excalia for control of Rhizoctonia in sugar beet. Low Rhizoctonia pressure.

$/A: Payment calculated using early delivery adjustment where necessary, and the new quality payment minus fungicide and application cost.

Bold: Results are not statistically different from top-ranking treatment in each column.

Valent Rhizoctonia Management

Gilford - Fairgrove, MI - 2024

Trial Quality: Fair
Variety: SX-2296N (No Rhizoc)
Planted: April 25
Harvested: October 9
Plots: 6 Rows X 38 ft., 4 Reps
Row Spacing: 22 in.

Soil Info: Clay Loam
% OM: 4.4 **pH:** 8.3 **CEC:** 48.5
P: Very High **K:** Medium
Mn: High **B:** High
Added N: 36 lbs. 2X2 + 100 lbs. sidedress
Previous Crop: Corn

Cerc Control: Good
Problems: None
Seeding Rate: 4.1 in.
Rainfall: 11.84 in.
Beets/100 ft: 208

Application: JD 3520 tractor mounted plot sprayer, compressed air, 15.3 gpa - Foliar 7" band
Monosem 6-row Agronomy Planter, compressed air, 30 psi, 9 gpa - IF, 3.5" band

No.	Treatment	Rate/A	Applic Timing	Applic Method	Dead Beets / 100 ft	Vigor* 0-10	Net $/A	RWST	RWSA	T/A	% SUC	% CJP	B/100 ft	
					5-Aug	19-Aug							8-May	14-Jun
4	Quadris Quadris	10 fl oz 14.3 fl oz	At Plant 6-8 lf	In-furrow Banded	**0.0**	**8.1**	$1,808	307	8460	**27.6**	**20.6**	**95.1**	**207**	227
2	Non Inoculated Check				**0.4**	**8.1**	**$2,043**	**321**	**9389**	**29.3**	**21.0**	**96.2**	**231**	**253**
5	Kabina Excalia	 2 fl oz	Seed Treatment 6-8 lf	 Broadcast	**1.7**	7.6	$1,718	306	8056	26.4	**20.4**	**95.2**	**208**	162
7	Zeltera Excalia	 2 fl oz	Seed Treatment 6-8 lf	 Broadcast	**1.9**	**7.8**	$1,695	303	7977	26.4	**20.4**	**94.8**	**218**	178
3	Kabina Quadris	 14.3 fl oz	Seed Treatment 6-8 lf	 Banded	**3.4**	7.6	$1,731	**309**	8087	26.2	**20.5**	**95.5**	200	167
6	Zeltera Quadris	 14.3 fl oz	Seed Treatment 6-8 lf	 Banded	**3.7**	7.7	$1,624	**308**	7596	25.2	**20.7**	**95.3**	**210**	173
1	Inoculated Check				18.1	7.3	$1,395	292	6628	22.7	20.1	94.0	182	153
Average					4.2	7.7	$1,716	307	8028	26.2	20.5	95.2	208	188
LSD 5%					5.0	0.3	117.7	13.1	513.8	1.9	0.6	1.7	23.7	20.2
CV%					80.4	2.5	4.6	2.9	4.3	4.9	2.0	1.2	7.7	7.3

***Vigor** 0 to 10 ratings, 10 is the best

Comments: Study was designed to evaluate different Rhizoctonia management strategies in sugar beets. Low Rhizoctonia Pressure.

$/A: Payment calculated using early delivery adjustment where necessary, and the new quality payment minus fungicide and application cost.

Bold: Results are not statistically different from top-ranking treatment in each column.

Evaluation of in-furrow and banded fungicide applications to manage Rhizoctonia root and crown rot, 2024

Chris Bloomingdale and Jaime Willbur, Michigan State University

Location: Frankenmuth (SVREC)	**Treatment Timings:** In-Furrow & Banded (6-8 leaf stage)
Planting Dates: May 31, 2024	**Pesticides:** see table
Soil Type: Loam	**O.M.:** 5.08 **pH:** 7.9
Replicates: 4	**Variety:** BTS-1122

Summary: Significant differences in the percent stand loss were observed among tested program ($P < 0.0001$). Programs 7-10 and the non-inoculated control (No. 2) had lower rates of stand loss, ranging from 0.2 to 2.7%, than the inoculated control, which had a 23.1% stand loss. Root disease index values also differed significantly among fungicide programs ($P < 0.0001$). Programs 6-10 and the non-inoculated control had lower disease indices than the inoculated control. Yield estimates were significantly different among programs ($P < 0.01$). Programs 7-10 and the non-inoculated control had significantly greater yield than the inoculated control. No differences were detected among RWST values. It was noted that programs with a banded application resulted in lower disease and greater yield parameters.

Table 1. End-of-season stand loss, Rhizoctonia root rot index, yield, and RWST from the tested fungicide programs.

No.	Treatment; Rate[a]; Timing[b]	Stand Loss (%)[c,d]	Disease Index (%)[e]	Yield (t/A)	RWST[f]
1	Inoculated Control[g]	23.07 a-c	39.48 ab	1.70 cd	218.0
2	Non-Inoculated Control[g]	2.71 d	0.00 d	4.30 ab	230.1
3	GWN-12047; 32 fl oz; IF	13.38 b-d	24.43 bc	1.68 cd	222.3
4	GWN-12047; 48 fl oz; IF	29.75 a	44.83 a	2.05 b-d	225.3
5	GWN-12047; 64 fl oz; IF	20.04 a-c	25.50 bc	2.15 b-d	213.0
6	Quadris; 13.9 fl oz; IF	8.90 cd	13.95 cd	3.98 a-c	230.4
7	GWN-12047; 48 fl oz; IF GWN-12047; 48 fl oz; B	0.62 d	3.75 d	4.95 a	232.3
8	GWN-12047; 48 fl oz; IF Quadris; 13.9 fl oz; B	0.16 d	6.60 d	4.50 ab	226.9
9	Quadris; 13.9 fl oz; IF GWN-12047; 48 fl oz; B	0.16 d	3.38 d	4.93 a	234.8
10	Quadris; 13.9 fl oz; IF Quadris; 13.9 fl oz; B	0.44 d	1.05 d	4.50 ab	241.1
11	EXP Biocontrol; 14 fl oz; IF	24.88 ab	32.33 ab	1.30 d	215.2
12	EXP Biocontrol; 14 fl oz; IF EXP Biocontrol; 14 fl oz; B	29.20 a	32.05 ab	1.20 d	225.1

[a] All rates are listed as a measure of a product per acre.
[b] In-furrow treatments (IF) were applied at planting (May 31), banded applications (B) were applied at the 6-8 leaf stage (Jul 9).
[c] Stand loss percentages calculated from initial stand counts collected Jun 17 and final dead beet counts collected Sep 10.
[d] Column values followed by the same letter were not significantly different based on Fisher's Protected LSD (α=0.05).
[e] Disease index was calculated by multiplying the Rhizoctonia root rot incidence (0-100%) by the mean symptomatic root severity (1-7) and dividing by 7.
[f] Recoverable white sugar per ton of beets.
[g] Non-treated control.

Evaluating Fungicide Application Timings (BEETcast) for control of Cercospora Leafspot - Answer Plot - Bach, MI - 2024

Trial Quality: Fair
Variety: BTS - 1122, C-G229, SX-2296
Planted: May 16
Harvested: September 30
Plots: 6 rows X 38 ft., 3 reps
Row Spacing: 22 in.

Soil Info: Clay Loam
% OM: 3 **pH:** 7.6 **CEC:** 15.1
P: Very High **K:** Very High
Mn: High **B:** High
Added N: 36 lbs. 2X2 + 100 lbs. sidedress
Previous Crop: Corn

Rhizoc Level: Low
Problems: None
Seeding Rate: 4.1 in.
Rainfall: 10.59 in.
Beets/100 ft: 149

Application: JD 3520 tractor mounted plot sprayer, compressed air, 100 psi, 25 gpa

No.	Treatment	Variety	# of Applic	CLS* Rate 18-Sep	RWST	Net $/A	RWSA	T/A	% SUC	% CJP
5	Less Aggressive	SX-2296	6	**3.2**	**311**	$1,247	5842	18.8	**20.8**	**95.1**
3	More Aggressive	SX-2296	6	**3.7**	**299**	$1,234	5839	19.5	19.9	**95.5**
2	35/35/35	SX-2296	6	5.0	**312**	**$1,498**	**6917**	22.2	**21.1**	**94.4**
4	1st and 15th	SX-2296	6	5.2	**302**	$1,306	6144	20.3	**20.6**	**94.3**
1	Untreated	SX-2296	0	8.8	289	$1,193	5448	18.8	**20.0**	93.8
8	More Aggressive	C-G229	4	**3.2**	**318**	**$1,757**	**7970**	**25.1**	**21.8**	93.8
11	21 Day	C-G229	5	**4.5**	283	**$1,524**	**7242**	**25.5**	18.9	**95.5**
7	Standard	C-G229	4	**4.7**	**316**	**$1,682**	**7639**	**24.1**	**21.5**	**94.3**
9	Less Aggressive Early	C-G229	2	5.0	**302**	$1,431	6560	21.8	**20.3**	**94.8**
10	55/55/55	C-G229	3	6.5	**301**	**$1,640**	**7556**	**25.1**	**20.5**	**94.2**
6	Untreated	C-G229	0	8.3	**297**	$1,426	6462	21.8	**20.5**	93.6
14	More Aggressive	BTS-1122	4	**3.5**	**297**	**$1,645**	**7652**	**25.8**	**20.4**	93.8
13	Standard	BTS-1122	4	**4.7**	**307**	**$1,728**	**7927**	**25.8**	**20.8**	**94.5**
17	21 Day	BTS-1122	5	**4.8**	**300**	**$1,683**	**7820**	**26.1**	**20.4**	**94.4**
15	Less Aggressive Early	BTS-1122	2	6.3	293	**$1,527**	**7053**	**24.1**	**20.0**	**94.3**
16	55/55/55	BTS-1122	3	6.8	**299**	**$1,704**	**7867**	**26.4**	**20.5**	93.8
12	Untreated	BTS-1122	0	9.0	266	$1,423	6711	**25.1**	18.7	93.2
Average				5.5	300	$1,509	6979	23.3	20.4	94.3
LSD 5%				1.6	24.2	297.3	1186.2	2.9	1.8	1.5
CV				17.4	4.9	11.9	10.2	7.5	5.2	1.0

***Cercospora Rating (0-9 Scale): 0 = no spots, 1 = Very few spots, 5 = up to 25% injury and 9 = leaves completely dead**

Comments: Study was designed to compare a CR+ variety to a conventional variety with multiple spray timings. Trial was harvested early so full season effects of leafspot were not observed.

$/A: Payment calculated using early delivery adjustment where necessary, and the new quality payment minus fungicide and application cost.

Bold: Results are not statistically different from top-ranking treatment in each column.

RWSA									
Program	**Trt**	**# Sprays**	**SX-2296**	**Trt**	**# Sprays**	**C-G229**	**Trt**	**# Sprays**	**BTS-1122**
Untreated	1	0	5448	6	0	6462	12	0	6711
Standard	X	X	X	7	4	**7639**	13	4	**7927**
More Aggr	3	6	5839	8	4	**7970**	14	4	**7652**
Less Aggr	5	6	5842	X	X	X	X	X	X
Less Aggr Early	X	X	X	9	2	6560	15	2	**7053**
1st and 15th	4	6	6144	X	X	X	X	X	X
35/35/35	2	6	**6917**	X	X	X	X	X	X
55/55/55	X	X	X	10	3	**7556**	16	3	**7867**
21 Day	X	X	X	11	5	**7242**	17	5	**7820**

RWST									
Program	**Trt**	**# Sprays**	**SX-2296**	**Trt**	**# Sprays**	**C-G229**	**Trt**	**# Sprays**	**BTS-1122**
Untreated	1	0	289	6	0	**297**	12	0	266
Standard	X	X	X	7	4	**316**	13	4	**307**
More Aggr	3	6	**299**	8	4	**318**	14	4	**297**
Less Aggr	5	6	**311**	X	X	X	X	X	X
Less Aggr Early	X	X	X	9	2	**302**	15	2	293
1st and 15th	4	6	**302**	X	X	X	X	X	X
35/35/35	2	6	**312**	X	X	X	X	X	X
55/55/55	X	X	X	10	3	**301**	16	3	**299**
21 Day	X	X	X	11	5	283	17	5	**300**

% Leaf Damage									
Program	**Trt**	**# Sprays**	**SX-2296**	**Trt**	**# Sprays**	**C-G229**	**Trt**	**# Sprays**	**BTS-1122**
Untreated	1	0	8.8	6	0	8.3	12	0	9.0
Standard	X	X	X	7	4	**4.4**	13	4	**4.7**
More Aggr	3	6	**3.7**	8	4	**3.2**	14	4	**3.5**
Less Aggr	5	6	**3.2**	X	X	X	X	X	X
Less Aggr Early	X	X	X	9	2	5.0	15	2	6.3
1st and 15th	4	6	5.2	X	X	X	X	X	X
35/35/35	2	6	5.0	X	X	X	X	X	X
55/55/55	X	X	X	10	3	6.5	16	3	6.8
21 Day	X	X	X	11	5	**4.5**	17	5	**4.8**

Evaluating Fungicide Application Timings (BEETcast) for Control of Cercospora Leafspot - Gilford - Fairgrove, MI - 2024

Trial Quality: Good
Variety: BTS - 1122, C-G229, SX-2296
Planted: April 25
Harvested: October 10
Plots: 6 rows X 38 ft., 3 reps
Row Spacing: 22 in.
Soil Info: Clay Loam
% OM: 4.4 **pH:** 8.3 **CEC:** 48.5
P: Very High **K:** Medium
Mn: High **B:** High
Added N: 36 lbs. 2X2 + 100 lbs. sidedress
Previous Crop: Corn
Rhizoc Level: Low
Problems: None
Seeding Rate: 4.1 in.
Rainfall: 11.84 in.
Beets/100 ft: 127
Application: JD 3520 tractor mounted plot sprayer, compressed air, 100 psi, 25 gpa

No.	Treatment	Variety	# of Applic	CLS* Rate 8-Oct	RWST	Net $/A	RWSA	T/A	% SUC	% CJP
4	1st and 15th	SX-2296	7	**4.7**	**276**	**$1,697**	**8645**	**31.3**	**18.9**	**94.3**
3	More Aggressive	SX-2296	7	**5.0**	**266**	**$1,707**	**8858**	**33.2**	**18.4**	**93.8**
2	35/35/35	SX-2296	6	**5.2**	264	**$1,559**	8106	30.7	**18.2**	**94.0**
5	Less Aggressive	SX-2296	6	5.8	**271**	**$1,674**	**8550**	**31.5**	**18.8**	93.6
1	Untreated	SX-2296	0	9.0	233	$1,300	6840	29.2	16.5	93.3
11	21 Day	C-G229	5	**3.7**	264	$1,264	**9006**	**34.1**	**18.0**	**94.6**
7	Standard	C-G229	4	**5.0**	**270**	**$1,811**	**9116**	**33.7**	**18.1**	**95.4**
8	More Aggressive	C-G229	4	**5.2**	**281**	**$1,792**	**8889**	**31.6**	**18.8**	**95.3**
10	55/55/55	C-G229	3	**5.3**	**266**	**$1,756**	**8901**	**33.7**	**18.3**	**94.2**
9	Less Aggressive Early	C-G229	2	7.3	**265**	**$1,781**	**8960**	**33.8**	**18.0**	**94.8**
6	Untreated	C-G229	0	9.0	239	$1,352	7037	29.4	16.2	**95.4**
17	21 Day	BTS-1122	5	**5.2**	260	**$1,675**	**8632**	**33.2**	17.7	**94.7**
14	More Aggressive	BTS-1122	4	6.2	253	**$1,636**	**8507**	**33.6**	17.4	**94.3**
13	Standard	BTS-1122	4	6.8	261	**$1,652**	**8468**	**32.5**	**18.2**	93.6
16	55/55/55	BTS-1122	3	7.5	254	**$1,565**	8100	**31.9**	17.9	93.1
15	Less Aggressive Early	BTS-1122	2	7.7	247	**$1,568**	8178	**33.0**	17.4	93.2
12	Untreated	BTS-1122	0	9.0	220	$1,125	6110	27.7	15.7	92.9

Average	6.3	258	$1,583	8288	32.0	17.8	94.1
LSD 5%	1.6	15.7	407.3	788.6	3.2	0.9	1.6
CV	15.2	3.7	15.5	5.7	6.0	2.9	1.0

***Cercospora Rating (0-9 Scale): 0 = no spots, 1 = Very few spots, 5 = up to 25% injury and 9 = leaves completely dead**

Comments: Study was designed to compare a CR+ variety to a conventional variety with multiple spray timings. Ratings and harvest were taken late season.

$/A: Payment calculated using early delivery adjustment where necessary, and the new quality payment minus fungicide and application cost.

Bold: Results are not statistically different from top-ranking treatment in each column.

Evaluating Fungicide Application Timings (BEETcast) for control of Cercospora Leafspot - Gilford - Fairgrove, MI - 2024

RWSA

Program	Trt	# Sprays	SX-2296	Trt	# Sprays	C-G229	Trt	# Sprays	BTS-1122
Untreated	1	0	6840	6	0	7037	12	0	6110
Standard	X	X	X	7	4	**9116**	13	4	**8468**
More Aggr	3	7	**8858**	8	4	**8889**	14	4	**8507**
Less Aggr	5	6	**8550**	X	X	X	X	X	X
Less Aggr Early	X	X	X	9	2	**8960**	15	2	8178
1st and 15th	4	7	**8645**	X	X	X	X	X	X
35/35/35	2	6	8106	X	X	X	X	X	X
55/55/55	X	X	X	10	3	**8901**	16	3	8100
21 Day	X	X	X	11	5	**9006**	17	5	**8632**

RWST

Program	Trt	# Sprays	SX-2296	Trt	# Sprays	C-G229	Trt	# Sprays	BTS-1122
Untreated	1	0	233	6	0	239	12	0	220
Standard	X	X	X	7	4	**270**	13	4	261
More Aggr	3	7	**266**	8	4	**281**	14	4	253
Less Aggr	5	6	**271**	X	X	X	X	X	X
Less Aggr Early	X	X	X	9	2	**265**	15	2	247
1st and 15th	4	7	**276**	X	X	X	X	X	X
35/35/35	2	6	264	X	X	X	X	X	X
55/55/55	X	X	X	10	3	**266**	16	3	254
21 Day	X	X	X	11	5	264	17	5	260

% Leaf Damage

Program	Trt	# Sprays	SX-2296	Trt	# Sprays	C-G229	Trt	# Sprays	BTS-1122
Untreated	1	0	9.0	6	0	9.0	12	0	9.0
Standard	X	X	X	7	4	**5.0**	13	4	6.8
More Aggr	3	7	**5.0**	8	4	**5.2**	14	4	6.2
Less Aggr	5	6	5.8	X	X	X	X	X	X
Less Aggr Early	X	X	X	9	2	7.3	15	2	7.7
1st and 15th	4	7	**4.7**	X	X	X	X	X	X
35/35/35	2	6	**5.2**	X	X	X	X	X	X
55/55/55	X	X	X	10	3	**5.3**	16	3	7.5
21 Day	X	X	X	11	5	**3.7**	17	5	**5.2**

Evaluating Fungicide Application Timings (BEETcast) for control of Cercospora Leafspot - Gilford & Answer Plot

No.	Program	Treatment**	App	Rate/A	Gilford		Answer	
					Date	DSV	Date	DSV
1	UTC - SX-2296							
2	35/35/35	EBDC*	A	2 lb	27-Jun	35	2-Jul	35
	SX-2296	Delaro + Proline + EBDC*	B	11 fl oz + 1.6 fl oz + 2 lb	11-Jul	70	17-Jul	70
		Super Tin + Topsin + EBDC*	C	8 fl oz + 20 fl oz + 2 lb	22-Jul	105	1-Aug	105
		Inspire XT + EBDC*	D	7 fl oz + 2lb	9-Aug	140	14-Aug	140
		Super Tin + EBDC*	E	8 fl oz + 2 lb	30-Aug	175	5-Sep	165
		EBDC*	F	2 lb	11-Sep	200	13-Sep	205
3	More Aggr	EBDC*	A	2 lb	27-Jun	35	8-Jul	51
	SX-2296	Delaro + Proline + EBDC*	B	11 fl oz + 1.6 fl oz + 2 lb	11-Jul	70	22-Jul	85
		Super Tin + Topsin + EBDC*	C	8 fl oz + 20 fl oz + 2 lb	22-Jul	105	1-Aug	105
		Inspire XT + EBDC*	D	7 fl oz + 2lb	2-Aug	129	14-Aug	140
		Super Tin + EBDC*	E	8 fl oz + 2 lb	12-Aug	146	27-Aug	158
		EBDC* + Badge	F	2 lb + 2 pt	30-Aug	175	10-Sep	185
		Priaxor + Badge	G	8 fl oz + 2 pt	11-Sep	200	X	X
4	1st and 15th	EBDC*	A	2 lb	27-Jun	35	8-Jul	51
	SX-2296	Delaro + Proline + EBDC*	B	11 fl oz + 1.6 fl oz + 2 lb	2-Jul	54	17-Jul	70
		Super Tin + Topsin + EBDC*	C	8 fl oz + 20 fl oz + 2 lb	15-Jul	92	1-Aug	105
		Inspire XT + EBDC*	D	7 fl oz + 2lb	29-Jul	117	13-Aug	139
		Super Tin + EBDC*	E	8 fl oz + 2 lb	15-Aug	150	3-Sep	169
		EBDC* + Badge	F	2 lb + 2 pt	3-Sep	187	13-Sep	205
		Priaxor + Badge	G	8 fl oz + 2 pt	11-Sep	200	X	X
5	Less Aggr	Delaro + Proline + EBDC*	A	11 fl oz + 1.6 fl oz + 2 lb	27-Jun	35	8-Jul	51
	SX-2296	Super Tin + Topsin + EBDC*	B	8 fl oz + 20 fl oz + 2 lb	12-Jul	83	24-Jul	95
		Inspire XT + EBDC*	C	7 fl oz + 2lb	29-Jul	117	8-Aug	115
		Super Tin + EBDC*	D	8 fl oz + 2 lb	12-Aug	146	13-Aug	139
		Priaxor + Badge	E	8 fl oz + 2 pt	30-Aug	175	23-Aug	152
		EBDC*	F	2 lb	11-Sep	200	11-Sep	187
6	UTC - C-G229							
7	Standard	EBDC*	A	2 lb	27-Jun	35	8-Jul	51
	C-G229	Delaro + Proline + EBDC*	B	11 fl oz + 1.6 fl oz + 2 lb	2-Jul	54	17-Jul	70
		Super Tin + Topsin + EBDC*	C	8 fl oz + 20 fl oz + 2 lb	29-Jul	117	13-Aug	139
		Inspire XT + EBDC*	D	7 fl oz + 2lb	3-Sep	187	3-Sep	169
8	More Aggr	Delaro + Proline + EBDC*	A	11 fl oz + 1.6 fl oz + 2 lb	2-Jul	54	17-Jul	70
	C-G229	Super Tin + Topsin + EBDC*	B	8 fl oz + 20 fl oz + 2 lb	22-Jul	105	5-Aug	110
		Inspire XT + EBDC*	C	7 fl oz + 2lb	12-Aug	146	27-Aug	158
		Super Tin + EBDC*	D	8 fl oz + 2 lb	3-Sep	187	3-Sep	169
9	Less Aggr Early	Delaro + Proline + EBDC*	A	11 fl oz + 1.6 fl oz + 2 lb	3-Jul	55	22-Jul	85
	C-G229	Super Tin + Topsin + EBDC*	B	8 fl oz + 20 fl oz + 2 lb	7-Aug	140	20-Aug	151
10	55/55/55	Delaro + Proline + EBDC*	A	11 fl oz + 1.6 fl oz + 2 lb	3-Jul	55	11-Jul	61
	C-G229	Super Tin + Topsin + EBDC*	B	8 fl oz + 20 fl oz + 2 lb	25-Jul	110	1-Aug	105
		Inspire XT + EBDC*	C	7 fl oz + 2lb	20-Aug	165	4-Sep	169
11	21 Day	EBDC*	A	2 lb	27-Jun	35	8-Jul	51
	C-G229	Delaro + Proline + EBDC*	B	11 fl oz + 1.6 fl oz + 2 lb	3-Jul	55	22-Jul	85
		Super Tin + Topsin + EBDC*	C	8 fl oz + 20 fl oz + 2 lb	26-Jul	112	8-Aug	115
		Inspire XT + EBDC*	D	7 fl oz + 2lb	15-Aug	150	30-Aug	165
		Super Tin + EBDC*	E	8 fl oz + 2 lb	6-Sep	190	13-Sep	205

*** EBDC = Manzate Pro-stick**

****All Treatments included MasterLock @ 6.4 fl oz**

Evaluating Fungicide Application Timings (BEETcast) for control of Cercospora Leafspot - Gilford & Answer Plot

No.	Program	Treatment**	App	Rate/A	Gilford		Answer	
					Date	DSV	Date	DSV
12	UTC - BTS-1122							
13	Standard	EBDC*	A	2 lb	27-Jun	35	8-Jul	51
	BTS-1122	Delaro + Proline + EBDC*	B	11 fl oz + 1.6 fl oz + 2 lb	2-Jul	54	17-Jul	70
		Super Tin + Topsin + EBDC*	C	8 fl oz + 20 fl oz + 2 lb	29-Jul	117	13-Aug	139
		Inspire XT + EBDC*	D	7 fl oz + 2lb	3-Sep	187	3-Sep	169
14	More Aggr	Delaro + Proline + EBDC*	A	11 fl oz + 1.6 fl oz + 2 lb	2-Jul	54	17-Jul	70
	BTS-1122	Super Tin + Topsin + EBDC*	B	8 fl oz + 20 fl oz + 2 lb	22-Jul	105	5-Aug	110
		Inspire XT + EBDC*	C	7 fl oz + 2lb	12-Aug	146	27-Aug	158
		Super Tin + EBDC*	D	8 fl oz + 2 lb	3-Sep	187	3-Sep	169
15	Less Aggr Early	Delaro + Proline + EBDC*	A	11 fl oz + 1.6 fl oz + 2 lb	3-Jul	55	22-Jul	85
	BTS-1122	Super Tin + Topsin + EBDC*	B	8 fl oz + 20 fl oz + 2 lb	9-Aug	140	20-Aug	151
16	55/55/55	Delaro + Proline + EBDC*	A	11 fl oz + 1.6 fl oz + 2 lb	3-Jul	55	11-Jul	61
	BTS-1122	Super Tin + Topsin + EBDC*	B	8 fl oz + 20 fl oz + 2 lb	25-Jul	110	1-Aug	105
		Inspire XT + EBDC*	C	7 fl oz + 2lb	20-Aug	165	4-Sep	169
17	21 Day	EBDC*	A	2 lb	27-Jun	35	8-Jul	51
	BTS-1122	Delaro + Proline + EBDC*	B	11 fl oz + 1.6 fl oz + 2 lb	3-Jul	55	22-Jul	85
		Super Tin + Topsin + EBDC*	C	8 fl oz + 20 fl oz + 2 lb	26-Jul	112	8-Aug	115
		Inspire XT + EBDC*	D	7 fl oz + 2lb	15-Aug	150	30-Aug	165
		Super Tin + EBDC*	E	8 fl oz + 2 lb	6-Sep	190	13-Sep	205

Cercospora Fungicide Efficacy
Answer Plot - Bach, MI - 2024

Trial Quality: Fair
Variety: SX-2296
Planted: May 16
Harvested: October 1
Plots: 6 rows X 38 ft., 4 reps
Row Spacing: 22 in.

Soil Info: Clay Loam
% OM: 3 **pH:** 7.6 **CEC:** 15.1
P: Very High **K:** Very High
Mn: High **B:** High
Added N: 36 lbs. 2X2 + 100 lbs. sidedress
Previous Crop: Corn

Rhizoc Level: Low
Problems: None
Seeding Rate: 4.1 in.
Rainfall: 10.69 in.
Beets/100 ft: 168

Application: JD 3520 tractor mounted plot sprayer, compressed air, 100 psi, 25 gpa

No.	Treatment*	Rate/A	Applic Timing	CLS*** Rate 19-Sep	RWST	Net $/A	RWSA	T/A	% SUC	% CJP
9	EBDC**	2 lb	A, C,E	**3.6**	287	**$1,232**	**5778**	20.1	19.3	**95.2**
	Super Tin	8 fl oz	B, D							
22	EBDC**	2 lb	A, C, E	**3.7**	**295**	**$1,324**	**6262**	**21.3**	19.8	**94.9**
	Luna Flex + Propulse	13.6 fl oz + 13.6 fl oz	B, D							
3	EBDC**	2 lb	A, C, E	**3.7**	**290**	**$1,244**	**5853**	**20.3**	19.4	**95.3**
	Proline	5.7 fl oz	B, D							
23	EBDC**	2 lb	A, C, E	**3.8**	284	$1,105	5277	18.6	19.1	**94.9**
	Phobos FC	7.6 fl oz	B, D							
19	EBDC**	2 lb	A - E	**3.8**	**296**	**$1,198**	5555	18.7	**19.9**	**95.0**
10	EBDC**	2 lb	A, C , E	**3.8**	276	$1,151	5497	19.8	18.9	**94.3**
	Super Tin + Topsin 4.5 FL	8 fl oz + 20 fl oz	B, D							
16	EBDC**	2 lb	A, C, E	**3.9**	**290**	**$1,223**	**5712**	19.6	19.3	**95.7**
	Copper**	2 pt	B, D							
11	EBDC**	2 lb	A, C, E	**3.9**	293	**$1,324**	**6192**	**21.2**	19.7	**95.0**
	Minerva Duo	16 fl oz	B, D							
25	EBDC**	2 lb	A, C, E	**3.9**	287	**$1,243**	**5892**	**20.5**	19.2	**95.5**
	Phobos FC + Priaxor	7.6 fl oz + 8 fl oz	B, D							
13	EBDC**	2 lb	A, C, E	**3.9**	288	**$1,313**	**6197**	**21.6**	19.4	**95.0**
	Delaro + Proline	11 fl oz + 1.6 fl oz	B, D							
2	EBDC**	2 lb	A, C, E	**3.9**	**290**	**$1,438**	**6723**	**23.2**	19.3	**95.5**
	Inspire XT	7 fl oz	B, D							
20	EBDC**	2 lb	A, C, E	**4.0**	**298**	**$1,310**	**6171**	**20.7**	**19.9**	**95.3**
	Delaro + Luna Privilege + Proline	11 fl oz + 2 fl oz + 1.7 fl oz	B, D							
15	EBDC**	2 lb	A, C, E	**4.1**	283	**$1,280**	**6109**	**21.6**	19.2	**94.6**
	Revytek	15 fl oz	B, D							
21	EBDC**	2 lb	A, C, E	**4.1**	280	**$1,309**	**6196**	**22.1**	19.2	**94.3**
	Luna Flex	13.6 fl oz	B, D							
24	EBDC**	2 lb	A, C, E	**4.3**	**294**	**$1,296**	**6148**	**20.9**	19.7	**95.1**
	Phobos FC + Headline	7.6 fl oz + 12 fl oz	B, D							

***All treatments included MasterLock @ 6.4 fl oz**

****EBDC = Manzate Pro-Stick, Copper = Badge**

***** Cercospora Rate (0-9 Scale): 0 = no spots, 1 = Very few spots, 5 = up to 25% injury and 9 = leaves completely dead.**

$/A: Payment calculated using early delivery adjustment where necessary, and the new quality payment minus fungicide and application cost.
Bold: Results are not statistically different from top-ranking treatment in each column.

Cercospora Fungicide Efficacy

Answer Plot - Bach, MI - 2024

No.	Treatment**	Rate/A	Applic Timing	CLS*** Rate 19-Sep	RWST	Net $/A	RWSA	T/A	% SUC	% CJP
17	EBDC**	2 lb	A, C, E	**4.3**	278	$1,128	5444	19.6	18.9	**94.7**
	Priaxor + Topsin 4.5 FL	8 fl oz + 20 fl oz	B, D							
7	EBDC**	2 lb	A, C, E	**4.3**	**290**	**$1,342**	**6305**	**21.8**	19.7	**94.4**
	Provysol	5 fl oz	B, D							
6	EBDC**	2 lb	A, C, E	**4.3**	285	**$1,197**	**5658**	19.8	19.1	**95.5**
	Minerva	13 fl oz	B, D							
4	EBDC**	2 lb	A, C, E	**4.3**	**295**	**$1,343**	**6251**	**21.2**	**21.9**	91.7
	Topguard EQ	14 fl oz	B, D							
5	EBDC**	2 lb	A, C, E	**4.3**	289	**$1,209**	**5657**	19.6	19.3	**95.4**
	Enable	8 fl oz	B, D							
12	EBDC**	2 lb	A, C, E	4.6	286	**$1,218**	**5809**	**20.3**	19.2	**95.3**
	Propulse	13.6 fl oz	B, D							
18	EBDC**	2 lb	A, C, E	4.6	280	$1,103	5287	18.9	19.0	**94.7**
	Veltyma	10 fl oz	B, D							
14	EBDC**	2 lb	A, C, E	4.7	280	**$1,273**	**6040**	**21.5**	18.7	**95.7**
	Lucento	5.5 fl oz	B, D							
8	EBDC**	2 lb	A, C, E	4.8	**315**	**$1,310**	**5946**	18.5	**21.4**	**94.5**
	Priaxor	8 fl oz	B, D							
1	Untreated			6.4	277	$1,021	4769	17.2	18.9	**94.6**
Average				4.2	288	$1,245	5869	20.3	19.5	94.9
LSD 5%				0.7	24.7	260.9	1068.9	3.0	2.0	1.9
CV %				12.5	6.1	14.9	12.9	10.4	7.5	1.4

***All treatments included MasterLock @ 6.4 fl oz**

****EBDC = Manzate Pro-Stick, Copper = Badge**

*****Cercospora Rate (0-9 Scale): 0 = no spots, 1 = Very few spots, 5 = up to 25% injury and 9 = leaves completely dead.**

Comments: Study was designed to test products for Cercospora leafspot efficacy. Cercospora and Alternaria leafspot developed late in this trial.

$/A: Payment calculated using early delivery adjustment where necessary, and the new quality payment minus fungicide and application cost.

Bold: Results are not statistically different from top-ranking treatment in each column.

Cercospora Fungicide Efficacy

Gilford - Fairgrove, MI - 2024

Trial Quality: Good
Variety: SX-2296
Planted: April 25
Harvested: October 10
Plots: 6 rows X 38 ft., 4 reps
Row Spacing: 22 in.

Soil Info: Clay Loam
% OM: 4.4 **pH:** 8.3 **CEC:** 48.5
P: Very High **K:** Medium
Mn: High **B:** High
Added N: 36 lbs. 2X2 + 100 lbs. sidedress
Previous Crop: Corn

Rhizoc Level: Low
Problems: None
Seeding Rate: 4.1 in.
Rainfall: 11.84 in.
Beets/100 ft: 137

Application: JD 3520 tractor mounted plot sprayer, compressed air, 100 psi, 25 gpa

No.	Treatment*	Rate/A	Applic Timing	CLS*** Rate 8-Oct	RWST	Net $/A	RWSA	T/A	% SUC	% CJP
16	EBDC**	2 lb	A, C, E	**5.3**	**261**	**$1,598**	**8094**	**31.0**	**18.6**	**92.6**
	Copper**	2 pt	B, D							
28	EBDC**	2 lb	A, C, E	**5.5**	**260**	**$1,488**	**7569**	29.1	**18.5**	**92.8**
	EBDC + Copper**	2 lb + 2 pt	B, D							
27	EBDC**	2 lb	A, C, E	**5.9**	**264**	**$1,598**	**8058**	**30.5**	**18.3**	**94.0**
	EBDC** + Curezin + Salia	2 lb + 1.5 pt + 4 fl oz	B,D							
19	EBDC**	2 lb	A-E	**6.3**	**249**	**$1,466**	**7592**	**30.5**	**18.2**	91.5
25	EBDC**	2 lb	A, C, E	**6.4**	**252**	**$1,410**	**7409**	29.4	**18.2**	92.0
	Phobos FC + Priaxor	7.6 fl oz + 8 fl oz	B,D							
26	EBDC**	2 lb	A, C, E	6.5	**249**	$1,374	7141	28.6	17.5	**93.3**
	EBDC** + Curezin + Salia	2 lb + 2 pt + 4 fl oz	B, D							
12	EBDC**	2 lb	A, C, E	6.8	248	**$1,408**	**7421**	**30.0**	17.6	**92.8**
	Propulse	13.6 fl oz	B, D							
17	EBDC**	2 lb	A, C, E	6.8	244	**$1,513**	**7985**	**32.7**	17.8	91.7
	Priaxor + Topsin	8 fl oz + 20 fl oz	B, D							
24	EBDC**	2 lb	A, C, E	7.0	246	$1,368	**7263**	29.5	**18.1**	91.4
	Phobos FC + Headline	7.6 fl oz + 12 fl oz	B, D							
9	EBDC**	2 lb	A, C, E	7.1	**254**	**$1,518**	**7778**	**30.6**	**18.0**	**92.9**
	Super Tin	8 fl oz	B, D							
20	EBDC**	2 lb	A, C, E	7.1	**252**	**$1,494**	**7827**	**31.1**	17.8	**92.9**
	Delaro + Luna Privilege + Proline	11 fl oz + 2 fl oz + 1.7 fl oz	B, D							
2	EBDC**	2 lb	A, C, E	7.1	**253**	**$1,450**	**7458**	29.4	**18.2**	92.1
	Inspire XT	7 fl oz	B, D							
10	EBDC**	2 lb	A, C, E	7.3	**251**	**$1,531**	**7893**	**31.3**	**18.3**	91.6
	Super Tin + Topsin 4.5 FL	8 fl oz + 20 fl oz	B, D							
11	EBDC**	2 lb	A, C, E	7.4	244	$1,299	6830	27.9	**18.0**	91.1
	Minerva Duo	16 fl oz	B, D							

***All treatments included MasterLock @ 6.4 fl oz**

****EBDC = Manzate Pro-Stick, Copper = Badge**

***** Cercospora Rate (0-9 Scale): 0 = no spots, 1 = Very few spots, 5 = up to 25% injury and 9 = leaves completely dead.**

$/A: Payment calculated using early delivery adjustment where necessary, and the new quality payment minus fungicide and application cost.
Bold: Results are not statistically different from top-ranking treatment in each column.

Cercospora Fungicide Efficacy

Gilford - Fairgrove, MI - 2024

No.	Treatment*	Rate/A	Applic Timing	CLS*** Rate 8-Oct	RWST	Net $/A	RWSA	T/A	% SUC	% CJP
22	EBDC**	2 lb	A, C, E	7.5	247	**$1,403**	**7426**	**30.0**	**18.1**	91.6
	Luna Flex + Propulse	13.6 fl oz + 13.6 fl oz	B, D							
21	EBDC**	2 lb	A, C, E	7.6	**255**	**$1,506**	**7725**	**30.4**	**18.3**	92.3
	Luna Flex	13.6 fl oz	B, D							
4	EBDC**	2 lb	A, C, E	7.6	**250**	$1,397	**7301**	29.1	**18.1**	92.0
	Topguard EQ	14 fl oz	B, D							
15	EBDC**	2 lb	A, C, E	7.6	243	$1,372	**7271**	29.9	**18.0**	91.1
	Revytek	15 fl oz	B, D							
8	EBDC**	2 lb	A, C, E	7.6	247	$1,365	7155	28.9	**18.3**	91.0
	Priaxor	8 fl oz	B, D							
18	EBDC**	2 lb	A, C, E	7.8	**253**	**$1,429**	**7413**	29.3	**18.0**	**92.7**
	Veltyma	10 fl oz	B, D							
14	EBDC**	2 lb	A, C, E	7.8	**249**	$1,361	7089	28.5	17.8	**92.5**
	Lucento	5.5 fl oz	B, D							
7	EBDC**	2 lb	A, C, E	7.8	245	**$1,444**	**7572**	**30.9**	17.8	91.9
	Provysol	5 fl oz	B, D							
13	EBDC**	2 lb	A, C, E	7.9	**255**	**$1,422**	**7329**	28.7	**18.0**	**93.0**
	Delaro + Proline	11 fl oz + 1.6 fl oz	B, D							
3	EBDC**	2 lb	A, C, E	7.9	**250**	**$1,569**	**8117**	**32.3**	**18.0**	92.2
	Proline	5.7 fl oz	B, D							
23	EBDC**	2 lb	A, C, E	7.9	245	$1,362	7184	29.4	17.7	92.0
	Phobos FC	7.6 fl oz	B, D							
29	EBDC**	2 lb	A, C, E	8.1	241	**$1,510**	**8019**	**33.3**	17.4	92.3
	Vacciplant + Provysol	16 fl oz + 5 fl oz	B, D							
5	EBDC**	2 lb	A, C, E	8.3	247	$1,353	7059	28.6	**17.9**	91.8
	Enable	8 fl oz	B, D							
6	EBDC** Minerva	2 lb 13 fl oz	A, C, E B, D	8.3	240	$1,351	7161	29.9	17.6	91.3
1	Untreated			9.0	232	$1,267	6710	29.0	16.9	91.9
Average				7.3	249	$1,435	7478	30.0	18.0	92.1
LSD 5%				1.1	15.4	198.5	883.7	3.1	0.7	1.6
CV %				11.1	4.4	9.8	8.4	7.3	3.0	1.2

***All treatments included MasterLock @ 6.4 fl oz**

****EBDC = Manzate Pro-Stick, Copper = Badge**

*****Cercospora Rate (0-9 Scale): 0 = no spots, 1 = Very few spots, 5 = up to 25% injury and 9 = leaves completely dead.**

Comments: Study was designed to test products for Cercospora leafspot efficacy. Heavy Cercospora and Alternaria leafspot were observed in this trial.

$/A: Payment calculated using early delivery adjustment where necessary, and the new quality payment minus fungicide and application cost.

Bold: Results are not statistically different from top-ranking treatment in each column.

Cercospora Fungicide Efficacy

Answer Plot, Bach & Gilford, Fairgrove - 2024

No.	Treatment*	Application Timing	Answer Plot Date	Gilford Date
1	Untreated Check			
2	EBDC**	A, C, & E	7/9, 8/14, 9/13	6/27, 8/2, 9/11
	Inspire XT	B & D	7/23, 8/27	7/12, 8/15
3	EBDC**	A, C, & E	7/9, 8/14, 9/13	6/27, 8/2, 9/11
	Proline	B & D	7/23, 8/27	7/12, 8/15
4	EBDC**	A, C, & E	7/9, 8/14, 9/13	6/27, 8/2, 9/11
	Topguard EQ	B & D	7/23, 8/27	7/12, 8/15
5	EBDC**	A, C, & E	7/9, 8/14, 9/13	6/27, 8/2, 9/11
	Enable	B & D	7/23, 8/27	7/12, 8/15
6	EBDC**	A, C, & E	7/9, 8/14, 9/13	6/27, 8/2, 9/11
	Minerva	B & D	7/23, 8/27	7/12, 8/15
7	EBDC**	A, C, & E	7/9, 8/14, 9/13	6/27, 8/2, 9/11
	Provysol	B & D	7/23, 8/27	7/12, 8/15
8	EBDC**	A, C, & E	7/9, 8/14, 9/13	6/27, 8/2, 9/11
	Priaxor	B & D	7/23, 8/27	7/12, 8/15
9	EBDC**	A, C, & E	7/9, 8/14, 9/13	6/27, 8/2, 9/11
	Super Tin	B & D	7/23, 8/27	7/12, 8/15
10	EBDC**	A, C, & E	7/9, 8/14, 9/13	6/27, 8/2, 9/11
	Super Tin + Topsin 4.5 FL	B & D	7/23, 8/27	7/12, 8/15
11	EBDC**	A, C, & E	7/9, 8/14, 9/13	6/27, 8/2, 9/11
	Minerva Duo	B & D	7/23, 8/27	7/12, 8/15
12	EBDC**	A, C, & E	7/9, 8/14, 9/13	6/27, 8/2, 9/11
	Propulse	B & D	7/23, 8/27	7/12, 8/15
13	EBDC**	A, C, & E	7/9, 8/14, 9/13	6/27, 8/2, 9/11
	Delaro + Proline	B & D	7/23, 8/27	7/12, 8/15
14	EBDC**	A, C, & E	7/9, 8/14, 9/13	6/27, 8/2, 9/11
	Lucento	B & D	7/23, 8/27	7/12, 8/15
15	EBDC**	A, C, & E	7/9, 8/14, 9/13	6/27, 8/2, 9/11
	Revytek	B & D	7/23, 8/27	7/12, 8/15
16	EBDC**	A, C, & E	7/9, 8/14, 9/13	6/27, 8/2, 9/11
	Copper	B & D	7/23, 8/27	7/12, 8/15
17	EBDC**	A, C, & E	7/9, 8/14, 9/13	6/27, 8/2, 9/11
	Priaxor + Topsin 4.5 FL	B & D	7/23, 8/27	7/12, 8/15
18	EBDC**	A, C, & E	7/9, 8/14, 9/13	6/27, 8/2, 9/11
	Veltyma	B & D	7/23, 8/27	7/12, 8/15
19	EBDC**	A-E	7/9, 7/23, 8/14, 8/27, 9/13	6/27, 7/12, 8/2, 8/15, 9/11
20	EBDC**	A, C, & E	7/9, 8/14, 9/13	6/27, 8/2, 9/11
	Delaro + Luna Privilege + Proline	B & D	7/23, 8/27	7/12, 8/15

***All treatments included MasterLock @ 6.4 fl oz**

****EBDC = Manzate Pro-Stick , Copper = Badge**

Cercospora Fungicide Efficacy

Answer Plot, Bach & Gilford, Fairgrove - 2024

No.	Treatment*	Application Timing	Answer Plot Date	Gilford Date
21	EBDC**	A, C, & E	7/9, 8/14, 9/13	6/27, 8/2, 9/11
	Luna Flex	B & D	7/23, 8/27	7/12, 8/15
22	EBDC**	A, C, & E	7/9, 8/14, 9/13	6/27, 8/2, 9/11
	Luna Flex + Propulse	B & D	7/23, 8/27	7/12, 8/15
23	EBDC**	A, C, & E	7/9, 8/14, 9/13	6/27, 8/2, 9/11
	Phobos FC	B & D	7/23, 8/27	7/12, 8/15
24	EBDC**	A, C, & E	7/9, 8/14, 9/13	6/27, 8/2, 9/11
	Phobos FC + Headline	B & D	7/23, 8/27	7/12, 8/15
25	EBDC**	A, C, & E		6/27, 8/2, 9/11
	Phobos FC + Priaxor	B & D		7/12, 8/15
26	EBDC**	A, C, & E		6/27, 8/2, 9/11
	EBDC** + Curezin + Salia	B & D		7/12, 8/15
27	EBDC**	A, C, & E		6/27, 8/2, 9/11
	EBDC** + Curezin + Salia	B & D		7/12, 8/15
28	EBDC**	A, C, & E		6/27, 8/2, 9/11
	EBDC** + Copper**	B & D		7/12, 8/15
29	EBDC**	A, C, & E		6/27, 8/2, 9/11
	Vacciplant + Provysol	B & D		7/12, 8/15

***All treatments included MasterLock @ 6.4 fl oz**

****EBDC = Manzate Pro-Stick, Copper = Badge**

Cercospora Leafspot Programs Standard

Answer Plot, Bach - 2023

Trial Quality: Good
Variety: SX-2296
Planted: May 16
Harvested: October 2
Plots: 6 rows X 38 ft, 4 reps
Row Spacing: 22 in.

Soil Info: Clay Loam
% OM: 3 **pH:** 7.6 **CEC:** 15.1
P: Very High **K:** Very High
Mn: High **B:** High
Added N: 36 lbs. 2X2 + 100 lbs. sidedress
Previous Crop: Corn

Rhizoc Level: Low
Problems: None
Seeding Rate: 4.1 in.
Rainfall: 10.69 in.
Beets/100 ft: 199

Application: JD 3520 tractor mounted plot sprayer, compressed air, 100 psi, 25 gpa

No.	Treatment**	Rate/A	Applic Timing ***	CLS**** Rate 0-9 19-Sep	RWST	Net $/A	RWSA	T/A	% SUC	% CJP
18	EBDC*	2 lb	A	**2.8**	**304**	**$1,527**	**7116**	23.4	**20.5**	94.8
	EBDC* + Delaro + Proline	2 lb + 11 floz + 1.6 fl oz	B							
	EBDC* + Super Tin + Topsin	2 lb + 8 fl oz + 20 fl oz	C							
	EBDC* + Inspire XT	2 lb + 7 fl oz	D							
	EBDC* + Super Tin	2 lb + 8 fl oz	E							
	EBDC*	2 lb	F							
15	EBDC*	2 lb	A	**2.9**	**306**	**$1,538**	**7239**	**23.6**	**20.2**	**95.8**
	EBDC* + Provysol + Microthiol Disperse	2 lb + 5 fl oz + 10 lb	B							
	EBDC* + Super Tin + Microthiol Dispers	2 lb + 8 fl oz + 10 lb	C							
	EBDC* + Priaxor + Topsin	2 lb + 8 fl oz + 20 fl oz	D							
	EBDC* + Proline + Microthiol Disperse	2 lb + 5.7 fl oz + 10 lb	E							
	EBDC*	2 lb	F							
22	EBDC*	2 lb	A	**2.9**	283	$1,446	6907	**24.4**	19.1	94.7
	EBDC* + GF-4536	2 lb + 20.5 fl oz	B							
	EBDC* + Super Tin + Topsin	2 lb + 8 fl oz + 20 fl oz	C							
	EBDC* + Provysol	2 lb + 5 fl oz	D							
	EBDC* + Super Tin	2 lb + 8 fl oz	E							
	EBDC*	2 lb	F							
14	EBDC*	2 lb	A	**2.9**	**300**	**$1,514**	**7107**	**23.7**	**20.0**	**95.4**
	EBDC* + Delaro + Proline + Microthiol Disperse	2 lb + 11 f l oz + 1.6 fl oz + 10 lb	B							
	EBDC* + Super Tin + Topsin + Microthiol Disperse	2 lb + 8 fl oz + 20 fl oz + 10 lb	C							
	EBDC* + Provysol	2 lb + 5 fl oz	D							
	EBDC* + Super Tin + Microthiol Disperse	2 lb + 8 fl oz + 10 lb	E							
	EBDC*	2 lb	F							
2	EBDC*	2 lb	A	**2.9**	**303**	**$1,563**	**7302**	**24.1**	**20.2**	**95.2**
	EBDC* + Delaro + Proline	2 lb + 11 fl oz + 1.6 fl oz	B							
	EBDC* + Super Tin + Topsin	2 lb + 8 fl oz + 20 fl oz	C							
	EBDC* + Proyvsol	2 lb + 5 fl oz	D							
	EBDC* + Super Tin	2 lb + 8 fl oz	E							
	EBDC*	2 lb	F							

***EBDC = Manzate Pro-stick / Copper = Badge**

****All treatments included MasterLock @ 6.4 fl oz**

*****Application dates for all treatments: A-7/9, B-7/20, C-8/1, D-8/12, E-8/30, F-9/10**

******Cercospora Rating (0-9 Scale): 0 = no spots, 1 = very few spots, 5 = up to 25% injury, and 9 = leaves completely dead.**

$/A: Payment calculated using early delivery adjustment where necessary, and the new quality payment minus fungicide and application cost.

Bold: Results are not statistically different from top-ranking treatment in each column.

Cercospora Leafspot Programs Standard

Answer Plot, Bach - 2024

No.	Treatment**	Rate/A	Applic Timing ***	CLS**** Rate 0-9 19-Sep	RWST	Net $/A	RWSA	T/A	% SUC	% CJP
5	EBDC*	2 lb	A	**3.0**	**302**	**$1,495**	6993	23.2	**20.4**	94.6
	EBDC* + Provysol	2 lb + 5 fl oz	B							
	EBDC + Super Tin + Topsin	2 lb + 8 fl oz + 20 fl oz	C							
	EBDC* + Proline	2 lb + 5.7 fl oz	D							
	EBDC* + Super Tin	2 lb + 8 fl oz	E							
	EBDC*	2 lb	F							
20	EBDC*	2 lb	A	**3.1**	**314**	**$1,570**	**7203**	22.9	**20.7**	**96.0**
	EBDC* + Proline	2 lb + 5.7 fl oz	B							
	EBDC* + Super Tin + Topsin	2 lb + 8 fl oz + 20 fl oz	C							
	EBDC* + Inspire XT	2 lb + 7 fl oz	D							
	EBDC* + Super Tin	2 lb + 8 fl oz	E							
	EBDC*	2 lb	F							
4	EBDC*	2 lb	A	**3.1**	298	**$1,495**	**7048**	**23.6**	19.5	**96.5**
	EBDC* + Provysol	2 lb + 5 fl oz	B							
	EBDC* + Super Tin	2 lb + 8 fl oz	C							
	EBDC* + Priaxor + Topsin	2 lb + 8 fl oz + 20 fl oz	D							
	EBDC* + Proline	2 lb + 5.7 fl oz	E							
	EBDC*	2 lb	F							
16	EBDC*	2 lb	A	**3.1**	285	$1,291	6231	21.8	19.3	94.7
	EBDC* + Topguard + Microthiol Disperse	2 lb + 14 fl oz + 10 lb	B							
	EBDC* + Super Tin + Topsin + Microthiol Disperse	2 lb + 8 fl oz + 20 fl oz + 10 lb	C							
	EBDC* + Enable	2 lb + 8 fl oz	D							
	EBDC* + Super Tin + Microthiol Disperse	2 lb + 8 fl oz + 10 lb	E							
	EBDC*	2 lb	F							
11	EBDC*	2 lb	A	**3.2**	**310**	**$1,576**	**7255**	23.4	**20.7**	**95.3**
	EBDC* + Copper*	2 lb + 2 pt	B							
	EBDC* + Copper*	2 lb + 2 pt	C							
	EBDC* + Copper*	2 lb + 2 pt	D							
	EBDC* + Copper*	2 lb + 2 pt	E							
	EBDC*	2 lb	F							
6	EBDC*	2 lb	A	**3.2**	**309**	**$1,664**	**7715**	**25.0**	**20.6**	**95.1**
	EBDC* + Topguard	2 lb + 14 fl oz	B							
	EBDC* + Super Tin + Topsin	2 lb + 8 fl oz + 20 fl oz	C							
	EBDC* + Enable	2 lb + 8 fl oz	D							
	EBDC* + Super Tin	2 lb + 8 fl oz	E							
	EBDC*	2 lb	F							

***EBDC = Manzate Pro-stick / Copper = Badge**

****All treatments included MasterLock @ 6.4 fl oz**

*****Application dates for all treatments: A-7/9, B-7/20, C-8/1, D-8/12, E-8/30, F-9/10**

******Cercospora Rating (0-9 Scale): 0 = no spots, 1 = very few spots, 5 = up to 25% injury, and 9 = leaves completely dead.**

$/A: Payment calculated using early delivery adjustment where necessary, and the new quality payment minus fungicide and application cost.

Bold: Results are not statistically different from top-ranking treatment in each column.

Cercospora Leafspot Programs Standard

Answer Plot, Bach - 2024

No.	Treatment**	Rate/A	Applic Timing ***	CLS**** Rate 0-9 19-Sep	RWST	Net $/A	RWSA	T/A	% SUC	% CJP
19	EBDC*	2 lb	A	**3.3**	**308**	$1,443	6691	21.7	**20.5**	**95.5**
	EBDC* + Revytek	2 lb + 15 fl oz	B							
	EBDC* + Super Tin + Topsin	2 lb + 8 fl oz + 20 fl oz	C							
	EBDC* + Inspire XT	2 lb + 7 fl oz	D							
	EBDC* + Super Tin	2 lb + 8 fl oz	E							
	EBDC*	2 lb	F							
13	EBDC*	2 lb	A	**3.3**	286	$1,391	6632	23.2	18.9	**96.0**
	EBDC* + Provysol	2 lb + 5 fl oz	B							
	EBDC* + Super Tin	2 lb + 8 fl oz	C							
	EBDC* + Proline	2 lb + 5.7 fl oz	D							
	EBDC* + Super Tin	2 lb + 8 fl oz	E							
	EBDC*	2 lb	F							
12	EBDC*	2 lb	A	**3.3**	**303**	**$1,522**	**7185**	**23.8**	**20.4**	94.8
	EBDC* + Delaro + Proline + N. Demand + Boron 10%	2 lb + 11 fl oz + 1.6 fl oz + 1 gal + 1 qt	B							
	EBDC* + Super Tin + Topsin	2 lb + 8 fl oz + 20 fl oz	C							
	EBDC* + Provysol + N. Demand + Boron 10%	2 lb + 5 fl oz + 1 gal + 1 qt	D							
	EBDC* + Super Tin	2 lb + 8 fl oz	E							
	EBDC* + Inspire XT + N. Demand + Boron 10%	2 lb + 7 fl oz + 1 gal + 1 qt	F							
9	EBDC* + Topguard	2 lb + 14 fl oz	B	**3.3**	**304**	**$1,700**	**7908**	**26.0**	**20.4**	94.9
	EBDC* + Super Tin + Topsin	2 lb + 8 fl oz + 20 fl oz	C							
	EBDC* + Enable	2 lb + 8 fl oz	D							
	EBDC* + Super Tin	2 lb + 8 fl oz	E							
	EBDC*	2 lb	F							
3	EBDC*	2 lb	A	**3.3**	296	**$1,511**	**7103**	**24.0**	19.7	**95.7**
	EBDC* + Inspire XT	2 lb + 7 fl oz	B							
	EBDC* + Super Tin + Topsin	2 lb + 8 fl oz + 20 fl oz	C							
	EBDC* + Provysol	2 lb + 5 fl oz	D							
	EBDC* + Super Tin	2 lb + 8 fl oz	E							
	EBDC*	2 lb	F							
8	EBDC*	2 lb	A	3.4	297	$1,309	6217	20.9	**20.0**	95.0
	EBDC* + Provysol	2 lb + 5 fl oz	B							
	EBDC* + Priaxor + Topsin	2 lb + 8 fl oz + 20 fl oz	C							
	EBDC* + Inspire XT	2 lb + 7 fl oz	D							
	EBDC* + Flint Xtra	2 lb + 3.6 fl oz	E							
	EBDC*	2 lb	F							

***EBDC = Manzate Pro-stick / Copper = Badge**

****All treatments included MasterLock @ 6.4 fl oz**

*****Application dates for all treatments: A-7/9, B-7/20, C-8/1, D-8/12, E-8/30, F-9/10**

******Cercospora Rating (0-9 Scale): 0 = no spots, 1 = very few spots, 5 = up to 25% injury, and 9 = leaves completely dead.**

$/A: Payment calculated using early delivery adjustment where necessary, and the new quality payment minus fungicide and application cost.

Bold: Results are not statistically different from top-ranking treatment in each column.

Cercospora Leafspot Programs Standard

Answer Plot, Bach - 2024

No.	Treatment**	Rate/A	Applic Timing ***	CLS**** Rate 0-9 19-Sep	RWST	Net $/A	RWSA	T/A	% SUC	% CJP
17	EBDC*	2 lb	A	3.5	**305**	**$1,583**	**7348**	**24.1**	**20.3**	**95.4**
	EBDC* + Revytek	2 lb + 15 fl oz	B							
	EBDC* + Super Tin + Topsin	2 lb + 8 fl oz + 20 fl oz	C							
	EBDC* + Inspire XT	2 lb + 7 fl oz	D							
	EBDC* + Super Tin	2 lb + 8 fl oz	E							
	EBDC*	2 lb	F							
10	EBDC* + Delaro + Proline	2 lb + 11 fl oz + 1.6 fl oz	A	3.5	**305**	**$1,516**	**7101**	23.2	**20.4**	**95.1**
	EBDC* + Super Tin	2 lb + 8 fl oz	B							
	EBDC* + Priaxor + Topsin	2 lb + 8 fl oz + 20 fl oz	C							
	EBDC* + Provysol	2 lb + 8 fl oz	D							
	EBDC* + Super Tin	2 lb + 8 fl oz	E							
	EBDC*	2 lb	F							
7	EBDC*	2 lb	A	3.6	**301**	**$1,544**	**7257**	**24.1**	**20.3**	94.7
	EBDC* + Provysol	2 lb + 8 fl oz	B							
	EBDC* + Priaxor + Topsin	2 lb + 8 fl oz + 20 fl oz	C							
	EBDC* + Inspire XT	2 lb + 8 fl oz	D							
	EBDC* + Copper*	2 lb + 2 pt	E							
	EBDC*	2 lb	F							
21	EBDC*	2 lb	A	3.6	**305**	$1,491	6892	22.6	**20.5**	94.8
	EBDC* + Growthful Foliar	2 lb + 12.8 fl oz	B							
	EBDC* + Growthful Foliar	2 lb + 12.8 fl oz	C							
	EBDC* + Growthful Foliar	2 lb + 12.8 fl oz	D							
	EBDC* + Growthful Foliar	2 lb + 12.8 fl oz	E							
	EBDC*	2 lb	F							
1	Untreated Check			6.4	277	$1,078	5056	18.2	18.7	95.0
	Average			3.3	300	$1,489	6978	23.2	20.1	95.2
	LSD 5%			0.5	15.0	205.3	859.5	2.4	0.9	1.4
	CV%			10.7	3.5	9.8	8.7	7.3	3.2	1.0

***EBDC = Manzate Pro-stick / Copper = Badge**

****All treatments included MasterLock @ 6.4 fl oz**

*****Application dates for all treatments: A-7/9, B-7/20, C-8/1, D-8/12, E-8/30, F-9/10**

******Cercospora Rating (0-9 Scale): 0 = no spots, 1 = very few spots, 5 = up to 25% injury, and 9 = leaves completely dead.**

Comments: This study was designed to compare fungicide programs in conventional or less tolerant Cercospora leafspot varieties. Strong Alternaria and Cercospora leafspot pressure in this study.

$/A: Payment calculated using early delivery adjustment where necessary, and the new quality payment minus fungicide and application cost.

Bold: Results are not statistically different from top-ranking treatment in each column.

Cercospora Programs CR+

Answer Plot, Bach - 2024

Trial Quality: Good
Variety: C-G233
Planted: May 16
Harvested: October 2
Plots: 6 rows X 38 ft., 4 reps
Row Spacing: 22 in.

Soil Info: Clay Loam
% OM: 3 **pH:** 7.6 **CEC:** 15.1
P: Very High **K:** Very High
Mn: High **B:** High
Added N: 36 lbs. 2X2 + 100 lbs. sidedress
Previous Crop: Corn

Rhizoc Level: Low
Problems: None
Seeding Rate: 4.1 in.
Rainfall: 10.69 in.
Beets/100 ft: 203

Application: JD 3520 tractor mounted plot sprayer, compressed air, 100 psi, 25 gpa

No.	Treatment**	Rate/A	Applic Timing ***	CLS**** Rate 30-Sep	RWST	Net $/A	RWSA	T/A	% SUC	% CJP
15	EBDC* + Copper*	2 lb + 2 pt	A-E	**4.0**	**284**	**$1,609**	**7666**	**27.0**	**19.6**	**94.1**
	EBDC*	2 lb	F							
17	EBDC* + Copper*	2 lb + 2 pt	B-E	**4.4**	**301**	**$1,514**	**7030**	23.3	**20.7**	**93.9**
	EBDC*	2 lb	F							
14	EBDC*	2 lb	A-F	5.0	**289**	**$1,470**	**6901**	23.8	**20.6**	92.3
19	EBDC* + Copper*	2 lb + 2 pt	A B D	5.4	**297**	**$1,687**	**7834**	**26.4**	**20.5**	**93.5**
	EBDC*	2 lb	F							
16	EBDC*	2 lb	B-F	5.4	**283**	**$1,575**	**7437**	**26.3**	**19.9**	92.9
8	EBDC*	2 lb	A	5.4	278	**$1,614**	**7701**	**27.7**	**19.7**	92.7
	EBDC* + Super Tin + Topsin	2 lb + 8 fl oz + 20 fl oz	B							
	EBDC* + Delaro + Proline	2 lb + 11 fl oz + 1.6 fl oz	D							
	EBDC*	2 lb	F							
30	EBDC* + Curezin XT + Salia	2 lb + 1.5 pt + 3 fl oz	A-E	5.5	**291**	**$1,522**	**7173**	**24.6**	19.3	**95.6**
	EBDC*	2 lb	F							
3	EBDC* + Delaro + Proline	2 lb + 11 fl oz + 1.6 fl oz	B	5.6	**290**	**$1,640**	**7706**	**26.6**	**20.0**	**93.7**
	EBDC* + Super Tin + Topsin	2 lb + 8 fl oz + 20 fl oz	D							
	EBDC* + Provysol	2 lb + 5 fl oz	F							
4	EBDC*	2 lb	A	5.8	**291**	**$1,628**	**7614**	**26.1**	**20.2**	**93.6**
	EBDC* + Minerva	2 lb + 13 fl oz	B							
	EBDC* + Super Tin + Topsin	2 lb + 8 fl oz + 20 fl oz	D							
	EBDC*	2 lb	F							
10	EBDC*	2 lb	A	5.9	**300**	**$1,690**	**7813**	**26.1**	**20.1**	**95.0**
	EBDC* + Delaro + Proline	2 lb +11 fl oz + 1.6 fl oz	C							
	EBDC* + Super Tin + Topsin	2 lb + 8 fl oz + 20 fl oz	E							
27	EBDC*	2 lb	A	6.0	**295**	**$1,445**	**6753**	22.9	**19.8**	**95.2**
	EBDC* + Delaro + Proline	2 lb + 11 fl oz + 1.6 fl oz	B							
	EBDC* + Super Tin + Topsin	2 lb + 8 fl oz + 20 fl oz	D							
	EBDC*	2 lb	F							

***EBDC = Manzate Pro-Stick / Copper = Badge**

****All treatments included MasterLock @ 6.4 fl oz. Except Trt 29 & 30.**

*****Application dates for all treatments: A-7/8, B-7/18, C-8/1, D-8/14, E-9/3 & F-9/13**

******Cercospora Rating (0-9 Scale): 0 = no spots, 1 = Very few spots, 5 = up to 25% injury and 9 = leaves completely dead**

$/A: Payment calculated using early delivery adjustment where necessary, and the new quality payment minus fungicide and application cost.

Bold: Results are not statistically different from top-ranking treatment in each column.

Cercospora Programs CR+

Answer Plot, Bach - 2024

No.	Treatment**	Rate/A	Applic Timing ***	CLS**** Rate 30-Sep	RWST	Net $/A	RWSA	T/A	% SUC	% CJP
24	EBDC*	2 lb	A	6.0	278	**$1,463**	**6961**	**24.9**	**19.7**	92.7
	EBDC* + Revytek	2 lb + 15 fl oz	B							
	EBDC* + Super Tin + Topsin	2 lb + 8 fl oz + 20 fl oz	D							
	EBDC*	2 lb	F							
21	EBDC* + Copper*	2 lb + 2 pt	B D	6.0	**286**	**$1,516**	**7111**	**24.8**	**20.0**	**93.3**
	EBDC*	2 lb	F							
11	EBDC* + Delaro + Proline	2 lb + 11 fl oz + 1.6 fl oz	C	6.0	**286**	**$1,487**	**6986**	24.4	**19.8**	**93.6**
	EBDC* + Super Tin + Topsin	2 lb + 8 fl oz + 20 fl oz	E							
22	EBDC*	2 lb	A	6.1	**305**	**$1,653**	**7598**	**24.9**	**20.2**	**95.8**
	EBDC* + Revytek	2 lb + 15 fl oz	B							
	EBDC* + Super Tin + Topsin	2 lb + 8 fl oz + 20 fl oz	D							
	EBDC*	2 lb	F							
13	EBDC* + Minerva	2 lb + 13 fl oz	C	6.1	**286**	$1,385	6500	22.7	**19.8**	**93.7**
	EBDC* + Super Tin + Topsin	2 lb + 8 fl oz + 20 fl oz	E							
9	EBDC* + Super Tin + Topsin	2 lb + 8 fl oz + 20 fl oz	B	6.1	**289**	**$1,562**	**7314**	**25.2**	**20.1**	**93.3**
	EBDC* + Delaro + Proline	2 lb + 11 fl oz + 1.6 fl oz	D							
	EBDC*	2 lb	F							
26	EBDC*	2 lb	A	6.3	**289**	**$1,656**	**7763**	**26.8**	**20.0**	**93.6**
	EBDC* + Revytek	2 lb + 15 fl oz	B							
	EBDC* + Super Tin + Topsin	2 lb + 8 fl oz + 20 fl oz	D							
	EBDC*	2 lb	F							
25	EBDC*	2 lb	A	6.3	273	$1,403	**6747**	**24.6**	19.2	**93.2**
	EBDC* + Proline	2 lb + 5.7 fl oz	B							
	EBDC* + Super Tin + Topsin	2 lb + 8 fl oz + 20 fl oz	D							
	EBDC*	2 lb	F							
23	EBDC*	2 lb	A	6.3	**282**	**$1,444**	**6870**	24.4	19.3	**94.3**
	EBDC* + Delaro + Proline	2 lb + 11 fl oz + 1.6 fl oz	B							
	EBDC* + Super Tin + Topsin	2 lb + 8 fl oz + 20 fl oz	D							
	EBDC*	2 lb	F							
20	EBDC*	2 lb	B D F	6.3	273	**$1,458**	**6946**	**25.4**	19.1	**93.4**
12	EBDC*	2 lb	A	6.3	274	$1,375	6585	24.0	19.0	**93.8**
	EBDC* + Minerva	2 lb + 13 fl oz	C							
	EBDC* + Super Tin + Topsin	2 lb + 8 fl oz + 20 fl oz	E							

***EBDC = Manzate Pro-Stick / Copper = Badge**

****All treatments included MasterLock @ 6.4 fl oz. Except Trt 29 & 30.**

*****Application dates for all treatments: A-7/8, B-7/18, C-8/1, D-8/14, E-9/3 & F-9/13**

******Cercospora Rating (0-9 Scale): 0 = no spots, 1 = Very few spots, 5 = up to 25% injury and 9 = leaves completely dead**

$/A: Payment calculated using early delivery adjustment where necessary, and the new quality payment minus fungicide and application cost.

Bold: Results are not statistically different from top-ranking treatment in each column.

Cercospora Programs CR+

Answer Plot, Bach - 2024

No.	Treatment**	Rate/A	Applic Timing***	CLS**** Rate 30-Sep	RWST	Net $/A	RWSA	T/A	% SUC	% CJP
7	EBDC* + Provysol	2 lb + 5 fl oz	B	6.3	280	**$1,479**	**7041**	**25.0**	**19.5**	**93.6**
	EBDC* + Priaxor + Topsin	2 lb + 8 fl oz + 20 fl oz	D							
	EBDC*	2 lb	F							
6	EBDC*	2 lb	A	6.3	279	**$1,542**	**7387**	**26.5**	19.2	**94.1**
	EBDC* + Provysol	2 lb + 5 fl oz	B							
	EBDC* + Priaxor + Topsin	2 lb + 8 fl oz + 20 fl oz	D							
	EBDC* + Super Tin	2 lb + 8 fl oz	F							
28	EBDC*	2 lb	A	6.4	279	**$1,423**	**6792**	24.3	19.1	**94.4**
	EBDC* + Veltyma	2 lb + 10 fl oz	B							
	EBDC* + Super Tin + Topsin	2 lb + 8 fl oz + 20 fl oz	D							
	EBDC*	2 lb	F							
5	EBDC* + Minerva	2 lb + 13 fl oz	B	6.4	**283**	**$1,542**	**7279**	**25.7**	**19.5**	**93.7**
	EBDC* + Super Tin + Topsin	2 lb + 8 fl oz + 20 fl oz	D							
	EBDC*	2 lb	F							
18	EBDC*	2 lb	A B D F	6.5	270	$1,335	6420	23.8	18.7	**93.9**
2	EBDC*	2 lb	A	6.5	**297**	**$1,570**	**7301**	24.5	**20.1**	**94.6**
	EBDC* + Delaro + Proline	2 lb + 11 fl oz + 1.6 fl oz	B							
	EBDC* + Super Tin + Topsin	2 lb + 8 fl oz + 20 fl oz	D							
	EBDC*	2 lb	F							
29	Curezin XT + Salia	1.5 pt + 3 fl oz	A	6.6	**283**	**$1,473**	**6991**	**24.7**	19.2	**94.6**
	Curezin XT + Delaro + Proline + Salia	1.5 pt + 11 fl oz + 1.6 fl oz + 3 fl oz	B							
	Curezin + Super Tin + Topsin + Salia	1.5 pt + 8 fl oz + 20 fl oz + 3 fl oz	D							
	EBDC*	2 lb	F							
1	Untreated Check			9.0	259	$1,195	5776	22.3	18.4	92.6
	Average			6.0	285	$1,512	7133	25.0	19.7	93.8
	LSD 5%			0.8	22.7	284.9	1166.8	3.1	1.3	2.7
	CV%			10.0	5.7	13.4	11.6	8.7	4.8	2.0

***EBDC = Manzate Pro-Stick / Copper = Badge**

****All treatments included MasterLock @ 6.4 fl oz. Except Trt 29 & 30.**

*****Application dates for all treatments: A-7/8, B-7/18, C-8/1, D-8/14, E-9/3 & F-9/13**

******Cercospora Rating (0-9 Scale): 0 = no spots, 1 = Very few spots, 5 = up to 25% injury and 9 = leaves completely dead**

Comments: This study was designed to examine fungicide programs with a CR+ variety. Alternaria and Cercospora leafspot were present at high levels.

$/A: Payment calculated using early delivery adjustment where necessary, and the new quality payment minus fungicide and application cost.

Bold: Results are not statistically different from top-ranking treatment in each column.

Cercospora Programs Ontario CR+
Answer Plot - Pigeon, MI - 2024

Trial Quality: Good
Variety: C-G233
Planted: May 16
Harvested: October 1
Plots: 6 rows X 38 ft., 4 reps
Row Spacing: 22 in.

Soil Info: Clay Loam
% OM: 3 **pH:** 7.6 **CEC:** 15.1
P: Very High **K:** Very High
Mn: High **B:** High
Added N: 36 lbs. 2X2 + 100 lbs. sidedress
Previous Crop: Corn

Rhizoc Level: Low
Problems: None
Seeding Rate: 4.1 in.
Rainfall: 10.69 in.
Beets/100 ft: 196

Application: JD 3520 tractor mounted plot sprayer, compressed air, 100 psi, 25 gpa

No.	Treatment*	Rate/A	Applic Date **	CLS*** Rate 30-Sep	RWST	Net $/A	RWSA	T/A	% SUC	% CJP
9	Penncozeb + ChampION	2 lb + 2 lb	B D F G	**3.5**	**293**	**$1,417**	**6582**	22.4	**19.7**	95.1
8	Penncozeb	2 lb	A	**3.8**	**280**	**$1,266**	**5996**	21.2	**18.8**	95.3
	Penncozeb + Cevya	2 lb + 5 fl oz	C							
	Penncozeb + ChampION	2 lb + 2 lb	E							
	Penncozeb + Proline	2 lb + 5.7 fl oz	H							
7	Penncozeb + ChampION + Cevya	2 lb + 2 lb + 5 fl oz	B	5.8	264	$1,183	**5757**	21.9	18.0	95.0
	Penncozeb + Priaxor + Topsin	2 lb + 8 fl oz + 20 fl oz	F							
4	Pennncozeb + Cevya	2 lb + 5 fl oz	B	5.8	**281**	**$1,239**	**5858**	20.8	**19.3**	94.0
	Penncozeb + Priaxor + Topsin	2 lb + 8 fl oz + 20 fl oz	F							
2	Penncozeb	2 lb	A	6.1	**282**	**$1,341**	**6342**	22.5	**19.0**	95.1
	Penncozeb + Cevya	2 lb + 5 fl oz	C							
	Penncozeb	2 lb	E							
	Penncozeb + Proline	2 lb + 5.7 fl oz	G							
3	Penncozeb	2 lb	A	6.3	**274**	$1,171	5625	20.5	**18.9**	93.9
	Penncozeb + Ceyva	2 lb + 5 fl oz	B							
	Penncozeb + Priaxor + Topsin	2 lb + 8 fl oz + 20 fl oz	F							
5	Penncozeb	2 lb	A	6.4	**290**	**$1,472**	**6837**	23.6	**19.4**	95.3
	Penncozeb + Cevya	2 lb + 5 fl oz	B							
	Penncozeb	2 lb	F							
6	Penncozeb	2 lb	B D F H	6.5	**286**	**$1,256**	**5877**	20.6	**19.1**	95.3
1	Untreated Check			8.8	**276**	**$1,258**	**5878**	21.2	**18.8**	94.6
Average				5.9	281	$1,289	6084	21.6	19.0	94.8
LSD 5%				1.2	22.7	263.1	1116.6	N.S.	1.6	N.S.
CV%				13.6	5.6	14.0	12.6	11.2	5.8	1.2

***All treatments included MasterLock @ 6.4 fl oz.**

****Application Dates for all treatments: A-7/9, B-7/17, C-7/22, D-8/1, E-8/8, F-8/13, G-8/30 and H-9/3**

*****Cercospora Rating (0-9 scale): 0 = no spots, 1 = Very few spots, 5 = up to 25% injury and 9 = leaves completely dead**

Comments: Study was designed to examine fungicide programs with chemistry available in Ontario with a CR+ variety. Alternaria and Cercospora leafspot pressure was good in this trial.

$/A: Payment calculated using early delivery adjustment where necessary, and the new quality payment minus fungicide and application cost.

Bold: Results are not statistically different from top-ranking treatment in each column.

Evaluate Sticker / Spreaders added to Fungicides for Cercospora

Blumfield East - Richville, MI - 2024

Trial Quality: Good
Variety: HIL-2332NT
Planted: May 6
Harvested: October 8
Plots: 6 rows X 38 ft, 4 reps
Row Spacing: 22 in.

Soil Info: Clay Loam
%OM: 3 **pH:** 8 **CEC:** 17.3
P: Very High **K:** Very High
Mn: High **B:** High
Added N: 36 lbs. 2X2 + 100 lbs. sidedress
Prev Crop: Wheat/Clover

Rhizoc Level: Low
Problems: None
Seeding Rate: 4.1 in.
Rainfall: 15.09 in.
Beets/100 ft: 170

Application: JD 3520 tractor mounted plot sprayer, compressed air, 100 psi, 25 gpa

No.	Sticker	Rate/A	Applic Timing	CLS*** Rate 7-Aug	RWST	Net $/A	RWSA	T/A	% SUC	% CJP
11	Nu-Film 17	16 fl oz	A-F	**1.9**	**240**	**$1,071**	**5743**	**23.9**	**16.9**	**93.5**
12	Nu-Film P	16 fl oz	A-F	**2.1**	220	**$995**	**5618**	**25.5**	**15.8**	**92.9**
9	WC-634 + WC-250	16 fl oz + 8 fl oz	A-F	**2.2**	**232**	**$1,069**	**5885**	**25.4**	**16.6**	**92.7**
8	WC-618	8 fl oz	A-F	**2.2**	**238**	**$1,022**	**5536**	**23.2**	**16.8**	**93.4**
3	MasterLock	6.4 fl oz	A-F	**2.4**	**234**	**$1,015**	**5561**	**23.9**	**16.4**	**93.5**
10	WC-450	3 fl oz	A-F	**2.4**	**247**	**$1,082**	**5748**	**23.3**	**17.1**	**94.3**
7	WC-250	8 fl oz	A-F	**2.5**	**240**	**$932**	**5060**	21.1	**16.9**	**93.4**
5	Reguard + Diligence	12 fl oz + 1.5 fl oz	A-F	**2.6**	210	$827	4867	**22.9**	14.6	**94.4**
4	Reguard	12 fl oz	A-F	**2.6**	**240**	**$1,029**	**5580**	**23.3**	**16.4**	**95.1**
2	None			**2.6**	**238**	$830	4534	19.2	**16.2**	**94.9**
6	MasterLock + Reguard	6.4 fl oz + 12 fl oz	A-F	2.8	**222**	$881	**5093**	**23.4**	**16.1**	92.3
1	Untreated Check			3.7	199	$602	3467	17.5	14.3	**93.0**
Average				2.5	230	$946	5224	22.7	16.2	93.6
LSD 5%				0.7	26.5	195.0	856.2	3.4	1.4	2.4
CV%				18.2	8.0	14.3	11.4	10.5	6.2	1.8

Spray Program for treatments**

A. EBDC* (2 lb) + Sticker
B. EDBC* (2 lb) + Provysol (5 fl oz) + Sticker
C. EBDC* (2 lb) + Super Tin (8 fl oz) + Sticker
D. EBDC* (2 lb) + Priaxor (8 fl oz) + Sticker
E. EBDC* (2 lb) + Proline (5.7 fl oz) + Sticker
F. EBDC* (2 lb) + Super Tin (8 fl oz) + Sticker

***EBDC = Manzate Pro-Stick @ 2 lb**

****Application dates for all treatments: A-7/1, B-7/12, C-7/24, D-8/9, E-8/20 & F-9/4**

*****Cercospora Rating (0-9 Scale): 0 = no spots, 1 = Very few spots, 5 = up to 25% injury and 9 = leaves completely dead.**

Comments: This study was designed to test adjuvants for improvement in Cercospora leafspot control with a fungicide program.

$/A: Payment calculated using early delivery adjustment where necessary, and the new quality payment minus fungicide and application cost.

Bold: Results are not statistically different from top-ranking treatment in each column.

Bayer CropScience Cercospora

Gilford - Fairgrove, MI - 2024

Trial Quality: Good
Variety: HIL-2332NT
Planted: April 25
Harvested: October 10
Plots: 6 rows X 38 ft., 4 reps
Row Spacing: 22 in.

Soil Info: Clay Loam
% OM: 4.4 **pH:** 8.3 **CEC:** 48.5
P: Very High **K:** Medium
Mn: High **B:** High
Added N: 36 lbs. 2X2 + 100 lbs sidedress
Previous Crop: Corn

Rhizoc Level: Low
Problems: None
Seeding Rate: 4.1 in.
Rainfall: 11.84 in.
Beets/100 ft: 155

Application: JD 3520 tractor mounted plot sprayer, compressed air, 100 psi, 25 gpa

No.	Treatment**	Rate/A	Applic Timing***	CLS**** Rate 7-Aug	RWST	Net $/A	RWSA	T/A	% SUC	% CJP
2	EBDC*	2 lb	A C E	**1.0**	**260**	**$1,586**	**8145**	**31.3**	**18.7**	**92.1**
	Propulse + Induce	13.6 fl oz + 3.84 fl oz	B D							
7	EBDC*	2 lb	A C E	**1.1**	246	$1,399	**7441**	**30.4**	**18.6**	90.1
	Luna Flex + Propulse + Induce	13.6 fl oz + 13.6 fl oz + 3.84 fl oz	B D							
5	EBDC*	2 lb	A C E	**1.1**	**256**	**$1,567**	**8136**	**31.8**	**18.6**	**91.8**
	Delaro + Luna Priviledge + Proline + Induce	11 fl oz + 2 fl oz + 1.7 fl oz 3.84 fl oz	B D							
4	EBDC*	2 lb	A C E	**1.3**	**253**	**$1,515**	**7837**	**31.0**	**18.6**	**91.2**
	Delaro + Proline + Induce	11 fl oz + 1.7 fl oz + 3.84 fl oz	B D							
6	EBDC*	2 lb	A C E	**1.4**	246	**$1,468**	**7663**	**31.2**	**18.5**	90.5
	Luna Flex + Induce	13.6 fl oz + 3.84 fl oz	B D							
3	EBDC*	2 lb	A C E	**1.4**	**257**	**$1,575**	**8066**	**31.4**	**19.0**	**91.1**
	Proline + Induce	5.7 fl oz + 3.84 fl oz	B D							
1	Untreated Check			3.1	241	$1,279	6631	27.5	17.7	**91.5**
Average				1.5	251	$1,484	7703	30.7	18.5	91.2
LSD 5%				0.4	13.0	160.3	717.6	2.7	0.7	1.1
CV %				17.1	3.5	7.3	6.3	5.9	2.7	0.8

***EBDC = Manzate Pro-Stick**

****All EBDC Treatments included MasterLock @ 6.4 fl oz**

*****Application Dates: A = 6/27, B = 7/11, C = 7/25, D = 8/7 and E = 8/20**

******Cercospora Rate (0-9 Scale): 0 = no spots, 1 = Very few spots, 5 = up to 25% injury and 9 = leaves completely dead.**

Comments: Study was designed to test Bayer CropScience Fungicides for Cercospora leafspot efficacy.

$/A: Payment calculated using early delivery adjustment where necessary, and the new quality payment minus fungicide and application cost.

Bold: Results are not statistically different from top-ranking treatment in each column.

UPL Cercospora

Gilford - Fairgrove, MI - 2024

Trial Quality: Good
Variety: BTS-1122
Planted: April 25
Harvested: October 10
Plots: 6 rows X 38 ft., 4 reps
Row Spacing: 22 in.

Soil Info: Clay Loam
% OM: 4.4 **pH:** 8.3 **CEC:** 48.5
P: Very High **K:** Medium
Mn: High **B:** High
Added N: 36 lbs. 2X2 + 100 lbs sidedress
Previous Crop: Corn

Rhizoc Level: Low
Problems: None
Seeding Rate: 4.1 in.
Rainfall: 11.84 in.
Beets/100 ft: 169

Application: JD 3520 tractor mounted plot sprayer, compressed air, 100 psi, 25 gpa

No.	Treatment**	Rate/A	Applic Timing	CLS*** Rate 7-Aug	RWST	Net $/A	RWSA	T/A	% SUC	% CJP
5	EBDC*	2 lb	27-Jun	**1.0**	260	**$1,825**	**9337**	**36.0**	**17.8**	94.6
	EBDC* + Delaro + Proline + Vacciplant	2 lb + 11 fl oz + 1.6 fl oz + 16 fl oz	2-Jul							
	EBDC* + Super Tin + Topsin	2 lb + 8 fl oz + 20 fl oz	2-Aug							
	EBDC* + Provysol + Vacciplant	2 lb + 8 fl oz + 16 fl oz	3-Sep							
3	EBDC* + Vacciplant	2 lb + 16 fl oz	27-Jun	**1.0**	262	**$1,835**	**9377**	**35.7**	**17.9**	94.7
	EBDC* + Delaro + Proline + Vacciplant	2 lb + 11 fl oz + 1.6 fl oz + 16 fl oz	2-Jul							
	EBDC* + Super Tin + Topsin + Vacciplant	2 lb + 8 fl oz + 20 fl oz + 16 fl oz	2-Aug							
	EBDC* + Provysol + Vacciplant	2 lb + 5 fl oz + 16 fl oz	3-Sep							
4	EBDC*	2 lb	27-Jun	**1.1**	263	**$1,842**	**9381**	**35.6**	**17.9**	95.0
	EBDC* + Delaro + Proline + Vacciplant	2 lb + 11 fl oz + 1.6 fl oz + 16 fl oz	2-Jul							
	EBDC* + Super Tin + Topsin + Vacciplant	2 lb + 8 fl oz + 20 fl oz + 16 fl oz	2-Aug							
	EBDC* + Provysol + Vacciplant	2 lb + 5 fl oz + 16 fl oz	3-Sep							
2	EBDC*	2 lb	27-Jun	**1.1**	251	**$1,754**	**9106**	**36.4**	**17.8**	92.8
	EBDC* + Delaro + Proline	2 lb + 11 fl oz + 1.6 fl oz	2-Jul							
	EBDC* + Super Tin + Topsin	2 lb + 8 fl oz + 20 fl oz	2-Aug							
	EBDC* + Provysol	2 lb + 5 fl oz	3-Sep							
6	EBDC*	2 lb	27-Jun	1.5	255	**$1,735**	**8959**	**35.1**	**18.1**	92.9
	EBDC* + Delaro + Proline	2 lb + 11 fl oz + 1.6 fl oz	2-Jul							
	EBDC* + Super Tin + Topsin + Vacciplant	2 lb + 8 fl oz + 20 fl oz + 16 fl oz	2-Aug							
	EBDC* + Provysol + Vacciplant	2 lb + 5 fl oz + 16 fl oz	3-Sep							
1	Untreated Check			2.9	240	$1,496	7776	32.4	16.4	94.9
	Average			1.4	255	$1,748	8989	35.2	17.6	94.2
	LSD 5%			0.4	N.S.	292.4	1046.4	1.6	0.5	N.S.
	CV %			19.7	7.3	11.1	7.7	3.0	1.9	2.8

***EBDC = Manzate Pro-Stick**

****All treatments included MasterLock @ 6.4 fl oz**

*****Cercospora Rate (0-9 Scale): 0 = no spots, 1 = Very few spots, 5 = up to 25% injury and 9 = leaves completely dead.**

Comments: Study was designed to test UPL Fungicides for Cercospora leafspot efficacy.

$/A: Payment calculated using early delivery adjustment where necessary, and the new quality payment minus fungicide and application cost.
Bold: Results are not statistically different from top-ranking treatment in each column.

Evaluation of foliar fungicides to manage Cercospora leaf spot of CR+ sugar beet in Michigan, 2024

Chris Bloomingdale and Jaime Willbur, Michigan State University

Location: Frankenmuth (SVREC)	**Treatment Timings:** 21-28 days
Planting Dates: April 25, 2024	**Pesticides:** see table
Soil Type: Loam	**O.M.:** 5.08 **pH:** 7.5
Replicates: 4	**Variety:** C-G227

Summary: All fungicide programs had significantly lower AUDPCs than the non-treated control ($P < 0.0001$); values ranged from 1125.2-1232.8 for programs, while the control had a value of 2795.4. Programs 2, 3, 5, and 6 had significantly greater yields than the control ($P < 0.05$). All programs had significantly greater sugar content ($P < 0.0001$) and RWST ($P < 0.001$) than the control. Treated programs had a sugar content between 14.4 and 14.8% and an RWST between 248.5 and 255.4 lbs sugar/A; the control had a sugar content of 13.1% and RWST value of 218.9 lbs sugar/A.

Table 1. Area under the disease progress curve (AUDPC) and yield parameters from the tested fungicide programs.

No.	Treatment (Rate[a]) and Timing[b]	AUDPC[c,d]		Yield (t/A)		Sugar (%)		RWST[e]	
1	Non-treated control	2795.4	a	17.4	b	13.1	b	218.9	b
2	Dithane F45 (51 fl oz) ABCD + Inspire XT (7 fl oz) BD + Super Tin (8 fl oz) C	1129.3	b	22.3	a	14.8	a	255.4	a
3	Dithane F45 (51 fl oz) ABCD + Proline (5.7 fl oz) B + Super Tin (8 fl oz) C + Provysol (5 fl oz) D	1125.2	b	21.0	a	14.8	a	255.2	a
4	Dithane F45 (51 fl oz) ABCD + Domark (6.9 fl oz) B + Super Tin (8 fl oz) C + Provysol (5 fl oz) D	1232.8	b	20.6	ab	14.4	a	248.5	a
5	Dithane F45 (51 fl oz) AC + Badge (32 fl oz) BD + Domark (6.9 fl oz) B + Super Tin (8 fl oz) C + Provysol (5 fl oz) D	1140.9	b	22.4	a	14.8	a	252.2	a
6	Dithane F45 (51 fl oz) AC + Badge (32 fl oz) BD + Provysol (5 fl oz) B + Super Tin (8 fl oz) C + Domark (6.9 fl oz) D	1188.3	b	23.0	a	14.8	a	252.5	a

[a] All rates, unless otherwise specified, are listed as a measure of product per acre. MasterLock was added to all tank mixes at a rate of 0.25 % v/v.
[b] Application letters code for the following dates: A=27 Jun, B=2 Jul, C=28 Jul, and D=23 Aug.
[c] Area under the disease progress curve was calculated using disease severity scores (0-10 scale) collected 1 Jul, 18 Jul, 28 Jul, 12 Aug, and 29 Aug.
[d] Column values followed by the same letter were not significantly different based on Fisher's Protected LSD (α=0.05). If no letter, then means were not significantly different.
[e] Pounds of recoverable white sugar per ton of beets.

Evaluation of foliar fungicides to manage Cercospora leaf spot of sugar beet in Michigan, 2024

Chris Bloomingdale and Jaime Willbur, Michigan State University

Location: Frankenmuth (SVREC)	**Treatment Timings:** 14-day interval starting at 35 DSV
Planting Dates: April 24, 2024	**Pesticides:** see table
Soil Type: Loam	**O.M.:** 5.08 **pH:** 7.5
Replicates: 4	**Variety:** HIL-2332NT

Summary: Significant CLS pressure was observed uniformly throughout this study; all fungicide programs had significantly lower AUDPCs than the non-treated control ($P < 0.0001$). AUDPCs for fungicide programs ranged between 175.0 and 357.2, while the control program had an AUDPC of 393.4. Significant differences were observed in estimated yield values ($P < 0.01$). Programs 3-6, 8, and 10-12 had greater yields (17.9-20.4 t/A) than the control (14.5 t/A). Programs 2-6, 8, and 10-12 had significantly greater sugar content ($P < 0.0001$) than the control, while programs 2-6, 8, 10, and 12 had greater RWST ($P < 0.0001$) than the control.

Table 1. Area under the disease progress curve (AUDPC) and yield parameters from the tested fungicide programs.

No.	Treatment[a] (Rate[b]) and Timing[c]	AUDPC[d, e]	Yield (t/A)	Sugar (%)	RWST[f]
1	Non-treated control	393.4 a	14.5 cd	13.6 d	227.6 ef
2	Dithane F45 (1.6 qt) ABCDE + Inspire XT (7 fl oz) BD + Super Tin (8 fl oz) CE + Badge (1.5 pt) F	218.1 e	17.7 a-c	15.0 b	258.5 c
3	Dithane F45 (1.6 qt) ABDF + Proline (5.7 fl oz) B + Agri Tin (8 fl oz) CE + Inspire XT (7 fl oz) D + Domark (6.9 fl oz) F	175.0 f	18.0 ab	15.6 a	271.6 ab
4	Dithane F45 (1.6 qt) AB + Proline (5.7 fl oz) B + Agri Tin (8 fl oz) CE + Inspire XT (7 fl oz) D + Domark (6.9 fl oz) F	186.1 f	19.0 a	15.7 a	279.6 ab
5	Dithane F45 (1.6 qt) AB + Proline (5.7 fl oz) B + Agri Tin (8 fl oz) CE + EXP 1 (7 fl oz) DF	200.3 ef	19.2 a	15.3 ab	270.0 a-c
6	Dithane F45 (1.6 qt) AB + EXP 2 (30 fl oz) ABCDEF + Proline (5.7 fl oz) B + Agri Tin (8 fl oz) CE + EXP 1 (7 fl oz) DF	180.9 f	20.4 a	15.3 ab	264.7 bc
7	EXP 2 (30 fl oz) ABCDEF	357.2 b	13.4 d	13.4 d	221.4 f
8	Dithane F45 (1.6 qt) ABCDE + EXP 3 (20.5 fl oz) BD + Super Tin (8 fl oz) CE + Badge (1.5 pt) F	200.0 ef	20.1 a	15.4 ab	264.9 bc
9	EXP 4 (41 fl oz) ABCDE + Kocide 3000 (1.5 lb) F	352.4 b	15.5 b-d	13.7 d	229.7 ef
10	Koverall (1.5 lb) ABCDE + Kocide 3000 (1.5 lb) F	248.8 d	17.9 ab	14.3 c	243.8 d
11	EXP 4 (41 fl oz) ABCDE + EXP 5 (5.7 fl oz) ACE + Agri Tin (8 fl oz) BD + Kocide 3000 (1.5 lb) F	294.3 c	18.3 ab	14.2 c	239.1 de
12	Koverall (1.5 lb) ABCDE + EXP 5 (5.7 fl oz) ACE + Agri Tin (8 fl oz) BD + Kocide 3000 (1.5 lb) F	197.8 ef	18.5 ab	15.1 b	264.6 bc

[a] EXP=experimental product.

[b] All rates, unless otherwise specified, are listed as a measure of product per acre. MasterLock was added to all tank mixes at a rate of 0.25 % v/v.

[c] Application letters code for the following dates: A=27 Jun, B=9 Jul, C=23 Jul, D=3 Aug, E=13 Aug, and F=23 Aug.

[d] Area under the disease progress curve was calculated using disease severity scores (0-10 scale) collected 1 Jul, 18 Jul, 28 Jul, 12 Aug, and 29 Aug,

[e] Column values followed by the same letter were not significantly different based on Fisher's Protected LSD (α=0.05). If no letter, then means were not significantly different.

[f] Pounds of recoverable white sugar per ton of beets.

Fungicide resistance monitoring for *Cercospora beticola* populations in Michigan, 2021-23

Alexandra P. Hernandez[1], Sarah Ruth[1], Linda Hanson[1,2] and Jaime F. Willbur[1]; Michigan State University, [2]USDA-ARS

Objective 1: Monitor seasonal changes in fungicide resistance of foliar sugarbeet pathogens.

Methods: For Cercospora leaf spot (CLS), leaf samples were collected early-, mid-, and late-season. Approximately 8 lesions were collected at each timepoint, and field site and mono-conidial isolates were obtained from sporulating lesions. Across nine counties in east-central Michigan, 29, 30, and 15 field locations were sampled in 2021, 2022, and 2023, respectively. Concentrations that effectively inhibited 50% of mycelial growth (EC_{50}) were determined through spiral gradient plating (Förster et al. 2004; Torres-Londoño et al. 2016; Rosenzweig et al. 2020). Isolates were tested for sensitivity to pyraclostrobin (FRAC 11, QoI), thiophanate-methyl (FRAC 1, MBC), difenoconazole, tetraconazole, prothioconazole, mefentrifluconazole, and fenbuconazole (FRAC 3, DMI), and triphenyltin hydroxide (FRAC 30).

Results: Resistance to DMI fungicides varied by active ingredient; *C. beticola* isolates exhibited the highest level of *in vitro* resistance to prothioconazole, followed by tetraconazole (Figure 1). High frequencies of resistance to pyraclostrobin were observed across Michigan. Some reduced sensitivity to triphenyltin hydroxide was observed; however, the degree of resistance was lower than for other fungicide classes with no isolates having EC_{50} values >10 ppm (Figure 1). The frequency of *C. beticola* isolates resistant to thiophanate-methyl increased significantly (from 71% to 85%) from 2021 to 2022 ($P < 0.05$). From consecutive timepoint sampling, fungicide resistance was found to be significantly associated with increasing numbers of DMI applications for prothioconazole and tetraconazole and MBC applications for thiophanate-methyl ($P < 0.05$; data not shown).

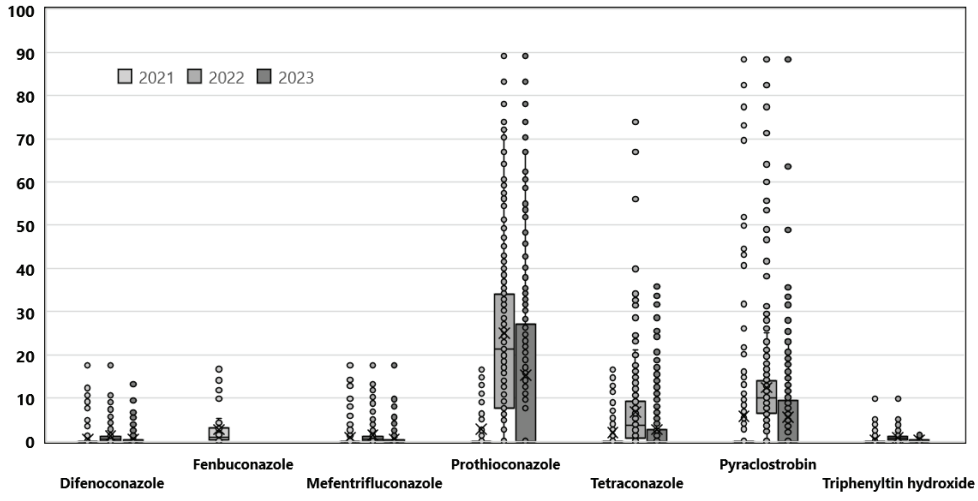

Figure 1. Box plots of the EC_{50} values for each fungicide active ingredient tested for *C. beticola* isolates collected in 2021 (n = 78 isolates), 2022 (n = 304-347), and 2023 (n = 145-156). The box represents the interquartile interval where 50% of the data points are found. The line that divides the box is the median and "X" represents the mean. The lines that extend vertically show variability outside of the interquartile interval. The upper limits were about 18 µg/ml for difenoconazole, fenbuconazole, and mefentrifluconazole, 18 µg/ml (2021) and 89 µg/ml (2022 and 2023) for prothioconazole, 18 µg/ml (2021) and 89 µg/ml (2022 and 2023) for

tetraconazole, 88 µg/ml for pyraclostrobin, 89 µg/ml for thiophanate methyl, and 18 µg/ml triphenyltin hydroxide.

Objective 2: Optimize early-season techniques to monitor foliar pathogen sensitivity to critical fungicide groups.

Methods: *In vitro* fungicide sensitivity testing was compared to polymerase chain reaction restriction fragment length polymorphism (PCR-RFLP) assays which detect point mutations associated with resistance to major fungicide groups: G143A for QoI EC_{50} values > 100 ppm (Rosenzweig et al. 2015), E198A for MBC EC_{50} values ≥ 60 ppm (Rosenzweig et al. 2015), and Glu169 for DMI EC_{50} values of 65-115 ppm (Nikou et al. 2009). A total of 78 and 373 *C. beticola* isolates were screened in 2021 and 2022, respectively.

Results: The benzimidazole PCR marker predicted resistance to thiophanate-methyl (>60 µg/ml) with 99% accuracy. The mutation was present in 68% of isolates screened in 2021 and 74% in 2022. All isolates screened possessed the mutation associated with QoI resistance; however, *in vitro* EC_{50} values for pyraclostrobin ranged from 0.8 ppm (lower limit of assay) to 88.4 ppm (upper limit). Others have also observed that the G143A mutation confers a relatively low level of QoI resistance in *C. beticola* (Bolton et al. 2013). Therefore, this mutation may not meaningfully represent field performance of QoI products for CLS.

The frequency of *C. beticola* isolates with the mutation associated with DMI resistance was 21% in 2021 and 13% in 2022. Based on linear mixed model analyses, difenoconazole and mefentrifluconazole EC_{50} values significantly increased when the mutation was present (Figure 2), while tetraconazole EC_{50} values were significantly reduced, and fenbuconazole and prothioconazole responses were not affected. Resistance to triazoles is a complex trait controlled by multiple genes (Rangel et al. 2020) and further studies are needed to explore the explanatory potential of other mutations associated with DMI resistance (Spanner et al. 2021).

County-level frequencies of *C. beticola* resistance to several active ingredients also revealed interesting spatial trends (Figure 3). For example, central and eastern sugar beet producing counties tended to have higher frequencies of resistance to tetraconazole (Figure 3A) and thiophanate-methyl (Figure 3D). The opposite was observed for difenoconazole where central and western counties tended to have higher frequencies of resistance and eastern counties the lowest (Figure 3B). Interestingly, frequencies of tin resistance were higher in the western-most counties (Figure 3C). Observations were likely driven by regional management decisions.

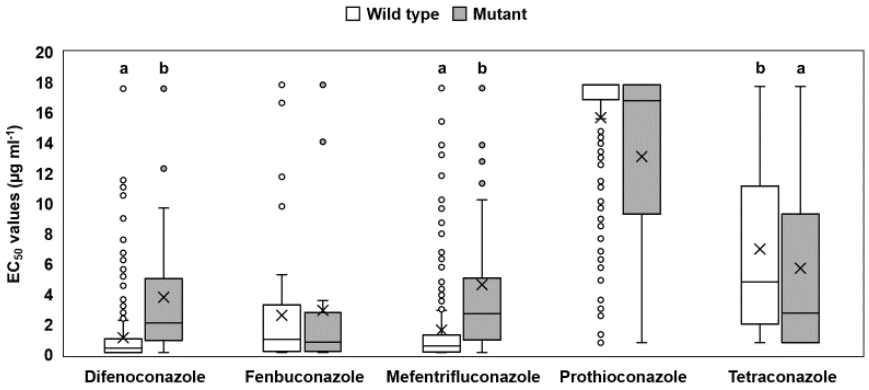

Figure 2. Box plots of *Cercospora beticola* EC_{50} values with (mutant) and without (wild type) the Glu169 mutation associated with DMI resistance for each active ingredient tested in 2021 and 2022. Significant differences are indicated by letters assigned using pairwise comparison with *P*-values adjusted for multiple testing by the Bonferroni method (α=0.05).

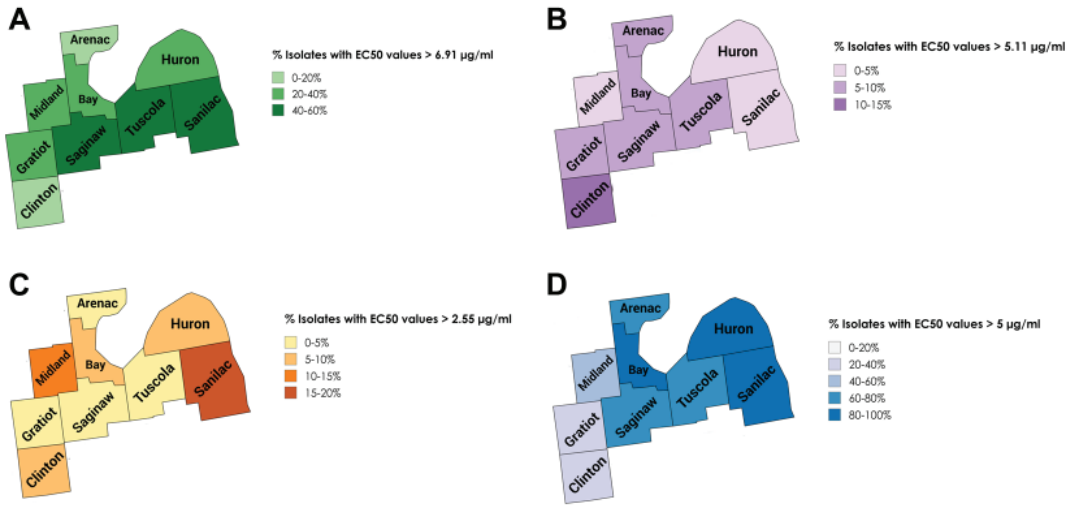

Figure 3. County-level percentages of *Cercospora beticola* isolates with reduced sensitivity based on EC_{50} k-means established thresholds to (A) tetraconazole, (B) difenoconazole, (C) triphenyltin hydroxide, and > 5 µg ml^{-1} (D) thiophanate-methyl (Secor et al. 2010; Bolton et al. 2012b). Isolates were pooled across both sampling years 2021 (29 field locations) and 2022 (30 field locations). Michigan sugarbeet growing counties included in this study were Arenac (n = 12 isolates), Bay (n =124), Clinton (n = 18), Gratiot (n = 24), Huron (n = 77), Midland (n = 4), Saginaw (n = 33), Sanilac (n = 40), and Tuscola (n = 41).

Overall Summary:

- Laboratory-level resistance was particularly widespread for the DMIs prothioconazole and tetraconazole as well as the QoI pyraclostrobin and the MBC thiophanate-methyl.
- While the PCR-RFLP rapid detection technique was highly accurate at predicting MBC resistance, the mutations used in this study were not sufficient for accurately predicting QoI or DMI *in vitro* sensitivity for *C. beticola* isolates.
- County-level fungicide resistance trends may be useful to direct regional management recommendations and decisions to mitigate further resistance development.

Future Directions: Isolates collected in 2024 will be tested using the spiral gradient method and compared to previous years to assess shifts in *C. beticola* populations. Additional mutations associated with DMI resistance will be tested for their ability to predict isolate sensitivity. Newer qPCR techniques (Shrestha et al. 2020) will also be investigated for screening optimization.

Acknowledgements: We thank the Michigan sugar beet industry for access to these fields and thank Michigan Sugarbeet Advancement and the Michigan Sugar Company for collection of sample materials. This work is supported by the Michigan Sugar Company, Michigan State University Project GREEEN, USDA-ARS, and the Beet Sugar Development Foundation.

Investigation of cover crops for Cercospora leaf spot control in sugarbeet

Alexandra P. Hernandez[1], Chris Bloomingdale[1], Linda Hanson[1,2] and Jaime F. Willbur[1];
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Investigating the interactions between various cover crops and *C. beticola* could inform the potential use of these practices in CLS management. This study aims to determine the impact of common cover crops on *C. beticola* growth and CLS on sugarbeet in Michigan. This research will provide valuable insights for sustainable management strategies for CLS on sugarbeet.

Objective 1: Assess *in vitro* germling-induced inhibition of *C. beticola* for several cover crops

Methods: Seeds were surface disinfested, germinated, and plated adjacent to *C. beticola* isolates to assess inhibitory properties of five cover crop types compared to a no seed control. 'Wheeler' rye (*Secale cereale*), crimson clover (*Trifolium incarnatum*), yellow mustard (*Sinapis alba*), common oat (*Avena sativa*), and oilseed radish seeds (*Raphanus sativus*) (Johnny's Selected Seeds, Winslow, ME) were placed on the opposite side of the media plate as a 5-mm plug from a pure culture of *C. beticola* isolate, 'Blum 1-2' or 'RangeA', 3 cm from the edge. Treatments were replicated four times. Isolate radial growth on the seed-bearing and seedless sides were measured using a digital caliper at one- and two-weeks after initiation of the experiment. Percent growth of *C. beticola* was calculated for each seed treatment, as well as the control plates without seeds, by dividing the seed side radius by the no-seed side radius.

Results: *In the absence of antibiotics,* only Crimson clover reduced the growth of *C. beticola* on sugarbeet leaf extract agar (SBLEA) after two weeks ($P < 0.01$; Table 1).

In the presence of antibiotics, Wheeler rye germlings significantly reduced *C. beticola* growth in both media types at two weeks ($P < 0.01$; Table 2). Common oat germlings significantly increased growth of *C. beticola* on soil extract agar (EA) with antibiotics after one week but not at two weeks or on SBLEA ($P < 0.05$; Table 3). Crimson clover, Defender oilseed radish, and yellow mustard did not significantly impact *C. beticola* growth ($P > 0.05$).

Table 1. Percent growth of *C. beticola* at 1 week and 2 weeks after placement adjacent to germinated seed of Crimson clover and Defender oilseed radish on SBLEA and soil extract agar (EA) without antibiotics.

Treatment	**Percent growth (%)**			
	SBLEA		Soil EA	
	Week 1	Week 2	Week 1	Week 2
Control	98.1	98.1 a	-	-
Crimson clover	97.3	76.3 b	-	-
Defender oilseed radish	100.5	95.8 a	-	-
SE	*4.2*	*3.0*	-	-
P-value	*0.8619*	*0.0069* **	-	-
LSD	-	*11.6*	-	-

Table 2. Percent growth of *C. beticola* at 1 week and 2 weeks after placement adjacent to germinated seed of Wheeler rye on SBLEA and soil extract agar (EA) amended with antibiotics streptomycin (0.5 ug/ml) and ampicillin (0.25 ug/ml).

Treatment	Percent growth (%)			
	SBLEA		Soil EA	
	Week 1	Week 2	Week 1	Week 2
Control	95.2	103.7 a	113.7	99.1 a
Wheeler rye	98.1	81.4 b	89.6	88.2 b
SE	*5.6*	*3.1*	*4.3*	*3.0*
P-value	*0.793*	*0.002 ** *	*0.0778*	*0.0071 ** *
LSD	-	*7.0*	-	*5.2*

Table 3. Percent growth of *C. beticola* at 1 week and 2 weeks after placement adjacent to germinated seed of common oat on SBLEA and soil extract agar (EA) amended with antibiotics streptomycin (0.5 ug/ml) and ampicillin (0.25 ug/ml).

Treatment	Percent growth (%)			
	SBLEA		Soil EA	
	Week 1	Week 2	Week 1	Week 2
Control	96.3	103.7	84.6 b	110.4
Common oat	92.3	104.4	122.5 a	155.8
SE	*1.6*	*3.1*	*4.4*	*22.3*
P-value	*0.1682*	*0.893*	*0.0177 * *	*0.2183*
LSD	-	-	*25.4*	-

Objective 2: Evaluated fall-planted cover crops for CLS control in sugarbeet field studies

Methods: In 2021-22 and 2023-24, fall-planted cover crop treatments were tested in field trials at the Saginaw Valley Research and Extension Center (SVREC). Treatments were replicated four times in 3 m by 18 m plots using a randomized complete block design with 1.5 m wheat buffers. Cover crops treatments, including rye, radish, and a combination of oat and clover, were planted after sugarbeet harvest with the aim to decrease *C. beticola* inoculum survival. The seeding rates for Wheeler rye (Moore Seed Farm, Elsie, MI), Defender oilseed radish (P. H. PETERSEN, Lundsgaard, Schleswig-Holstein, Germany), common oats (Johnny's Selected Seeds, Winslow, ME), and Crimson clover (Johnny's Selected Seeds, Winslow, ME) were 100, 35, 8, and 9 pounds per acre, respectively. In the spring, highly CLS-susceptible sentinel beets were placed biweekly into the plots to measure CLS pressure from April to June. One week of data was collected before the termination of the cover crops, and subsequent sampling took place after chemical termination using Roundup (Bayer, Leverkusen, Germany).

Results: In 2021-22 no significant differences in leaf degradation, *C. beticola* sporulation or viability, sentinel beet lesions, yield, percent sugar, RWSH, and RWS were observed for the Wheeler rye (or factory lime) treatments compared to the non-treated control ($P > 0.05$). However, the Wheeler rye cover crop significantly reduced area under the disease progress curve

(AUDPC) the following season compared to the non-treated control ($P < 0.0001$; Figure 2). No significant difference between the CLS ratings on sentinel beets was observed for treatments in the 2023-24 study (Figure 3).

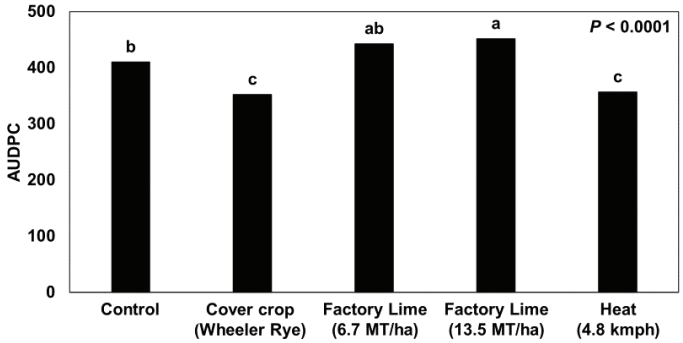


Figure 2. From 2021-22 field studies, area under the disease progress curve (AUDPC) following fall-applied treatments of a Wheeler rye cover crop, two factory lime rates, and the 4.8-kmph heat treatment compared to a non-treated control.

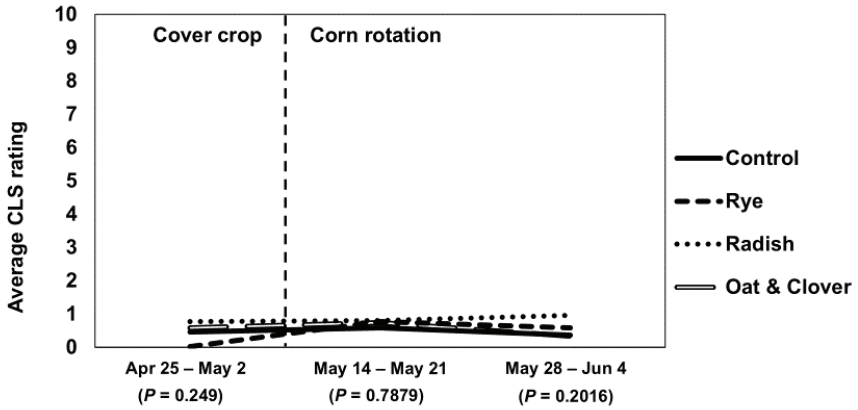


Figure 3. From 2023-24 field studies, average bi-weekly severity ratings (0-10) on highly-CLS susceptible sentinel beets exposed for one week in field plots then incubated in a humidity chamber for 3 days and monitored at ambient conditions for 3 weeks. Lines represent Wheeler rye, Defender oilseed radish, and common oats mixed with Crimson clover treatments compared to a non-treated control.

Overall Summary:

- Based on laboratory assays, Crimson clover and Wheeler rye showed potentially useful inhibitory effects on *C. beticola* growth in culture.

- In field studies, suppression of CLS development was also observed following a fall-planted rye cover crop. However, this did not correspond to a significant reduction in early-season inoculum levels. Further field tests are needed to understand these impacts.

Acknowledgements: We thank the Michigan sugar beet industry, Michigan Sugarbeet Advancement, and the Michigan Sugar Company for guidance and support of this work. Funding is provided by the Michigan Sugar Company, MSU Project GREEEN, and USDA Sustainable Sugar Beet Research Initiative.

Fungicide resistance screening for leaf spot pathogens of sugar beet, 2023-24

Emily Jordyn Weedon[1], Sarah Ruth[1], Linda Hanson[1,2], and Jaime F. Willbur[1]; [1]Michigan State University, [2]USDA-ARS

Background: In 2015, Michigan growers reported increasing yield reduction caused by defoliation associated with Alternaria leaf spot (ALS) (Rosenzweig et al., 2017). Increased *in vitro* resistance has additionally been described for *Alternaria* spp. populations collected in Michigan fields (Rosenzweig et al., 2017; Rosenzweig et al., 2019). Interestingly, a potential biological trade-off for fungicide resistance has been proposed in the Cercospora leaf spot (CLS) pathosystem, as demethylation inhibitor (DMI) resistant isolates of *C. beticola* had increased sensitivities after being exposed to prolonged cold temperatures of -20°C (Karaoglanidis and Thanassoulopoulos, 2002; Arabiat et al., 2017). Studies of a potential biological trade-off in resistant *Alternaria* spp. isolates are currently lacking. Further research will guide management of beet leaf spot diseases in Michigan.

Objective 1: Characterize virulence and fungicide resistance of *Alternaria* spp. isolates from sugar beet. In 2022, 74 isolates of *Alternaria* spp. were collected across six Michigan counties and in 2023, 48 *Alternaria* isolates were collected. These isolates were then tested for virulence using a detached leaf-assay using 2-month-old sugar beets of the Alternaria leaf spot susceptible variety, CR-059. Spore suspensions were collected from pure isolate cultures and adjusted to $1x10^4$ conidia/ml using a hemocytometer. Lesion development was recorded daily beginning two days post inoculation for five days. This experiment was repeated twice.

Initial *in-vitro* fungicide sensitivities were collected for six fungicides active ingredients registered for management of leaf spot diseases in sugar beet in Michigan. These include four DMI fungicides (FRAC 3), difenoconazole, mefentrifluconazole, prothioconazole, and tetraconazole, as well as triphenyltin-hydroxide (FRAC 30), and thiophanate methyl (FRAC 1) (Rosenzweig et al., 2017; Rosenzweig et al., 2019). Plates were fungicide-amended using a gradient spiral dilution method (Förster et al, 2004) and spore suspensions were streaked onto them. The effective concentration to inhibit mycelial growth by 50% (EC_{50}) were determined four days post-inoculation. In the initial fungicide sensitivity screening, isolates were phenotypically categorized as previously defined by Rosenzweig et al. (2019) as resistant (EC_{50} >100 ppm), insensitive (EC_{50} = 50-100 ppm), moderately insensitive (EC_{50} = 10-50 ppm), reduced sensitive (EC_{50} = 1-10 ppm), and sensitive (EC50 <1 ppm) (Figure 1).

Results: In 2022, only 53% of the *Alternaria* spp. isolates caused significant lesion development ($P < 0.05$). Of the 74 isolates screened, 57 isolates resulted in more severe lesion development than the previously characterized P23 isolate. In 2023, 93% of the *Alternaria* isolates screened were significantly different from the control ($P < 0.05$). Water controls for both tests were negative for any lesion development. In both years of testing, the greatest frequencies of *in vitro* sensitivity (EC_{50} <1 ppm) were observed for difenoconazole and mefentrifluconazole (93-100% of *Alternaria* isolates) (Figure 1A and 1B). The greatest frequencies of *in vitro* insensitivity (EC_{50} 50-100+ ppm) were observed for thiophanate-methyl (81-100% of isolates). For triphenyltin hydroxide, most *Alternaria* isolates were categorized as sensitive to reduced sensitive (EC_{50} <1 to 10 ppm) (63-96%).

A

Active Ingredient	Sensitive (EC_{50} <1 ppm)	Reduced Sensitive (EC_{50} = 1-10 ppm)	Moderately Insensitive (EC_{50} = 10-50 ppm)	Insensitive (EC_{50} = 50-100 ppm)
Difenoconazole	93%	6%	-	-
Mefentrifluconazole	100%	-	-	-
Prothioconazole	27%	9%%	42%	22%
Tetraconazole	6%	40%	16%	37%
Thiophanate-methyl	-	7%	12%	81%
Pyraclostrobin	6%	10%	33%	51%
Triphenyltin hydroxide	2%	61%	20%	18%

B

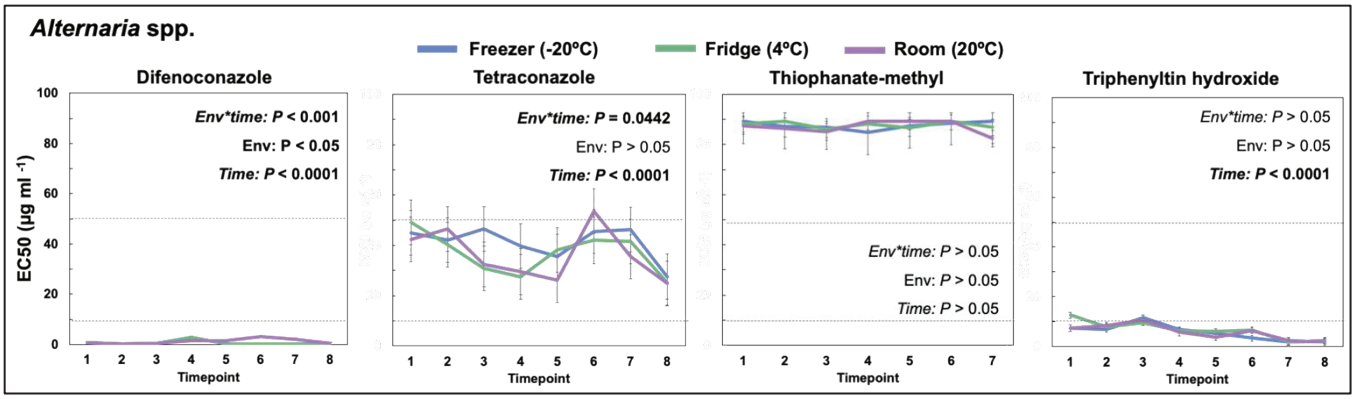
Active Ingredient	Sensitive (EC_{50} <1 ppm)	Reduced Sensitive (EC_{50} = 1-10 ppm)	Moderately Insensitive (EC_{50} = 10-50 ppm)	Insensitive (EC_{50} = 50-100 ppm)
Difenoconazole	96%	4%	-	-
Tetraconazole	-	56%	33%	10%
Thiophanate-methyl	-	-	-	100%
Pyraclostrobin + SHAM	-	33%	10%	52%
Triphenyltin hydroxide	52%	46%	2%	-

Figure 1: Frequences for initial fungicide sensitivities across **A)** 74 *Alternaria* spp. isolates from 2022 and **B)** 48 *Alternaria* spp. isolates from 2023. The p-values denoting differences between isolates in 2022 were: 0.004 (mefentrifluconazole), 0.5 (difenoconazole), <0.0001 (prothioconazole), <0.001 (tetraconazole), <0.0001(thiophanate-methyl), and <0.001 (triphenyltin hydroxide). The p-values denoting differences between isolates in 2023 were: < 0.05 (difenoconazole), < 0.001 (tetraconazole), > 0.05 (thiophanate-methyl), and < 0.001 (triphenyltin hydroxide).

Objective 2: Evaluate potential cold temperature effects on fluctuations in fungicide sensitivity. Seven *Alternaria spp.* isolates (including the previously characterized *A. alternata* isolate P23 (Jayawardana, 2022)), and seven *C. beticola* from 2022 and 2023 were placed into three temperature-controlled environments (20, 4, and -20°C) using a split-plot design. Fungicide sensitivity was tested as previously described against difenoconazole, tetraconazole, thiophanate-methyl, or triphenyltin hydroxide. Screening began at two weeks and then continued every subsequent month for seven months.

Results: Preliminary data from the first year suggests that sensitivities of both *Alternaria* spp. and *C. beticola* isolates to triphenyltin-hydroxide were significantly impacted by time ($P < 0.05$) (Figure 2A and 2B). While the interaction between environment and time caused significant shifts in responses to difenoconazole ($P < 0.0001$) and tetraconazole ($P < 0.0001$) for *Alternaria* spp. isolates, no consistent shifts in resistance categories were observed. Environment did not induce significant changes to fungicide sensitivities for any of the active ingredients against *C. beticola*. Again, no other consistent shifts in resistance categories were observed for *C. beticola*. Data collection for the remaining timepoints of the second repetition of the experiment is in progress for *Alternaria* spp. and *C. beticola*.

A



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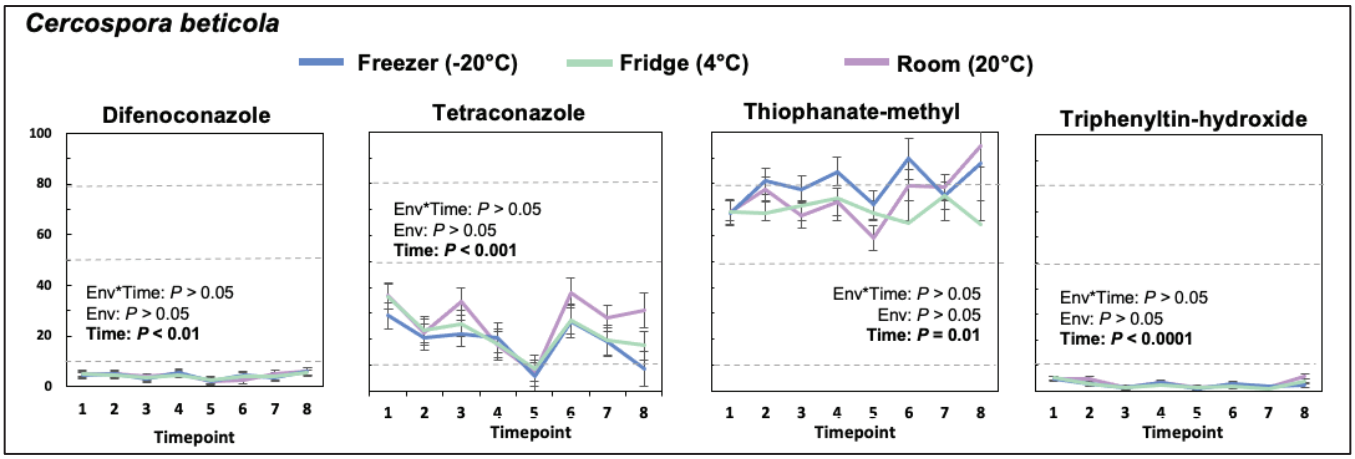

Figure 2: First year of mean EC_{50} values across *Alternaria* spp. and *C. beticola* isolates after incubation at 20°C, 4°C, or -20°C for up to seven months. Significance is denoted by p-value, with statistically significant results bolded.

Overall Summary:

- Similar levels of insensitivity were observed for tetraconazole and prothioconazole across *Alternaria* spp. isolates. Difenoconazole and mefentrifluconazole also had comparable responses with many isolates being classified as sensitive or reduced sensitive.
- A consistent shift to increased sensitivity was observed for triphenyltin-hydroxide, especially for *Alternaria* spp. isolates. The biological relevancy of these shifts could be investigated.

Future Directions: Data collection is ongoing for the cold-environment experiments. Additionally, virulence of *Alternaria* spp. isolates will be further characterized using a selection of commercial sugar beet varieties. The thresholds for sensitivity categories are also being reevaluated to identify a more biologically-relevant grouping system to better reflect resistance responses in these populations.

Acknowledgements: We thank the Michigan sugar beet industry for access to field sites and thank Michigan Sugarbeet Advancement and the Michigan Sugar Company for collection of sample materials. This work is supported by the Michigan Sugar Company, Michigan State University Project GREEEN, and USDA-ARS.

Valent Nematode / Seed Treatment Trial
Wadsworth - Sandusky, MI - 2024

Trial Quality: Fair
Planted: May 1
Harvested: September 18
Plots: 6 rows X 38 ft., 4 reps
Row Spacing: 22 in.

Soil Info: Clay Loam
% OM: 4.6 **pH:** 7.7 **CEC:** 16.4
P: Very High **K:** High
Mn: High **B:** High
Added N: 36 lbs. 2X2 + 90 lbs. PPI
Previous Crop: Dry Beans

Rhizoc Level: Low
Cerc Control: Good
Problems: None
Seeding Rate: 4.1 in.
Rainfall: 11.37 in.
Beets/100 ft: 194

Application: Monosem 6-row Agronomy Planter, compressed air, 30 psi, 9 gpa - IF, 3.5" band

No.	Treatment	Applic Timing	Applic Method	RWST	Net $/A	RWSA	T/A	% SUC	% CJP	B/100	Dead B/100
										17-May	31-Jul
3	Untreated			245	**$2,120**	9584	**39.2**	16.6	95.3	**204**	0.4
2	Sebring, Zeltera, Intego Solo Nipsit Inside Insect, Aveo EZ	At Plant	Seed Treatment	243	**$1,900**	8614	35.4	16.0	96.8	**197**	1.1
1	Sebring, Zeltera, Intego Solo Nipsit Inside Insect	At Plant	Seed Treatment	239	$1,894	**8653**	**36.2**	16.3	95.2	181	0.2
Average				242	$1,971	8950	36.9	16.3	95.7	194.0	0.6
LSD 5%				N.S.	218.4	868.4	3.3	N.S.	N.S.	13.4	N.S.
CV%				3.4	6.4	5.6	5.2	4.0	1.3	4.0	119.9

Comments: Study was designed to test the efficacy of seed treatments in management of beet cyst nematode.

$/A: Payment calculated using early delivery adjustment where necessary, and the new quality payment minus fungicide and application cost.

Bold: Results are not statistically different from top-ranking treatment in each column.

Organic Amendments as a Sustainable Solution for Managing Sugar Beet Cyst Nematode in Michigan

Ali Yaghoubi and Marisol Quintanilla. Michigan State University, Department of Entomology.

Effective management of the sugar beet cyst nematode (*Heterodera schachtii*, BCN) is critical for sustaining sugar beet production in Michigan. Organic amendments, such as compost and manure, have emerged as promising tools for managing BCN and enhancing crop yields. This study evaluated nine composts and manures for their impact on BCN populations and sugar beet yield through laboratory, greenhouse, and microplot experiments.

Recent studies at Michigan State University evaluated nine organic amendments (Layer Ash Blend, Worm Doo, Swine manure, Retail Dairy Doo, High Carbon Dairy Doo, Poultry manure, Sili-K, Seed Starter 101, and Layer Manure) for BCN management and sugar beet production improvement. Lab trials showed poultry manure and Layer Manure significantly reduced BCN egg hatching by over 98%. Greenhouse experiments confirmed these results, with both amendments decreasing cyst populations by more than 98% compared to untreated controls. Microplot trials demonstrated organic amendments improved multiple aspects of sugar beet production. Layer Ash Blend and swine manure reduced BCN populations by 38.67% at harvest when applied at 20 tons/ha. Poultry manure increased beet weight by 190% at 20 tons/ha application rate, while Layer Manure improved yields by 122%. Most amendments increased sugar content, with Worm Doo showing the highest improvement (20.75% Brix vs. 16.95% in controls). Additionally, poultry manure significantly increased beneficial nematode populations, indicating improved soil biological activity.

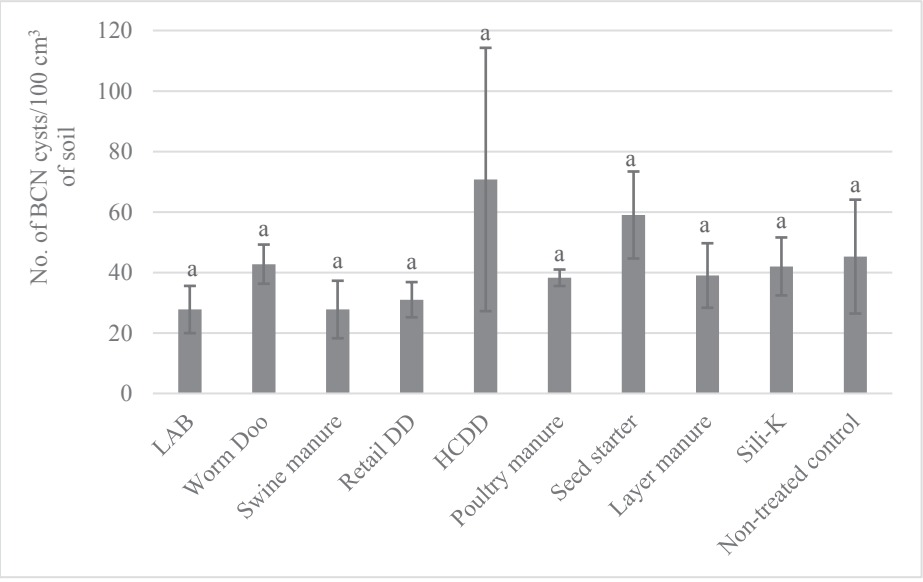

Figure 1. Effects of compost and manure treatments on BCN cyst numbers in sugar beet plants under microplot conditions. BCN cyst numbers were measured after 3 months in 100 cm³ soil at a 20 t/ha application rate. Different letters denote significant differences (Tukey's HSD, $p \leq 0.05$).

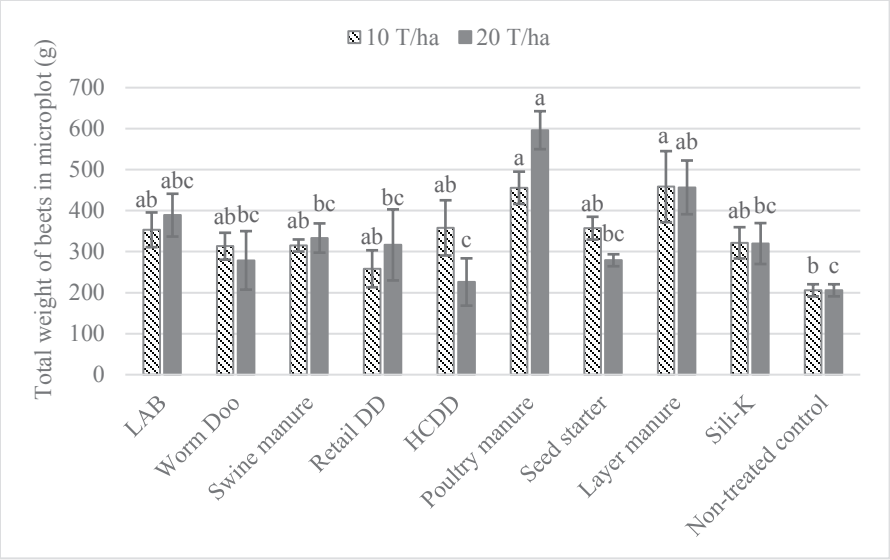

Figure 2. Effects of compost and manure treatment rates on the total weight of sugar beets in microplot field conditions. Mean (± SE) sugar beet yield (grams) was measured after 3 months of planting at 10 t/ha and 20 t/ha application rate. Different letters indicate significant differences between treatments according to Tukey's HSD test at $p \leq 0.05$.

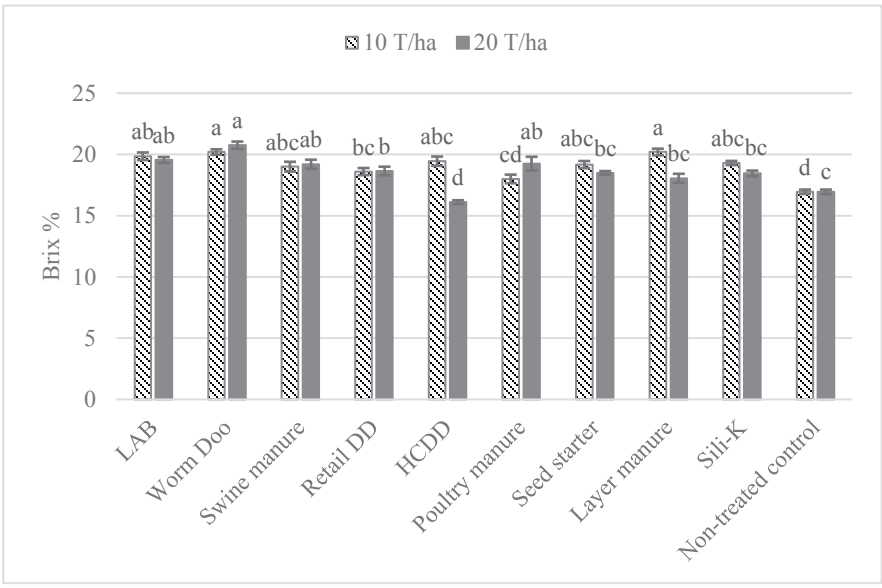

Figure 3. Effects of compost and manure treatment rates on brix percentage of sugar beets in microplot field conditions. Mean (± SE) sugar beet Brix percentage was measured after 3 months of planting at 10 t/ha and 20 t/ha application rate. Different letters indicate significant differences between treatments according to Tukey's HSD test at $p \leq 0.05$.

Product selection should be based on specific goals: poultry manure or Layer Manure provide maximum BCN control, Layer Ash Blend or Retail Dairy Doo offer balanced benefits, and Worm Doo excels at improving sugar content. All selections should consider soil test results and cost factors.

Organic amendments provide multiple benefits including long-term soil improvement, reduced chemical input costs, potential yield premium through improved sugar content, and additional nutrient value.

Research Support

This work was supported by Morgan Composting Inc., ACH Seeds, Michigan Sugar Company, and USDA-NIFA.

Nitrogen Application Strategies Trial

Blumfield West - Richville, MI - 2024

Trial Quality: Good
Variety: C-G227
Planted: May 6
Harvested: October 9
Plots: 6 rows X 38 ft., 4 reps
Row Spacing: 22 in.

Soil Info: Clay Loam
% OM: 2.4 **pH:** 7.6 **CEC:** 12.7
P: Very High **K:** High
Mn: High **B:** Medium
Added N: See Individual Treatments
Previous Crop: Wheat/Raddish

Rhizoc Level: Low
Cerc Control: Good
Problems: None
Seeding Rate: 4.1 in.
Rainfall: 15.10 in.
Beets/100 ft: 233

Application: Pre-plant was applied broadcast. 2X2 was applied with the planter. 6 and 12 lf applications were applied as a fluted coulter application or streamed on with a sprayer.

No.	Treatment	Rate/A	Applic Timing	Applic Method	Vigor**** 0-10 4-Oct	RWST	Net $/A	RWSA	T/A	% SUC	% CJP
1	Untreated				5.5	260	$1,181	5888	22.6	18.6	92.5
	Azteroid FC 3.3 Mustang Maxx	6.3 fl oz 4 fl oz	At Plant	In-Furr							
2	Nitrogen	160 lbs	May 5th	PPI	6.0	**274**	**$1,701**	**8297**	30.3	**18.8**	**94.1**
	Azteroid FC 3.3 Mustang Maxx	6.3 fl oz 4 fl oz	At Plant	In-Furr							
3	Nitrogen	120 lbs	May 5th	PPI	**6.8**	**274**	**$1,824**	**8962**	**32.7**	**18.8**	**94.0**
	Nitrogen*	40 lbs	At Plant	2X2							
	Azteroid FC 3.3 Mustang Maxx	6.3 fl oz 4 fl oz	At Plant	In-Furr							
4	Nitrogen	60 lbs	May 5th	PPI	6.0	**271**	$1,571	7779	28.7	**18.7**	**94.0**
	Nitrogen*	40 lbs	At Plant	2X2							
	Azteroid FC 3.3 Mustang Maxx	6.3 fl oz 4 fl oz	At Plant	In-Furr							
	Nitrogen + Anvol	60 lbs + 2.64 fl oz	6 lf***	Streamer							
5	Nitrogen*	40 lbs	At Plant	2X2	5.8	258	**$1,667**	**8433**	**32.7**	18.6	92.1
	Azteroid FC 3.3 Mustang Maxx	6.3 fl oz 4 fl oz	At Plant	In-Furr							
	Nitrogen + Anvol	60 lbs + 2.64 fl oz	6 lf***	Streamer							
	Nitrogen + Anvol	60 lbs + 2.64 fl oz	12 lf***	Streamer							
6	Nitrogen*	40 lbs	At Plant	2X2	**6.3**	262	**$1,750**	**8769**	**33.4**	18.5	**93.1**
	Azteroid FC 3.3 Mustang Maxx	6.3 fl oz 4 fl oz	At Plant	In-Furr							
	Nitrogen + Anvol	120 lbs + 5.12 fl oz	6 lf***	Streamer							
7	Nitrogen	60 lbs	May 5th	PPI	**6.3**	**274**	**$1,729**	**8503**	**31.0**	**19.0**	**93.6**
	Nitrogen*	40 lbs	At Plant	2X2							
	Azteroid FC 3.3 Mustang Maxx	6.3 fl oz 4 fl oz	At Plant	In-Furr							
	Nitrogen + Anvol	60 lbs + 2.64 fl oz	6 lf***	Fluted Coulter							

***Treatment includes Sulfur (Thio-Sul, 4 gal) + Phosphorus (10-34-0, 6 gal)**

****Treatment includes Sulfur (Thio-sul, 4 gal)**

***** 6 lf applications and 12 lf application dates: 6/12 and 7/1**

******Vigor** 0 to 10 ratings, 10 is the best

$/A: Payment calculated using early delivery adjustment where necessary, and the new quality payment minus fungicide and application cost.

Bold: Results are not statistically different from top-ranking treatment in each column.

Nitrogen Application Strategies Trial

Blumfield West - Richville, MI - 2024

No.	Treatment	Rate/A	Applic Timing	Applic Method	Vigor**** 0-10 4-Oct	RWST	Net $/A	RWSA	T/A	% SUC	% CJP
8	Nitrogen*	40 lbs	At Plant	2X2	5.5	**268**	**$1,761**	**8736**	**32.6**	**18.9**	93.0
	Azteroid FC 3.3 Mustang Maxx	6.3 fl oz 4 fl oz	At Plant	In-Furr							
	Nitrogen + Anvol	120 lbs + 5.12 fl oz	6 lf***	Fluted Coulter							
9	Nitrogen*	40 lbs	At Plant	2X2	**7.0**	263	**$1,703**	**8526**	**32.4**	18.6	92.9
	Azteroid FC 3.3 Mustang Maxx	6.3 fl oz 4 fl oz	At Plant	In-Furr							
	Nitrogen + Anvol	120 lbs + 5.12 fl oz	12 lf***	Streamer							
10	Azteroid FC 3.3 Mustang Maxx	6.3 fl oz 4 fl oz	At Plant	In-Furr	**6.8**	**273**	**$1,680**	**8228**	30.1	18.6	**94.6**
	Nitrogen + Anvol**	160 lbs + 6.57 fl oz	6 lf***	Streamer							
11	Azteroid FC 3.3 Mustang Maxx	6.3 fl oz 4 fl oz	At Plant	In-Furr	**6.3**	263	**$1,691**	**8419**	**32.0**	18.4	**93.2**
	Nitrogen + Anvol**	160 lbs + 6.57 fl oz	6 lf***	Fluted Coulter							
12	Nitrogen*	40 lbs	At Plant	2X2	5.0	**274**	$1,466	7164	26.2	**18.7**	**94.3**
	Azteroid FC 3.3 Mustang Maxx	6.3 fl oz 4 fl oz	At Plant	In-Furr							
13	Nitrogen**	60 lbs	May 5th	PPI	**6.5**	**271**	**$1,735**	**8569**	**31.6**	**18.9**	**93.5**
	Azteroid FC 3.3 Mustang Maxx	6.3 fl oz 4 fl oz	At Plant	In-Furr							
	Nitrogen + Anvol	100 lbs + 4.26 fl oz	6 lf***	Streamer							
14	Nitrogen**	40 lbs	May 5th	PPI	5.8	**269**	**$1,780**	**8798**	**32.7**	**18.8**	**93.5**
	Azteroid FC 3.3 Mustang Maxx	6.3 fl oz 4 fl oz	At Plant	In-Furr							
	Nitrogen + Anvol	60 lbs + 2.64 fl oz	6 lf***	Streamer							

***Treatment includes Sulfur (Thio-Sul, 4 gal) + Phosphorus (10-34-0, 6 gal)**

****Treatment includes Sulfur (Thio-sul, 4 gal)**

***** 6 lf applications and 12 lf application dates: 6/12 and 7/1**

******Vigor** 0 to 10 ratings, 10 is the best

$/A: Payment calculated using early delivery adjustment where necessary, and the new quality payment minus fungicide and application cost.

Bold: Results are not statistically different from top-ranking treatment in each column.

Nitrogen Application Strategies Trial

Blumfield West - Richville, MI - 2024

No.	Treatment	Rate/A	Applic Timing	Applic Method	Vigor**** 0-10 4-Oct	RWST	Net $/A	RWSA	T/A	% SUC	% CJP
15	Nitrogen	80 lbs	May 5th	PPI	5.0	**277**	$1,560	7612	27.5	**19.1**	**94.0**
	Azteroid FC 3.3 Mustang Maxx	6.3 fl oz 4 fl oz	At Plant	In-Furr							
16	Nitrogen	80 lbs	May 5th	PPI	5.8	**271**	$1,556	7669	28.2	18.6	**94.3**
	Nitrogen*	40 lbs	At Plant	2X2							
	Azteroid FC 3.3 Mustang Maxx	6.3 fl oz 4 fl oz	At Plant	In-Furr							
17	Nitrogen	80 lbs	May 5th	PPI	5.3	258	$1,579	7990	**31.0**	18.3	92.9
	Nitrogen*	40 lbs	At Plant	2X2							
	Azteroid FC 3.3 Mustang Maxx	6.3 fl oz 4 fl oz	At Plant	In-Furr							
	Nitrogen + Anvol	40 lbs + 1.68 fl oz	6 lf***	Streamer							
Average					6.0	268	$1,643	8138	30.3	18.7	93.5
LSD 5%					0.9	10.2	187.8	841.8	2.7	0.4	1.5
CV%					10.3	2.7	8.0	7.3	6.2	1.7	1.1

***Treatment includes Sulfur (Thio-Sul, 4 gal) + Phosphorus (10-34-0, 6 gal)**

****Treatment includes Sulfur (Thio-sul, 4 gal)**

***** 6 lf applications and 12 lf application dates: 6/12 and 7/1**

******Vigor** 0 to 10 ratings, 10 is the best

Comments: This trial is designed to examine nitrogen application strategies. Nitrogen was applied as 28% UAN in most cases, unless noted differently above.

$/A: Payment calculated using early delivery adjustment where necessary, and the new quality payment minus fungicide and application cost.

Bold: Results are not statistically different from top-ranking treatment in each column.

N & K Fertility Trial Early Harvest

Blumfield East - Richville, MI - 2024

Trial Quality: Good
Variety: C-G233
Planted: May 6
Harvested: September 12
Plots: 6 rows X 38 ft., 4 reps
Row Spacing: 22 in.
Application: 2X2 on planter.

Soil Info: Clay Loam
% OM: 2.6 **pH:** 8 **CEC:** 15.3
P: High **K:** Very High
Mn: High **B:** High
Added N: See Individual Treatments
Previous Crop: Wheat/Clover

Rhizoc Level: Low
Cerc Control: Good
Problems: None
Seeding Rate: 4.1 in.
Rainfall: 14.34 in.
Beets/100 ft: 230

No.	Treatment***	Rate/A	Applic Timing	Applic Method	Vigor**** 0-10 13-Jun	RWST	Net $/A	RWSA	T/A	% SUC	% CJP
1	Untreated Check				7.8	217	$770	3484	15.8	14.3	**97.5**
2	Nitrogen*	40 lbs	At Plant	2X2	7.5	**229**	$951	4225	18.3	**14.9**	**97.7**
3	Potassium	150 lbs	May 5th	PPI	7.8	**235**	$1,070	4779	20.2	**15.8**	**95.9**
	Nitrogen*	40 lbs	At Plant	2X2							
4	Potassium	300 lbs	May 5th	PPI	7.9	**244**	$1,094	4879	19.8	**15.6**	**98.4**
	Nitrogen*	40 lbs	At Plant	2X2							
5	Nitrogen*	40 lbs	At Plant	2X2	**8.3**	**236**	$1,173	5172	21.9	**15.2**	**98.2**
	Nitrogen + Anvol	40 lbs + 1.68 fl oz	6 lf	Streamer							
6	Potassium	150 lbs	May 5th	PPI	**8.0**	**250**	$1,121	4907	19.6	**16.1**	**98.0**
	Nitrogen*	40 lbs	At Plant	2X2							
	Nitrogen + Anvol	40 lbs + 1.68 fl oz	6 lf	Streamer							
7	Potassium	300 lbs	May 5th	PPI	**8.0**	**239**	**$1,264**	5698	23.8	**15.6**	**97.4**
	Nitrogen*	40 lbs	At Plant	2X2							
	Nitrogen + Anvol	40 lbs + 1.68 fl oz	6 lf	Streamer							
8	Nitrogen*	40 lbs	At Plant	2X2	7.6	206	$927	4415	21.3	13.7	**96.8**
	Nitrogen + Anvol	120 lbs	6 lf	Streamer							
9	Potassium	150 lbs	May 5th	PPI	7.5	225	$1,181	5480	24.6	14.6	**97.7**
	Nitrogen*	40 lbs	At Plant	2X2							
	Nitrogen + Anvol	120 lbs + 5.12 fl oz	6 lf	Streamer							
10	Potassium	300 lbs	May 5th	PPI	7.9	219	**$1,224**	**5802**	**26.5**	14.7	**96.2**
	Nitrogen*	40 lbs	At Plant	2X2							
	Nitrogen + Anvol	120 lbs + 5.12 fl oz	6 lf	Streamer							
11	Nitrogen*	40 lbs	At Plant	2X2	**8.1**	204	$947	4555	22.3	14.1	95.0
	Nitrogen + Anvol	160 lbs + 6.57 fl oz	6 lf	Streamer							
12	Potassium	150 lbs	May 5th	PPI	**8.0**	**238**	**$1,232**	5546	23.3	**15.5**	**97.6**
	Nitrogen*	40 lbs	At Plant	2X2							
	Nitrogen + Anvol	160 lbs + 6.57 fl oz	6 lf	Streamer							
13	Potassium	300 lbs	May 5th	PPI	**8.3**	**238**	**$1,488**	**6738**	**28.3**	**15.3**	**98.0**
	Nitrogen*	40 lbs	At Plant	2X2							
	Nitrogen + Anvol	160 lbs + 6.57 fl oz	6 lf	Streamer							
Average					7.9	229.2	$1,111	5052	22.0	15.0	97.3
LSD 5%					0.3	22.3	264.6	999.7	3.3	1.2	2.5
CV%					3.0	6.8	16.6	13.8	10.5	5.4	1.8

***Treatment includes Sulfur (Thio-Sul, 4 gal) + Phosphorus (10-34-0, 6 gal)**

Conversions: 150 lbs of actual potassium (250 lbs Potash), 300 lbs potassium (500 lbs Potash). 40 lbs of actual nitrogen (13 gal/A UAN 28%), 60 lbs N (20 gal/A UAN 28%), 120 lbs N (40 gal/A UAN 28%), 160 lbs N (53 gal/A UAN 28%).

****6 lf Application date: 6/12**

***** All treatments included Azteroid FC 3.3 @ 6.3 fl oz and Mustang Maxx @ 4 fl oz - In-Furrow**

******Vigor** 0 to 10 ratings, 10 is the best

Comments: This trial compared nitrogen and potassium rates and the impact on yield and sugar when harvested early in the season.

$/A: Payment calculated using early delivery adjustment where necessary, and the new quality payment minus fungicide and application cost.

Bold: Results are not statistically different from top-ranking treatment in each column.

N & K Fertility Trial Late Harvest

Blumfield East - Richville, MI - 2024

Trial Quality: Good
Variety: C-G233
Planted: May 6
Harvested: October 8
Plots: 6 rows X 38 ft., 4 reps
Row Spacing: 22 in.
Application: 2X2 on planter.

Soil Info: Clay Loam
% OM: 2.6 **pH:** 8 **CEC:** 15.3
P: High **K:** Very High
Mn: High **B:** High
Added N: See Individual Treatments
Previous Crop: Wheat/Clover

Rhizoc Level: Low
Cerc Control: Good
Problems: None
Seeding Rate: 4.1 In.
Rainfall: 15.09 in.
Beets/100 ft: 238

No.	Treatment***	Rate/A	Applic Timing	Applic Method	Vigor**** 0-10 13-Jun	RWST	Net $/A	RWSA	T/A	% SUC	% CJP
1	Untreated Check				7.9	**286**	$966	4623	16.1	**18.8**	**96.2**
2	Nitrogen*	40 lbs	At Plant	2X2	8.3	**288**	$1,148	5494	19.1	**18.9**	**96.3**
3	Potassium	150 lbs	May 5th	PPI	7.8	**294**	$1,165	5618	19.1	**19.2**	**96.6**
	Nitrogen*	40 lbs	At Plant	2X2							
4	Potassium	300 lbs	May 5th	PPI	7.8	**296**	$1,194	5840	19.8	**19.2**	**96.9**
	Nitrogen*	40 lbs	At Plant	2X2							
5	Nitrogen*	40 lbs	At Plant	2X2	8.0	**287**	$1,547	7433	25.9	**19.0**	95.8
	Nitrogen + Anvol	40 lbs + 1.68 fl oz	6 lf**	Streamer							
6	Potassium	150 lbs	May 5th	PPI	7.9	**286**	$1,373	6715	23.5	**18.9**	96.1
	Nitrogen*	40 lbs	At Plant	2X2							
	Nitrogen + Anvol	40 lbs + 1.68 fl oz	6 lf**	Streamer							
7	Potassium	300 lbs	May 5th	PPI	7.9	**293**	$1,503	7339	25.0	**19.3**	**96.2**
	Nitrogen*	40 lbs	At Plant	2X2							
	Nitrogen + Anvol	40 lbs + 1.68 fl oz	6 lf**	Streamer							
8	Nitrogen*	40 lbs	At Plant	2X2	8.1	273	**$1,810**	**8902**	**32.7**	18.5	94.8
	Nitrogen + Anvol	120 lbs + 5.12 fl oz	6 lf**	Streamer							
9	Potassium	150 lbs	May 5th	PPI	7.8	282	$1,332	6577	23.3	**18.9**	95.2
	Nitrogen*	40 lbs	At Plant	2X2							
	Nitrogen + Anvol	120 lbs + 5.12 fl oz	6 lf**	Streamer							
10	Potassium	300 lbs	May 5th	PPI	7.9	**293**	**$1,859**	**9058**	**30.9**	**19.4**	95.7
	Nitrogen*	40 lbs	At Plant	2X2							
	Nitrogen + Anvol	120 lbs +5.12 fl oz	6 lf**	Streamer							
11	Nitrogen*	40 lbs	At Plant	2X2	7.9	270	$1,595	7906	**29.3**	18.2	95.0
	Nitrogen + Anvol	160 lbs + 6.57 fl oz	6 lf**	Streamer							
12	Potassium	150 lbs	May 5th	PPI	8.1	**293**	**$1,688**	**8183**	27.9	**19.5**	95.5
	Nitrogen*	40 lbs	At Plant	2X2							
	Nitrogen + Anvol	160 lbs + 6.57 fl oz	6 lf**	Streamer							
13	Potassium	300 lbs	May 5th	PPI	7.8	**289**	**$1,709**	**8413**	**29.1**	**19.4**	95.1
	Nitrogen*	40 lbs	At Plant	2X2							
	Nitrogen + Anvol	160 lbs + 6.57 fl oz	6 lf**	Streamer							
Average					7.9	287	$1,453	7085	24.7	19.0	95.8
LSD 5%					N.S.	12.5	247.0	1137.5	3.8	0.7	0.7
CV%					4.0	3.1	11.9	11.2	10.8	2.6	0.5

***Treatment includes Sulfur (Thio-Sul, 4 gal) + Phosphorus (10-34-0, 6 gal)**

Conversions: 150 lbs of actual potassium (250 lbs Potash), 300 lbs potassium (500 lbs Potash). 40 lbs of actual nitrogen (13 gal/A UAN 28%), 60 lbs N (20 gal/A UAN 28%), 120 lbs N (40 gal/A UAN 28%), 160 lbs N (53 gal/A UAN 28%).

**** 6 lf Application Date: 6/12**

***** All treatments included Azteroid FC 3.3 @ 6.3 fl oz and Mustang Maxx @ 4 fl oz - In-Furrow**

******Vigor** 0 to 10 ratings, 10 is the best

Comments: This trial compared nitrogen and potassium rates and the impact on yield and sugar when harvested late in the season.

$/A: Payment calculated using early delivery adjustment where necessary, and the new quality payment minus fungicide and application cost.

Bold: Results are not statistically different from top-ranking treatment in each column.

Nitrogen Rates - PPI

Gruehn - Pigeon, MI - 2024

Trial Quality: Good
Variety: C-G229, C-G233
Planted: May 9
Harvested: September 30
Plots: 6 rows X 38 ft., 4 reps
Row Spacing: 22 in.

Soil Info: Sandy Loam
% OM: 2.5 **pH:** 7.5 **CEC:** 13
P: Very High **K:** Very High
Mn: High **B:** Medium
Added N: See Individual Treatments
Previous Crop: Corn

Rhizoc Level: Low
Cerc Control: Good
Problems: None
Seeding Rate: 4.1 in.
Rainfall: 12.34 in.
Beets/100 ft: 236

Application: Pre-plant was applied broadcast. 2X2 was applied with the planter. 6 and 12 lf applications were applied as a fluted coulter application or streamed on with a sprayer.

No.	Variety	Treatment**	Rate/A	Applic Timing	Applic Method	Vigor**** 0-10 27-Jun	RWST	Net $/A	RWSA	T/A	% SUC	% CJP
1	C-G229	Untreated Check				6.6	254	$730	3522	13.7	17.0	**97.4**
2	C-G233	Untreated Check				6.0	232	$636	3179	13.3	15.9	**96.9**
3	C-G229	Nitrogen	40 lbs	PPI*	2X2	6.9	274	$1,119	5237	18.9	18.2	**97.4**
4	C-G233	Nitrogen	40 lbs	PPI*	2X2	**7.1**	253	$901	4397	17.4	16.8	**96.8**
5	C-G229	Nitrogen	40 lbs	PPI*	2X2	**7.1**	**292**	**$1,425**	**6546**	22.3	**18.7**	**97.6**
		Nitrogen + Anvol	40 lbs + 1.68 fl oz	6 lf***	Streamer							
6	C-G233	Nitrogen	40 lbs	PPI*	2X2	6.9	254	$1,122	5444	21.1	17.3	**96.3**
		Nitrogen + Anvol	40 lbs + 1.68 fl oz	6 lf***	Streamer							
7	C-G229	Nitrogen	40 lbs	PPI*	2X2	**7.3**	**284**	**$1,456**	**6783**	**23.8**	**18.7**	**96.4**
		Nitrogen + Anvol	80 lbs + 3.36 fl oz	6 lf***	Streamer							
8	C-G233	Nitrogen	40 lbs	PPI*	2X2	**7.5**	273	**$1,377**	**6532**	**24.0**	17.8	**96.1**
		Nitrogen + Anvol	80 lbs + 3.36 fl oz	6 lf***	Streamer							
9	C-G229	Nitrogen	40 lbs	PPI*	2X2	**7.6**	**301**	**$1,788**	**8156**	**27.1**	**19.6**	**96.4**
		Nitrogen + Anvol	120 lbs + 5.12 fl oz	6 lf***	Streamer							
10	C-G233	Nitrogen	40 lbs	PPI*	2X2	**7.5**	266	**$1,470**	**7042**	**26.4**	17.6	95.0
		Nitrogen + Anvol	120 lbs + 5.12 fl oz	6 lf***	Streamer							

***PPI: Incorporated on May 9**

**** All Treatments included Azteroid FC 3.3 @ 6.3 fl oz + Mustang Maxx @ 4 fl oz In-Furrow**

***** 6 lf application date: 6/14**

******Vigor** 0 to 10 ratings, 10 is the best

$/A: Payment calculated using early delivery adjustment where necessary, and the new quality payment minus fungicide and application cost.

Bold: Results are not statistically different from top-ranking treatment in each column.

Nitrogen Rates - PPI

Gruehn - Pigeon, MI - 2024

No.	Variety	Treatment**	Rate/A	Applic Timing	Applic Method	Vigor**** 0-10 27-Jun	RWST	Net $/A	RWSA	T/A	% SUC	% CJP
11	C-G229	Nitrogen	40 lbs	PPI*	2X2	**8.0**	**287**	**$1,707**	**7933**	**27.5**	**18.8**	**96.5**
		Nitrogen + Anvol	160 lbs + 6.57 oz	6 If***	Streamer							
12	C-G233	Nitrogen	40 lbs	PPI*	2X2	**7.5**	274	**$1,548**	**7348**	**26.8**	17.9	95.8
		Nitrogen + Anvol	160 lbs + 6.57 oz	6 If***	Streamer							
13	C-G229	Nitrogen	40 lbs	PPI*	2X2	**7.5**	**283**	**$1,651**	**7742**	**27.3**	**18.9**	95.4
		Nitrogen + Anvol	200 lbs + 8.52 oz	6 If***	Streamer							
14	C-G229	Nitrogen	40 lbs	PPI*	2X2	**7.1**	265	**$1,549**	**7454**	**28.0**	18.2	93.4
		Nitrogen + Anvol	200 lbs + 8.52 oz	6 If***	Streamer							
Average						7.2	271	$1,320	6237	22.7	18.0	96.2
LSD 5%						1.0	19.7	414.5	1808.6	5.6	0.9	1.6
CV%						9.6	5.1	22.0	20.3	17.2	3.7	1.2

***PPI: Incorporated on may 9**

**** All Treatments include Azteroid FC 3.3 @ 6.3 fl oz + Mustang Maxx @ 4 fl oz In-Furrow**

***** 6 If application date: 6/14**

******Vigor** 0 to 10 ratings, 10 is the best

Comments: This trial is designed to examine nitrogen application strategies and 2 varities. C-G229 ia a high sugar variety. C-G233 is a higher tonnage variety.

$/A: Payment calculated using early delivery adjustment where necessary, and the new quality payment minus fungicide and application cost.

Bold: Results are not statistically different from top-ranking treatment in each column.

Nitrogen Rates Early Harvest

Blumfield West - Richville, MI - 2024

Trial Quality: Good
Variety: C-G229 , C-G233
Planted: May 6
Harvested: August 28
Plots: 6 rows X 38 ft., 4 reps
Row Spacing: 22 in.

Soil Info: Clay Loam
% OM: 2.4 **pH:** 7.6 **CEC:** 12.7
P: Very High **K:** High
Mn: High **B:** Medium
Added N: See Individual Treatments
Previous Crop: Wheat/Raddish

Rhizoc Level: Low
Cerc Control: Good
Problems: None
Seeding Rate: 4.1 in.
Rainfall: 14.15 in.
Beets/100 ft: 262

Application: Pre-plant was applied broadcast. 2X2 was applied with the planter. 6 and 12 lf applications were applied as a fluted coulter application or streamed on with a sprayer.

No.	Variety	Treatment*	Rate/A	Applic Timing	Applic Method	Vigor**** 0-10 13-Jun	RWST	Net $/A	RWSA	T/A	% SUC	% CJP
1	C-G229	Untreated Check				6.9	**269**	$1,286	4553	17.0	**17.2**	**98.3**
2	C-G233	Untreated Check				**7.6**	**247**	$1,378	5019	20.3	**15.9**	**98.1**
3	C-G229	Nitrogen**	N - 40 lbs	At Plant	2x2	**7.9**	**254**	$1,407	5085	20.0	**16.4**	**97.9**
4	C-G233	Nitrogen**	N - 40 lbs	At Plant	2x2	**7.5**	233	$1,303	4865	20.8	15.5	96.5
5	C-G229	Nitrogen**	N - 40 lbs	At Plant	2x2	7.0	**253**	**$1,803**	6539	25.8	**16.3**	**98.0**
		Nitrogen + Anvol	N - 40 lbs + 1.68 fl oz	6 lf***	Streamer							
6	C-G233	Nitrogen**	N - 40 lbs	At Plant	2x2	**7.5**	241	**$1,817**	**6707**	27.8	15.5	**98.0**
		Nitrogen + Anvol	N - 40 lbs + 1.68 fl oz	6 lf***	Streamer							
7	C-G229	Nitrogen**	N - 40 lbs	At Plant	2x2	**7.8**	**256**	**$1,955**	**7073**	27.6	**16.3**	**98.5**
		Nitrogen + Anvol	N - 80 lbs + 3.36 fl oz	6 lf***	Streamer							
8	C-G233	Nitrogen**	N - 40 lbs	At Plant	2x2	**7.4**	237	**$1,885**	**7011**	29.5	15.5	97.2
		Nitrogen + Anvol	N - 80 lbs + 3.36 fl oz	6 lf***	Streamer							
9	C-G229	Nitrogen**	N - 40 lbs	At Plant	2x2	**7.4**	223	$1,690	6468	28.9	14.4	**98.3**
		Nitrogen + Anvol	N - 120 lbs + 5.04 fl oz	6 lf***	Streamer							
10	C-G233	Nitrogen**	N - 40 lbs	At Plant	2x2	**7.5**	241	**$2,026**	**7505**	**31.2**	15.5	**98.2**
		Nitrogen + Anvol	N - 120 lbs + 5.04 fl oz	6 lf***	Streamer							

*** Treatments include Azteroid FC 3.3 @ 6.3 fl oz and Mustang Maxx @ 4 fl oz In-Furrow**

**** Nitrogen includes Sulfur (Thio-Sul, 4 gal) + Phosphorus (10-34-0, 6 gal)**

***** 6 lf application date: 6/12**

******Vigor** 0 to 10 ratings, 10 is the best

$/A: Payment calculated using early delivery adjustment where necessary, and the new quality payment minus fungicide and application cost.

Bold: Results are not statistically different from top-ranking treatment in each column.

Nitrogen Rates Early Harvest

Blumfield West - Richville, MI - 2024

No.	Variety	Treatment*	Rate/A	Applic Timing	Applic Method	Vigor**** 0-10 13-Jun	RWST	Net $/A	RWSA	T/A	% SUC	% CJP
11	C-G229	Nitrogen**	N - 40 lbs	At Plant	2x2	**7.8**	238	**$1,829**	**6823**	28.6	15.4	**97.9**
		Nitrogen + Anvol	N - 160 lbs + 6.72 fl oz	6 lf***	Streamer							
12	C-G233	Nitrogen**	N - 40 lbs	At Plant	2x2	**7.4**	237	**$1,969**	**7351**	**31.0**	15.6	97.0
		Nitrogen + Anvol	N - 160 lbs + 6.72 fl oz	6 lf***	Streamer							
13	C-G229	Nitrogen**	N - 40	At Plant	2x2	**7.5**	229	**$1,796**	**6846**	**30.1**	15.0	**97.3**
		Nitrogen + Anvol	N - 200 lbs + 8.4 fl oz	6 lf***	Streamer							
14	C-G233	Nitrogen**	N - 40 lbs	At Plant	2x2	7.0	229	**$1,933**	**7336**	**32.0**	15.4	96.1
		Nitrogen + Anvol	N - 200 lbs + 8.4 fl oz	6 lf***	Streamer							
Average						7.4	242	$1,720	6370	26.5	15.7	97.7
LSD 5%						0.7	24.7	308.7	899.4	2.1	1.5	1.2
CV						6.5	7.1	12.6	9.9	5.6	6.7	0.8

*** Treatments include Azteroid FC 3.3 @ 6.3 fl oz and Mustang Maxx @ 4 fl oz In-Furrow**

**** Nitrogen includes Sulfur (Thio-Sul, 4 gal) + Phosphorus (10-34-0, 6 gal)**

***** 6 lf application date: 6/12**

******Vigor** 0 to 10 ratings, 10 is the best

Comments: This trial is designed to examine nitrogen application strategies and 2 varities. C-G229 ia a high sugar variety. C-G233 is a higher tonnage variety.

$/A: Payment calculated using early delivery adjustment where necessary, and the new quality payment minus fungicide and application cost.

Bold: Results are not statistically different from top-ranking treatment in each column.

Nitrogen Rates Late Harvest

Blumfield West - Richville, MI - 2024

Trial Quality: Good
Variety: C-G229 , C-G233
Planted: May 6
Harvested: October 9
Plots: 6 rows X 38 ft., 4 reps
Row Spacing: 22 in.

Soil Info: Clay Loam
% OM: 2.4 **pH:** 7.6 **CEC:** 12.7
P: Very High **K:** High
Mn: High **B:** Medium
Added N: See Individual Treatments
Previous Crop: Wheat/Raddish

Rhizoc Level: Low
Cerc Control: Good
Problems: None
Seeding Rate: 4.1 in.
Rainfall: 15.09 in.
Beets/100 ft: 255

Application: Pre-plant was applied broadcast. 2X2 was applied with the planter. 6 and 12 lf applications were applied as a fluted coulter application or streamed on with a sprayer.

No.	Variety	Treatment*	Rate/A	Applic Timing	Applic Method	Vigor**** 0-10 4-Oct	RWST	Net $/A	RWSA	T/A	% SUC	% CJP
1	C-G229	Untreated Check				6.3	**294**	$1,296	6163	21.0	**19.4**	**95.9**
2	C-G233	Untreated Check				6.3	285	$1,265	6079	21.3	18.8	**96.2**
3	C-G229	Nitrogen**	40 lbs	At Plant	2x2	6.3	**293**	$1,390	6629	22.6	**19.3**	**96.1**
4	C-G233	Nitrogen**	40 lbs	At Plant	2x2	6.3	287	$1,295	6223	21.6	18.7	**96.6**
5	C-G229	Nitrogen**	40 lbs	At Plant	2x2	6.5	**298**	**$1,782**	**8466**	28.4	**19.7**	**96.0**
		Nitrogen + Anvol	40 lbs + 1.68 fl oz	6 lf***	Streamer							
6	C-G233	Nitrogen**	40 lbs	At Plant	2x2	**7.0**	283	**$1,683**	**8155**	**28.8**	18.8	95.6
		Nitrogen + Anvol	40 lbs + 1.68 fl oz	6 lf***	Streamer							
7	C-G229	Nitrogen**	40 lbs	At Plant	2x2	5.8	**301**	**$1,782**	**8446**	28.0	**19.9**	**95.9**
		Nitrogen + Anvol	80 lbs + 3.36 fl oz	6 lf***	Streamer							
8	C-G233	Nitrogen**	40 lbs	At Plant	2x2	6.5	284	**$1,651**	8002	28.1	18.8	95.8
		Nitrogen + Anvol	80 lbs + 3.36 fl oz	6 lf***	Streamer							
9	C-G229	Nitrogen**	40 lbs	At Plant	2x2	6.0	**299**	**$1,841**	**8765**	**29.3**	**19.8**	**95.9**
		Nitrogen + Anvol	120 lbs + 5.12 fl oz	6 lf***	Streamer							
10	C-G233	Nitrogen**	40 lbs	At Plant	2x2	**6.8**	**292**	**$1,858**	**8924**	**30.5**	**19.4**	95.6
		Nitrogen + Anvol	120 lbs + 5.12 fl oz	6 lf***	Streamer							

*** Treatments include Azteroid FC 3.3 @ 6.3 fl oz and Mustang Maxx @ 4 fl oz In-Furrow**

****Treatment includes Sulfur (Thio-Sul, 4 gal) + Phosphorus (10-34-0, 6 gal)**

*****6 lf application: 6/12**

******Vigor** 0 to 10 ratings, 10 is the best

$/A: Payment calculated using early delivery adjustment where necessary, and the new quality payment minus fungicide and application cost.

Bold: Results are not statistically different from top-ranking treatment in each column.

Nitrogen Rates Late Harvest

Blumfield West - Richville, MI - 2024

No.	Variety	Treatment*	Rate/A	Applic Timing	Applic Method	Vigor**** 0-10 4-Oct	RWST	Net $/A	RWSA	T/A	% SUC	% CJP
11	C-G229	Nitrogen**	40 lbs	At Plant	2x2	6.5	**296**	**$1,784**	**8540**	**28.8**	**19.9**	95.1
		Nitrogen + Anvol	160 lbs + 6.57 fl oz	6 lf***	Streamer							
12	C-G233	Nitrogen**	40 lbs	At Plant	2x2	6.5	288	**$1,816**	**8784**	**30.5**	**19.2**	95.4
		Nitrogen + Anvol	160 + 6.57 fl oz	6 lf***	Streamer							
13	C-G229	Nitrogen**	40 lbs	At Plant	2x2	**6.8**	286	**$1,860**	**9043**	**31.7**	**19.2**	95.0
		Nitrogen + Anvol	200 lbs + 8.52 fl oz	6 lf***	Streamer							
14	C-G233	Nitrogen**	40 lbs	At Plant	2x2	**7.5**	285	**$1,835**	**8943**	**31.5**	19.0	95.4
		Nitrogen + Anvol	200 lbs + 8.52 fl oz	6 lf***	Streamer							

Average	6.5	291	$1,653	7940	27.3	19.3	95.7
LSD 5%	0.8	12.0	208.9	941.6	3.0	0.7	0.7
CV	8.7	2.9	8.8	8.3	7.8	2.6	0.5

*** Treatments include Azteroid FC 3.3 @ 6.3 fl oz and Mustang Maxx @ 4 fl oz In-Furrow**

****Treatment includes Sulfur (Thio-Sul, 4 gal) + Phosphorus (10-34-0, 6 gal)**

*****6 lf application: 6/12**

******Vigor** 0 to 10 ratings, 10 is the best

Comments: This trial is designed to examine nitrogen application strategies and 2 varities. C-G229 ia a high sugar variety. C-G233 is a higher tonnage variety.

$/A: Payment calculated using early delivery adjustment where necessary, and the new quality payment minus fungicide and application cost.

Bold: Results are not statistically different from top-ranking treatment in each column.

Ostara Crystal Green Trial

Blumfield West - Richville, MI - 2024

Trial Quality:
Variety: C-G227
Planted: May 6
Harvested: October 9
Plots: 6 rows X 38 ft., 4 reps
Row Spacing: 22 in.

Soil Info: Clay Loam
% OM: 2.4 **pH:** 7.6 **CEC:** 12.7
P: Very High **K:** High
Mn: High **B:** Medium
Added N: See Individual Treatments
Previous Crop: Wheat/Raddish

Rhizoc Level: Low
Cerc Control: Good
Problems: None
Seeding Rate: 4.1 in.
Rainfall: 15.10 in.
Beets/100 ft: 237

Application: Pre-plant was applied broadcast. 2X2 was applied with the planter. 6 and 12 lf applications were applied as a fluted coulter application or streamed on with a sprayer.

No.	Treatment	Rate/A	Applic Timing	Applic Method	Vigor** 0-10 4-Oct	RWST	Net $/A	RWSA	T/A	% SUC	% CJP
2	Nitrogen*	40 lbs	At Plant	2X2	6.3	**262**	**$1,621**	**8189**	**31.3**	18.5	**93.1**
	Azteroid FC 3.3 Mustang Maxx	6.3 fl oz 4 fl oz	At Plant	In-Furr							
	Nitrogen + Anvol	120 lbs + 5.12 fl oz	6-8 lf	Streamer							
3	Crystal Green	40 lbs	6-May	PPI	6.0	**272**	**$1,716**	**8553**	**31.5**	18.7	**94.1**
	Nitrogen*	40 lbs	At Plant	2X2							
	Azteroid FC 3.3 Mustang Maxx	6.3 fl oz 4 fl oz	At Plant	In-Furr							
	Nitrogen + Anvol	120 lbs + 5.12 fl oz	6-8 lf	Streamer							
1	Untreated Check				5.5	251	$1,031	5245	20.9	18.6	90.9
Average					5.9	262	$1,456	7329	27.9	18.6	92.7
LSD 5%					N.S.	13.8	207.1	1174.2	5.8	N.S.	2.9
CV %					15.2	3.1	8.2	9.3	12.1	1.8	1.8

***Treatment includes Sulfur (Thio-Sul, 4 gal) + Phosphorus (10-34-0, 6 gal)**

****Vigor** 0 to 10 ratings, 10 is the best

Comments: Crystal Green is a targeted release Phosphorus Fertilizer. Study was designed to compare the same rates of N P and S provided by Crystal Green compared to 10-34-0. The rates compared provided 24 lbs of P2O5 for each treatment.

$/A: Payment calculated using early delivery adjustment where necessary, and the new quality payment minus fungicide and application cost.

Bold: Results are not statistically different from top-ranking treatment in each column.

Phase II

Schlicker - Bay City, MI - 2024

Trial Quality: Good
Variety: C-G229
Planted: April 22
Harvested: October 15
Plots: 6 rows X 38 ft., 4 reps
Row Spacing: 22 in.

Soil Info: Clay Loam
% OM: 2.6 **pH:** 7.8 **CEC:** 15.5
P: Very High **K:** High
Mn: High **B:** High
Added N: 36 lbs. 2X2 + 250 lbs. Urea
Previous Crop: Corn

Rhizoc Level: Low
Problems: None
Seeding Rate: 4.1 in.
Rainfall: 16.22 in.
Beets/100 ft: 147

Application: JD 3520 tractor mounted plot sprayer, compressed air, 15.3 gpa - Foliar 7" band
Monosem 6-row Agronomy Planter, compressed air, 30 psi, 9 gpa - IF, 3.5' band

No.	Treatment	Rate/A	Applic Timing	Applic Method	RWST	Net $/A	RWSA	T/A	% SUC	% CJP	Beets/ 100 ft 2-Aug
1	Phase II 4-0-0	3 gal	24-Jun	Broadcast	304	**$1,998**	**9628**	**31.7**	19.2	98.4	138.1
	Phase II 4-0-0	3 gal	9-Jul	Broadcast							
2	Phase II 4-0-0	3 gal	24-Jun	Broadcast	299	**$1,927**	**9380**	**31.4**	19.0	98.0	147.8
	Phase II 4-0-0	6 gal	9-Jul	Broadcast							
3	Phase II (Research Blend)	3 gal	24-Jun	Broadcast	299	**$2,067**	**10019**	**33.5**	19.0	97.9	147.2
	Phase II (Research Blend)	3 gal	9-Jul	Broadcast							
5	Untreated Check				295	**$1,932**	**9337**	**31.7**	18.6	98.4	153.4
4	Phase II (Research Blend)	3 gal	24-Jun	Broadcast	294	$1,707	8373	28.5	18.9	97.4	149.4
	Phase II (Research Blend)	6 gal	9-Jul	Broadcast							
Average					298	$1,926	9347	31.4	18.9	98.0	147.2
LSD 5%					N.S.	182.4	808.1	2.7	N.S.	N.S.	N.S.
CV%					3.4	6.2	5.6	5.6	2.5	0.6	9.1

Comments: Phase II is a product designed to enhance yield and sugar content.

$/A: Payment calculated using early delivery adjustment where necessary, and the new quality payment minus fungicide and application cost.

Bold: Results are not statistically different from top-ranking treatment in each column.

Foliar CHS Plant Health

Gruehn - Pigeon, MI - 2024

Trial Quality: Good
Variety: BTS-1122
Planted: May 9
Harvested: September 27
Plots: 6 rows X 38 ft, 4 reps
Row Spacing: 22 in.

Soil Info: Sandy Loam
% OM: 2.5 **pH:** 7.5 **CEC:** 13
P: Very High **K:** Very High
Mn: High **B:** Medium
Added N: 36 lbs. 2X2, 100 lbs. Sidedress
Previous Crop: Corn

Rhizoc Level: Low
Cerc Control: Good
Problems: None
Seeding Rate: 4.1 in.
Rainfall: 12.31 in.
Beets/100 ft: 251

Application: JD 3520 tractor mounted plot sprayer, compressed air, 15.3 gpa - Foliar 7" band
Monosem 6-row Agronomy Planter, compressed air, 30 psi, 9 gpa - IF, 3.5" band

No.	Treatment	Rate/A	Applic Timing	Applic Method	RWST	Vigor* 0-10 27-Jun	Net $/A	RWSA	T/A	% SUC	% CJP
3	UAN 28% + 10-34-0 + Thio-Sul	8 gal + 6 gal + 4 gal	At Plant	2X2	267	8.1	$1,520	7132	26.8	17.8	95.9
	Azteroid 3.3 FC + Mustang Maxx	6.3 fl oz + 4 fl oz	At Plant	In-Fur							
	Boron 10% + WC-250	16 fl oz + 4.2 fl oz	21-Jun	Broadcast							
2	UAN 28% + 10-34-0 + Thio-Sul	8 gal + 6 gal + 4 gal	At Plant	2X2	262	8.2	$1,791	8443	**32.2**	17.6	95.5
	Azteroid 3.3 FC + Mustang Maxx	6.3 fl oz + 4 fl oz	At Plant	In-Fur							
	WC-250	4.2 fl oz	21-Jun	Broadcast							
4	UAN 28% + 10-34-0 + Thio-Sul	8 gal + 6 gal + 4 gal	At Plant	2X2	259	8.1	$1,485	7060	**27.3**	17.4	95.3
	Azteroid 3.3 FC + Mustang Maxx	6.3 fl oz + 4 fl oz	At Plant	In-Fur							
	WC-772 + WC-250	32 fl oz + 4.2 fl oz	21-Jun	Broadcast							
6	UAN 28% + 10-34-0 + Thio-Sul	8 gal + 6 gal + 4 gal	At Plant	2X2	257	7.9	$1,481	7053	**27.3**	17.3	95.3
	Azteroid 3.3 FC + Mustang Maxx	6.3 fl oz + 4 fl oz	At Plant	In-Fur							
	WC-596 + WC-250	32 fl oz + 4.2 fl oz	21-Jun	Broadcast							
1	UAN 28% + 10-34-0 + Thio-Sul	8 gal + 6 gal + 4 gal	At Plant	2X2	257	7.9	$1,506	7151	**27.8**	17.3	95.5
	Azteroid 3.3 FC + Mustang Maxx	6.3 fl oz + 4 fl oz	At Plant	In-Fur							
5	UAN 28% + 10-34-0 + Thio-Sul	8 gal + 6 gal + 4 gal	At Plant	2X2	257	7.8	$1,510	7194	**28.0**	17.2	95.6
	Azteroid 3.3 FC + Mustang Maxx	6.3 fl oz + 4 fl oz	At Plant	In-Fur							
	WC-597 + WC-250	16 fl oz + 4.2 fl oz	21-Jun	Broadcast							
Average					260	8.0	$1,549	7339	28.2	17.4	95.5
LSD 5%					N.S.	N.S.	N.S.	N.S.	5.0	N.S.	N.S.
CV%					5.3	6.0	18.4	16.6	13.5	5.1	0.8

***Vigor** 0 to 10 ratings, 10 is the best

Comments: This study was designed to test CHS plant health products for an improvement in sugar and yield.

$/A: Payment calculated using early delivery adjustment where necessary, and the new quality payment minus fungicide and application cost.

Bold: Results are not statistically different from top-ranking treatment in each column.

CHS Sidedress

Gruehn - Pigeon, MI - 2024

Trial Quality: Good
Variety: BTS-1122
Planted: May 9
Harvested: September 27
Plots: 6 rows X 38 ft., 4 reps
Row Spacing: 22 in.

Soil Info: Sandy Loam
% OM: 2.5 **pH:** 7.5 **CEC:** 13
P: Very High **K:** Very High
Mn: High **B:** Medium
Added N: 35 lbs PPI, 120 Sidedess
Previous Crop: Corn

Rhizoc Level: Low
Cerc Control: Good
Problems: None
Seeding Rate: 4.1 in.
Rainfall: 12.31 in.
Beets/100 ft: 231

Application: JD 3520 tractor mounted plot sprayer, compressed air, 15.3 gpa - Foliar 7" band
Monosem 6-row Agronomy Planter, compressed air, 30 psi, 9 gpa - IF, 3.5" band

No.	Treatment	Rate/A	Applic Timing/ Date	Applic Method	RWST	Vigor* 0-10 27-Jun	Net $/A	RWSA	T/A	% SUC	% PUR	B/100 8-Aug	B/100 20-Jun
3	UAN 28%	18 gal	9-May	PPI	260	7.8	$2,248	7124	27.4	17.3	96.1	232.2	253.3
	Azteroid 3.3 FC + Mustang	6.3 fl oz + 4 fl oz	At Plant	In-Fur									
	UAN 28% WC-597	17 gal 1 qt	6 lf	Streamer									
1	UAN 28%	18 gal	9-May	PPI	258	7.7	$2,094	6627	25.6	17.0	96.6	228.4	251.7
	Azteroid 3.3 FC + Mustang	6.3 fl oz + 4 fl oz	At Plant	In-Fur									
	UAN 28%	17 gal	6 lf	Streamer									
2	UAN 28%	18 gal	9-May	PPI	252	7.8	$2,130	6746	26.8	16.6	96.5	227.6	244.1
	Azteroid 3.3 FC + Mustang	6.3 fl oz + 4 fl oz	At Plant	In-Fur									
	UAN 28% WC-379	17 gal 1 qt	6 lf	Streamer									
4	UAN 28%	18 gal	9-May	PPI	250	8.0	$2,153	6815	27.1	16.6	96.3	236.7	250.7
	Azteroid 3.3 FC + Mustang	6.3 fl oz + 4 fl oz	At Plant	In-Fur									
	UAN 28% WC-814	17 gal 8 fl oz	6 lf	Streamer									
Average					255	7.8	$2,156	6828	26.7	16.9	96.4	231.3	250.0
LSD 5%					N.S.	N.S.	N.S.	N.S.	N.S.	N.S.	N.S.	N.S.	N.S.
CV%					4.5	6.2	8.5	8.5	6.3	4.4	0.5	8.4	6.9

***Vigor** 0 to 10 ratings, 10 is the best

Comments: This study was designed to test CHS products applied sidedress with 28% UAN to examine increases in in sugar and yield.

$/A: Payment calculated using early delivery adjustment where necessary, and the new quality payment minus fungicide and application cost.

Bold: Results are not statistically different from top-ranking treatment in each column.

Plant Health Trial

Gruehn - Pigeon, MI - 2024

Trial Quality: Good
Variety: BTS-1183
Planted: May 9
Harvested: September 30
Plots: 6 rows X 38 ft., 4 reps
Row Spacing: 22 in.

Soil Info: Sandy Loam
% OM: 2.5 **pH:** 7.5 **CEC:** 13
P: Very High **K:** Very High
Mn: High **B:** Medium
Added N: 36 lbs. 2X2 + 100 lbs. sidedress
Previous Crop: Corn

Rhizoc Level: Low
Cerc Control: Good
Problems: None
Seeding Rate: 4.1 in.
Rainfall: 12.34 in.
Beets/100 ft: 230

Application: JD 3520 tractor mounted plot sprayer, compressed air, 15.3 gpa - Foliar 7" band
Monosem 6-row Agronomy Planter, compressed air, 30 psi, 9 gpa - IF, 3.5' band

No.	Treatment	Rate/A	Applic Timing/ Date	Applic Method	RWST	Vigor* 0-10 27-Jun	Net $/A	RWSA	T/A	% SUC	% CJP	Beets/ 100 ft 2-Jul
23	**Lake Shore Ag**				**289**	**8.0**	**$1,594**	**7857**	**27.2**	**19.2**	**95.8**	**225**
	UAN 28% + 10-34-0 + Thio-Sul + Half Fulfill Half SyngerG	8 gal + 6 gal + 4 gal + 1 qt	At Plant	2X2								
	Azteroid FC 3.3 + Mustang Maxx + Starter Pre-Mix	6.3 fl oz + 4 fl oz + 56 oz	At Plant	In-Furr								
	UAN 28% + Half Fulfill Half SynerG	40 gal + 1 qt	11-Jun	Sidedress								
	SynerG + Moly + All-E-Viate	1 pt + 4 oz + 4 oz	6/3, 6/28, 7/29, 8/9, 8/23, 9/4	Broadcast								
	SynerG + Moly + Premium Boron	1 qt + 1 pt + 1 qt	15-Sep	Broadcast								
15	**Nachurs**				**288**	**8.0**	**$1,799**	**8333**	**29.0**	**19.0**	**96.0**	**227**
	UAN 28% + 10-34-0 + Thio-Sul	8 gal + 6 gal + 4 gal	At Plant	2X2								
	Azteroid FC 3.3 + Mustang Maxx	6.3 fl oz+ 4 fl oz	At Plant	In-Furr								
	Nachurs balance + Nachurs K-flex	1 gal + 2 qt	9-Aug	Broadcast								
22	**Lake Shore Ag**				**287**	**8.4**	**$1,674**	**8115**	**28.2**	**19.0**	**95.8**	**231**
	UAN 28% + 10-34-0 + Thio-Sul + Half Fulfill Half SyngerG	8 gal + 6 gal + 4 gal + 1 qt	At Plant	2X2								
	Azteroid FC 3.3 + Mustang Maxx + Starter Pre-Mix	6.3 fl oz + 4 fl oz + 56 oz	At Plant	In-Furr								
	Uan 28% + Half Fulfill Half SyngerG	40 gal + 1 qt	11-Jun	Sidedress								
	SynerG + Moly + All-E-Viate	1 pt + 4 oz + 4 oz	6/3, 6/28, 7/29	Broadcast								
	SynerG + Moly + Premium Boron	1 qt + 1 pt + 1 qt	4-Sep	Broadcast								

***Vigor 0 to 10 ratings, 10 is the best**

$/A: Payment calculated using early delivery adjustment where necessary, and the new quality payment minus fungicide and application cost.

Bold: Results are not statistically different from top-ranking treatment in each column.

No.	Treatment	Rate/A	Applic Timing/ Date	Applic Method	RWST	Vigor* 0-10 27-Jun	Net $/A	RWSA	T/A	% SUC	% CJP	Beets/ 100 ft 2-Jul
6	**Sure Crop**				**287**	**8.0**	**$1,884**	**8750**	**30.5**	**18.9**	**96.0**	**243**
	UAN 28% + 10-34-0 + Thio-Sul + Sure Crop Pop-up	8 gal + 6 gal + 4 gal + 3 gal	At Plant	2X2								
	Azteroid FC 3.3 + Mustang Maxx	6.3 fl oz + 4 fl oz	At Plant	In-Furr								
11	**Aqueus**				**287**	**8.1**	**$1,716**	**7997**	**28.0**	**18.8**	**96.5**	**240**
	UAN 28% + 10-34-0 + Thio-Sul	8 gal + 6 gal + 4 gal	At Plant	2X2								
	Azteroid FC 3.3 + Mustang Maxx + Growthful Soil	6.3 fl oz + 4 fl oz + 22 oz	At Plant	In-Furr								
	Growthful Foliar	12.8 fl oz	6/28, 7/29, 8/9	Broadcast								
	Growthful Foliar + Foliar K	12.8 fl oz + 1 gal	8/23, 9/4	Broadcast								
5	**Andersons**				**286**	**8.3**	$ 1,545	7221	25.2	**18.7**	**96.5**	**230**
	UAN 28% + 10-34-0 + Thio-Sul	8 gal + 6 gal + 4 gal	At Plant	2X2								
	Azteroid FC 3.3 + Mustang Maxx + Season Pass Diamond + Bio Pass	6.3 fl oz + 4 fl oz + 5 gal + 1 pt	At Plant	In-Furr								
	Korrect Plus	1 gal	8/9, 8/23	Broadcast								
9	**Aqueus**				**286**	7.5	**$1,631**	**7540**	26.3	**18.9**	**96.0**	**228**
	UAN 28% + 10-34-0 + Thio-Sul	8 gal + 6 gal + 4 gal	At Plant	2X2								
	Azteroid FC 3.3 + Mustang Maxx + Growthful Soil	6.3 fl oz + 4 fl oz + 22 oz	At Plant	In-Furr								
14	**Envita**				**286**	7.6	**$1,593**	**7522**	26.3	**18.7**	**96.6**	220
	10-34-0 + Thio-Sul	6 gal + 4 gal	At Plant	2X2								
	Azteroid FC 3.3 + Mustang Maxx + Envita	6.3 fl oz + 4 fl oz + .8 oz	At Plant	In-Furr								
	UAN 28% + Envita	40 gal + .8 oz	11-Jun	Sidedress								
16	**Nachurs**				**286**	**7.8**	$1,498	6986	24.4	**18.7**	**96.7**	**232**
	UAN 28% + 10-34-0 + Thio-Sul	8 gal + 6 gal + 4 gal	At Plant	2X2								
	Azteroid FC 3.3 + Mustang Maxx	6.3 fl oz + 4 fl oz	At Plant	In-Furr								
	Nachurs K-Fuel + Nachurs Moneyball	1 gal + 1.5 pt	29-Jul	Broadcast								
8	**Sure Crop**				**286**	**7.8**	$1,453	6825	23.8	**18.9**	**96.0**	**238**
	UAN 28% + 10-34-0 + Thio-Sul + Sure Crop Pop-up + Sure Crop 2X2 Additive	8 gal + 6 gal + 4 gal + 3 gal + .7 gal	At Plant	2X2								
	Azteroid FC 3.3 + Mustang Maxx	6.3 fl oz + 4 fl oz	At Plant	In-Furr								

***Vigor 0 to 10 ratings, 10 is the best**

$/A: Payment calculated using early delivery adjustment where necessary, and the new quality payment minus fungicide and application cost.

Bold: Results are not statistically different from top-ranking treatment in each column.

No.	Treatment	Rate/A	Applic Timing/ Date	Applic Method	RWST	Vigor* 0-10 27-Jun	Net $/A	RWSA	T/A	% SUC	% CJP	Beets/ 100 ft 2-Jul
17	**Nachurs**				**283**	**8.1**	**$1,646**	**7728**	**27.3**	**19.0**	95.4	**231**
	UAN 28% + 10-34-0 + Thio-Sul	8 gal + 6 gal + 4 gal	At Plant	2X2								
	Azteroid FC 3.3 + Mustang Maxx	6.3 fl oz + 4 fl oz	At Plant	In-Furr								
	Nachurs K-Fuel + Nachurs Moneyball	1 gal + 1.5 pt	29-Jul	Broadcast								
	Nachurs Balance + Nachurs K-Flex	1 gal + 2 qt	9-Aug	Broadcast								
13	**Envita**				**282**	**8.1**	$1,498	7140	25.1	**18.4**	**96.6**	223
	UAN 28% + 10-34-0 + Thio-Sul	4 gal + 6 gal + 4 ggal	At Plant	2X2								
	Azteroid FC 3.3 + Mustang Maxx + Envita	6.3 fl oz + 4 fl oz + .8 oz	At Plant	In-Furr								
	UAN 28% + Envita	40 gal + .8 oz	11-Jun	Broadcast								
7	**Sure Crop**				**280**	**7.8**	**$1,605**	**7513**	**26.6**	**18.7**	**95.7**	215
	UAN 28% + 10-34-0 + Thio-Sul + Sure Crop 2X2 Additive Mix	8 gal + 6 gal + 4 gal + .7 gal	At Plant	2X2								
	Azteroid FC 3.3 + Mustang Maxx	6.3 fl oz + 4 fl oz	At Plant	In-Furr								
2	**MTS**				**279**	**8.1**	$1,478	7225	25.8	**18.2**	**96.7**	**230**
	UAN 28% + 10-34-0 + Thio-Sul + Soil Carbon Mix	8 gal + 6 gal + 4 gal + 32 fl oz	At Plant	2X2								
	Azteroid FC 3.3 + Mustang Maxx	6.3 fl oz + 4 fl oz	At Plant	In-Furr								
	UAN 28% + Soil Carbon Mix	40 gal + 68.2 fl oz	11-Jun	Sidedress								
	LX7 Foliar Blend	1 pt	6/11, 6/28, 7/9, 7/17, 8/9, 8/23, 9/4	Broadcast								
12	**Envita**				**278**	**7.9**	**$1,602**	**7665**	**27.4**	**18.3**	**96.3**	**226**
	UAN 28% + 10-34-0 + Thio-Sul	8 gal + 6 gal + 4 gal	At Plant	2X2								
	Azteroid FC 3.3 + Mustang Maxx + Envita	6.3 fl oz + 4 fl oz + .8 oz	At Plant	In-Furr								
	UAN 28% + Envita	40 gal + .8 oz	11-Jun	Sidedress								
18	**Helena**				**277**	**8.0**	$1,554	**7466**	**26.8**	**18.1**	**96.8**	**235**
	UAN 28% + 10-34-0 + Thio-Sul + Receptor	8 gal + 6 gal + 4 gal + 1 pt	At Plant	2X2								
	Azteroid FC 3.3 + Mustang Maxx	6.3 fl oz + 4 fl oz	At Plant	In-Furr								
	UAN 28% + Hydra-Hume	32 gal + 1.6 ga	11-Jun	Sidedress								

***Vigor 0 to 10 ratings, 10 is the best**

$/A: Payment calculated using early delivery adjustment where necessary, and the new quality payment minus fungicide and application cost.

Bold: Results are not statistically different from top-ranking treatment in each column.

No.	Treatment	Rate/A	Applic Timing/ Date	Applic Method	RWST	Vigor* 0-10 27-Jun	Net $/A	RWSA	T/A	% SUC	% CJP	Beets/ 100 ft 2-Jul
3	**MTS**				**276**	**8.1**	$1,453	7170	26.0	**18.3**	**96.1**	**231**
	UAN 28% + 10-34-0 + Thio-Sul + Soil Carbon Mix	8 gal + 6 gal + 4 gal + 32 fl oz	At Plant	2X2								
	Azteroid FC 3.3 + Mustang Maxx	6.3 fl oz + 4 fl oz	At Plant	In-Furr								
	UAN 28% + Soil Carbon Mix	40 gal + 68.2 fl oz	11-Jun	Sidedress								
	LX7 Foliar Blend + Biostimulant	1 pt	6/11, 6/28, 7/9, 7/17, 8/9, 8/23, 9/4	Broadcast								
20	**Helena**				**272**	7.5	$1,297	6404	23.5	**17.8**	**96.6**	**237**
	UAN 28% + 10-34-0 + Thio-Sul + Receptor + Nucleua 0-0-21	8 gal + 6 gal + 3 gal + 1 pt + 1 gal	At Plant	2X2								
	Azteroid FC 3.3 + Mustang Maxx	6.3 fl oz + 4 fl oz	At Plant	In-Furr								
	UAN 28% + Nucleus 0-0-21 + Hydrahume	27 gal + 2 gal + 1.4 gal	11-Jun	Sidedress								
	CoRoN Metra	2 gal	28-Jun	Banded								
4	**Andersons**				**271**	7.6	$1,453	6899	25.3	**17.7**	**96.9**	**237**
	UAN 28% + 10-34-0 + Thio-Sul	8 gal + 6 gal + 4 gal	At Plant	2X2								
	Azteroid FC 3.3 + Mustang Maxx + Sesson Pass Diamond + Bio Pass	6.3 fl oz + 4 fl oz + 5 gal + 1 pt	At Plant	In-Furr								
19	**Helena**				**271**	**8.5**	$1,429	7027	25.9	**17.7**	**96.9**	223
	UAN 28% + 10-34-0 + Thio-Sul + Receptor + Nucleus 0-0-21	8 gal + 6 gal + 3 gal + 1 pt + 1 gal	At Plant	2X2								
	Azteroid FC 3.3 + Mustang Maxx	6.3 fl oz + 4 fl oz	At Plant	In-Furr								
	UAN 28% + Nucleus 0-0-21 + Hydrahume	32 gal + 2 gal + 1.6 gal	11-Jun	Sidedress								
1	UAN 28% + 10-34-0 + Thio-Sul	8 gal + 6 gal + 4 gal	At Plant	2X2	**270**	**7.9**	$1,417	6687	24.5	**17.8**	**96.5**	215
	Azteroid FC 3.3 + Mustang Maxx	6.3 fl oz + 4 fl oz	At Plant	In-Furr								

***Vigor 0 to 10 ratings, 10 is the best**

$/A: Payment calculated using early delivery adjustment where necessary, and the new quality payment minus fungicide and application cost.

Bold: Results are not statistically different from top-ranking treatment in each column.

No.	Treatment	Rate/A	Applic Timing/ Date	Applic Method	RWST	Vigor* 0-10 27-Jun	Net $/A	RWSA	T/A	% SUC	% CJP	Beets/ 100 ft 2-Jul
10	**Aqueus**				**268**	**7.8**	**$1,589**	**7571**	**28.2**	**18.3**	95.0	**237**
	UAN 28% + 10-34-0 + Thio-Sul	8 gal + 6 gal + 4 gal	At Plant	2X2								
	Azteroid FC 3.3 + Mustang Maxx + Growthful Soil	6.3 fl oz + 4 fl oz + 22 oz	At Plant	In-Furr								
	Growthful Foliar	12.8 fl oz	8/1, 9/1	Broadcast								
21	**Helena**				266	**8.1**	$1,489	**7436**	**27.9**	17.2	**97.3**	**234**
	UAN 28% + 10-34-0 + Thio-Sul + Receptor + Nucleus 0-0-21	8 gal + 6 gal + 3 gal + 1 pt + 1 gal	At Plant	2X2								
	Azteroid FC 3.3 + Mustang Maxx	6.3 fl oz + 4 fl oz	At Plant	In-Furr								
	UAN 28% + Nucleus 0-0-21 + Hydrahume + Boron 10%	27 gal + 2 gal + 1.4 gal + 2 qt	11-Jun	Sidedress								
	CoRoN Metra + Axilo BMZ + K-Leaf Versa 0-0-29	2 gal + 1 lb + 2 qt	23-Aug	Broadcast								
Average					280	8.0	$1,561	7438	26.5	18.5	96.3	230
LSD 5%					21.7	0.7	324.8	1360.7	4.0	1.5	1.6	19.4
CV%					5.5	6.4	14.7	13.0	10.7	5.8	1.2	6.0

***Vigor 0 to 10 ratings, 10 is the best**

Comments: Study was designed to test products for sugar and yield improvements.

$/A: Payment calculated using early delivery adjustment where necessary, and the new quality payment minus fungicide and application cost.

Bold: Results are not statistically different from top-ranking treatment in each column.

Stoller Early Harvest

Blumfield East - Richville, MI - 2024

Trial Quality: Good
Variety: C-G233
Planted: May 6
Harvested: September 12
Plots: 6 rows X 38 ft., 4 reps
Row Spacing: 22 in.

Soil Info: Clay Loam
% OM: 3 **pH:** 8 **CEC:** 17.3
P: Very High **K:** Very High
Mn: High **B:** High
Added N: 36 lbs. 2X2 + 100 lbs. sidedress
Previous Crop: Wheat/Clover

Rhizoc Level: Low
Cerc Control: Good
Problems: None
Seeding Rate: 4.1 in.
Rainfall: 14.34 in.
Beets/100 ft: 257

Application: JD 3520 tractor mounted plot sprayer, compressed air, 15.3 gpa
Monosem 6-row Agronomy Planter, compressed air, 30 psi, 9 gpa - IF, 3.5" band

No.	Treatment	Rate/A	Applic Timing*	RWST	Net $/A	RWSA	T/A	% SUC	% CJP
3	UAN 28% + 10-34-0 + Thio-Sul	8 gal + 6 gal + 4 gal	2X2	264	$1,439	6031	22.9	17.6	95.9
	Azteroid 3.3 FC + Mustang Maxx + Energy Power + Fortified Stimulate Yield Enhance	6.3 fl oz + 4 oz + 8 oz + 4 oz	In-Furr						
	Energy Power + Keylate CoMo Classic	8 oz + 4 oz	2nd Herbicide						
	Energy Power + Keylate CoMo Classic	8 oz + 4 oz	3rd Herbicide						
	Sugar Mover Premier	32 oz	1st Fungicide						
	Sugar Mover Premier	32 oz	30 days before topping						
	Sugar Power	128 oz	12 days before topping						
2	UAN 28% + 10-34-0 + Thio-Sul	8 gal + 6 gal + 4 gal	2X2	264	$1,432	5968	22.4	17.5	96.3
	Azteroid 3.3 FC + Mustang Maxx	6.3 fl oz + 4 fl oz	In-Furr						
	Sugar Mover Premier	32 oz	30 days before topping						
	Sugar Power	128 oz	12 days before topping						
1	UAN 28% + 10-34-0 + Thio-Sul	8 gal + 6 gal + 4 gal	2X2	256	$1,393	5880	22.9	17.3	95.2
	Azteroid 3.3 FC + Mustang Maxx	6.3 fl oz + 4 fl oz	In-Furr						
Average				261	$1,421	5959	22.7	17.4	95.8
LSD 5%				N.S.	N.S.	N.S.	N.S.	N.S.	N.S.
CV%				4.9	18.3	16.2	11.2	5.8	1.6

***Application: 2nd Herbicide - 6/13, 3rd Herbicide - 7/2, 1st Fungicide - 7/15, 30 days before topping - 8/13, 12 days before topping - 8/30**

Comments: Study was designed to test Stoller products for yield and sugar enhancement. Trial was harvested early.

$/A: Payment calculated using early delivery adjustment where necessary, and the new quality payment minus fungicide and application cost.
Bold: Results are not statistically different from top-ranking treatment in each column.

Stoller Regular Harvest

Blumfield East - Richville, MI - 2024

Trial Quality: Good
Variety: C-G233
Planted: May 6
Harvested: October 8
Plots: 6 rows X 38 ft., 4 reps
Row Spacing: 22 in.

Soil Info: Clay Loam
% OM: 3 **pH:** 8 **CEC:** 17.3
P: Very High **K:** Very High
Mn: High **B:** High
Added N: 36 lbs. 2X2 + 100 lbs. sidedress
Previous Crop: Wheat/Clover

Rhizoc Level: Low
Cerc Control: Good
Problems: None
Seeding Rate: 4.1 in.
Rainfall: 14.34 in.
Beets/100 ft: 243

Application: JD 3520 tractor mounted plot sprayer, compressed air, 15.3 gpa
Monosem 6-row Agronomy Planter, compressed air, 30 psi, 9 gpa - IF, 3.5" band

No.	Treatment	Rate/A	Applic Timing*	RWST	Net $/A	RWSA	T/A	% SUC	% CJP
3	UAN 28% + 10-34-0 + Thio Sul	8 gal + 6 gal + 4 gal	2X2	284	$1,636	7862	27.7	18.8	**96.0**
	Azteroid 3.3 FC + Mustang Maxx 6 Energy Power + Fortified Stimulate Yield Enhance	6.3 fl oz + 4 fl oz + 8 oz + 4 oz	In-Furr						
	Energy Power + Keylate CoMo Premier	8 oz + 4 oz	3rd Herbicide						
	Sugar Mover Premier	32 oz	2nd Fungicide						
	Sugar Mover Premier	32 oz	3rd Fungicide						
4	UAN 28% - 10-34-0 + Thio-Sul	8 gal + 6 gal + 4 gal	2X2	284	$1,636	7886	27.8	18.8	**95.9**
	Azteroid 3.3 FC + Mustang Maxx 6 Energy Power + Fortified Stimulate Yield Enhance	6.3 fl oz + 4 fl oz + 8 oz + 4 oz	In-Furr						
	Energy Power + Keylate CoMo Premier	8 oz + 4 oz	3rd Herbicide						
	Sugar Mover Premier	32 oz	2nd Fungicide						
	Sugar Mover Premier	32 oz	3rd Fungicide						
	Sugar Mover Premier	32 oz	30 days before topping						
	Sugar Power	128 oz	12 days before topping						
1	UAN 28% + 10-34-0 + Thio-Sul	8 gal + 6 gal + 4 gal	2X2	280	$1,562	7522	26.8	18.7	95.5
	Azteroid 3.3 FC + Mustang Maxx	6.3 fl oz + 4 fl oz	In-Furr						
2	UAN 28% + 10-34-0 + Thio-Sul	8 gal + 6 gal + 4 gal	2X2	278	$1,514	7339	26.4	18.5	**95.7**
	Azteroid 3.3 FC + Mustang Maxx	6.3 fl oz + 4 fl oz	In-Furr						
	Sugar Mover Premier	32 oz	30 days before topping						
	Sugar Power	128 oz	12 days before topping						
Average				282	$1,587	7652	27.2	18.7	95.8
LSD 5%				N.S.	N.S.	N.S.	N.S.	N.S.	0.4
CV%				1.9	7.0	6.6	5.9	1.6	0.3

***Application: 3rd Herbicide - 7/1, 2nd Fungicide - 7/24, 3rd Fungicide - 8/9, 30 days before topping - 9/4, 12 days before topping - 9/23**

Comments: Study was designed to test Stoller products for yield and sugar enhancement. Trial was harvested later in the season

$/A: Payment calculated using early delivery adjustment where necessary, and the new quality payment minus fungicide and application cost.

Bold: Results are not statistically different from top-ranking treatment in each column.

Herbicide Trial

Sylvester - Akron, MI - 2024

Trial Quality: Good
Variety: C-G214NT
Planted: April 16
Harvested: October 3
Plots: 6 rows X 38 ft, 4 reps
Row Spacing: 22 in.

Soil Info: Clay Loam
% OM: 3.4 **pH:** 7.8 **CEC:** 17.5
P: Very High **K:** Very High
Mn: High **B:** High
Added N: 36 lbs. 2X2 + 100 lbs. sidedress
Previous Crop: Wheat /Raddish/Rye

Rhizoc Level: Low
Cerc Control: Good
Problems: None
Seeding Rate: 4.1 in.
Rainfall: 10.98 in.
Beets/100 ft: 116

Application: JD 3520 tractor mounted plot sprayer, compressed air, 30 psi, 15.3 gpa
Monosem 6-row Agronomy Planter, compressed air, 30 psi, 9 gpa - IF, 3.5" band

No.	Treatment	Rate/A	Applic Timing	% Spray Damage * 0-100	RWST	Net $/A	RWSA	T/A	% SUC	% CJP	B/100	Dead B/100
				31-May							30-Apr	2-Aug
1	Dual Magnum	8 fl oz	Pre	**0.0**	297	**$2,036**	9424	**31.8**	19.6	95.8	**122.6**	1.3
	Roundup Powermax + Ammonium Sulfate + Stinger + Mustang Maxx + Excalia	24 fl oz + 17 lb + 2 fl oz + 4 fl oz + 2 fl oz	2 lf									
3	Ethotron	3 pt	Pre	**3.8**	**310**	**$2,122**	9686	31.2	**20.4**	**96.1**	111.0	0.2
	Roundup Powermax + Ammonium Sulfate + Stinger + Mustang Maxx + Excalia	24 fl oz + 17 lb + 2 fl oz + 4 fl oz + 2 fl oz	2 lf									
7	Ethotron	3 pt	Pre	**5.0**	303	**$2,061**	9506	31.4	19.7	**96.6**	**117.9**	1.1
	Outlook + Roundup Powermax + Ammonium Sulfate + Stinger + Mustang Maxx + Excalia	1 pt + 24 fl oz + 17 lb + 2 fl oz + 4 fl oz + 2 fl oz	2 lf									
2	Dual Magnum + Ethotron	8 fl oz + 16 fl oz	Pre	**5.0**	300	**$2,122**	9781	**32.6**	**19.8**	**96.0**	107.3	0.4
	Roundup Powermax + Ammonium Sulfate + Stinger + Mustang Maxx + Excalia	24 fl oz + 17 lb + 2 fl oz + 4 fl oz + 2 fl oz	2 lf									
5	Dual Magnum	8 fl oz	Pre	**6.3**	291	**$2,090**	9752	**33.5**	19.0	**96.4**	108.6	0.6
	Outlook + Roundup Powermax + Ammonium Sulfate + Stinger + Mustang Maxx + Excalia	1 pt + 24 fl oz + 17 lb + 2 fl oz + 4 fl oz + 2 fl oz	2 lf									
8	Ethotron	2 pt	Pre	**8.8**	304	**$2,164**	9968	**32.9**	**20.0**	**95.9**	111.9	0.6
	Outlook + Roundup Powermax + Ammonium Sulfate + Stinger + Mustang Maxx + Excalia	1 pt + 24 fl oz + 17 lb + 2 fl oz + 4 fl oz + 2 fl oz	2 lf									
4	Ethotron	2 pt	Pre	**8.8**	**308**	**$2,171**	9922	**32.2**	**20.2**	**96.2**	**141.2**	1.5
	Roundup Powermax + Ammonium Sulfate + Stinger + Mustang Maxx + Excalia	24 fl oz + 17 lb + 2 fl oz + 4 fl oz + 2 fl oz	2 lf									
10	Dual Magnum + Ethotron	8 fl oz + 16 fl oz	Pre	**10.0**	301	**$2,125**	9808	**32.6**	19.7	**96.2**	114.2	0.0
	Warrant + Roundup Powermax + Ammonium Sulfate + Stinger + Mustang Maxx + Excalia	3 pt + 24 fl oz + 17 lb + 2 fl oz + 4 fl oz + 2 fl oz	2 lf									
6	Dual Magnum + Ethotron	8 fl oz + 16 fl oz	Pre	**11.3**	**323**	**$2,235**	10059	31.1	**21.0**	**96.6**	105.8	0.0
	Outlook + Roundup Powermax + Ammonium Sulfate + Stinger + Mustang Maxx + Excalia	1 pt + 24 fl oz + 17 lb + 2 fl oz + 4 fl oz + 2 fl oz	2 lf									

Spray Damage* Ratings are on a scale of 0-100, 0 = no spray damage and 100 = total spray damage

$/A: Payment calculated using early delivery adjustment where necessary, and the new quality payment minus fungicide and application cost.

Bold: Results are not statistically different from top-ranking treatment in each column.

Herbicide Trial

Sylvester - Akron, MI - 2024

No.	Treatment	Rate/A	Applic Timing	% Spray Damage * 0-100 31-May	RWST	Net $/A	RWSA	T/A	% SUC	% CJP	B/100 30-Apr	Dead B/100 2-Aug
12	Ethotron	2 pt	Pre	17.5	300	**$2,073**	9586	**31.9**	19.7	**96.3**	**124.1**	0.2
	Warrant + Roundup Powermax + Ammonium Sulfate + Stinger + Mustang Maxx + Excalia	3 pt + 24 fl oz + 17 lb + 2 fl oz + 4 fl oz + 2 fl oz	2 lf									
9	Dual Magnum	8 fl oz	Pre	17.5	298	$2,011	9312	31.3	19.7	**95.9**	114.2	0.4
	Warrant + Roundup Powermax + Ammonium Sulfate + Stinger + Mustang Maxx + Excalia	3 pt + 24 fl oz + 17 lb + 2 fl oz + 4 fl oz + 2 fl oz	2 lf									
11	Ethotron	3 pt	Pre	18.8	**305**	**$2,126**	9766	**31.9**	**19.9**	**96.5**	**124.1**	0.6
	Warrant + Roundup Powermax + Ammonium Sulfate + Stinger + Mustang Maxx + Excalia	3 pt + 24 fl oz + 17 lb + 2 fl oz + 4 fl oz + 2 fl oz	2 lf									
Average				9.4	303.4	$2,111	9714	32.0	19.9	96.2	116.9	0.6
LSD 5%				11.8	18.2	213.2	N.S.	2.0	1.2	0.7	24.3	N.S.
CV%				87.6	4.2	7.0	5.9	4.3	4.2	0.5	14.4	209.6

Spray Damage* Ratings are on a scale of 0-100, 0 = no spray damage and 100 = total spray damage

Comments: Study was designed to study the safety of Pre and Post herbicides on sugarbeets.

$/A: Payment calculated using early delivery adjustment where necessary, and the new quality payment minus fungicide and application cost.

Bold: Results are not statistically different from top-ranking treatment in each column.

Pre-Emerge Trial

Sylvester - Akron, MI - 2024

Trial Quality: Fair
Variety: C-G214NT
Planted: April 16
Harvested: October 3
Plots: 6 rows X 38 ft., 4 reps
Row Spacing: 22 in.

Soil Info: Clay Loam
% OM: 3.4 **pH:** 7.8 **CEC:** 17.5
P: Very High **K:** Very High
Mn: High **B:** High
Added N: 36 lbs. 2X2 + 100 lbs. sidedress
Previous Crop: Wheat/Raddish/Rye

Rhizoc Level: Low
Cerc Control: Good
Problems: None
Seeding Rate: 4.1 in.
Rainfall: 10.98 in.
Beets/100 ft: 108

Application: JD 3520 tractor mounted plot sprayer, compressed air, 15.3 gpa
Monosem 6-row Agronomy Planter, compressed air, 30 psi, 9 gpa - IF, 3.5" band

No.	Treatment	Rate/A	Applic Timing	RWST	% Injury 0-100	Net $/A	RWSA	T/A	% SUC	% CJP
					31-May					
4	Dual II Magnum Ethotron	8 oz 16 oz	Pre-Emerge	309	**10**	$1,950	8871	28.7	19.9	**97.2**
2	Dual II Magnum Ethotron	8 oz 8 oz	Pre-Emerge	308	**5**	**$2,191**	**9954**	**32.2**	20.0	**96.7**
6	Dual II Magnum Ethotron	8 oz 24 oz	Pre-Emerge	307	**5**	**$2,048**	**9338**	**30.4**	20.0	**96.7**
3	Ethotron	8 oz	Pre-Emerge	304	**5**	$1,930	8816	29.0	19.8	96.4
5	Ethotron	16 oz	Pre-Emerge	302	**10**	$1,929	8840	29.3	19.5	**96.9**
7	Ethotron	24 oz	Pre-Emerge	301	**10**	$1,890	8672	28.8	19.6	96.6
8	Dual II Magnum Ethotron	8 oz 32 oz	Pre-Emerge	301	**10**	$1,958	9002	**30.0**	19.7	96.3
1	Dual II Magnum	8 oz	Pre-Emerge	298	**0**	**$2,068**	**9512**	**31.9**	19.5	96.4
9	Ethotron	32 oz	Pre-Emerge	294	**0**	$1,795	8300	28.1	19.1	**96.7**
Average				303		$1,973	9034	29.8	19.7	96.6
LSD 5%				N.S.		215.0	867.1	2.3	N.S.	0.5
CV%				3.8		7.5	6.6	5.2	3.8	0.3

% Injury 0-100%, 0 is no injury.

Comments: Study was designed to test injury from pre-emergence herbicides. No stand loss was observed from the treatments.

$/A: Payment calculated using early delivery adjustment where necessary, and the new quality payment minus fungicide and application cost.

Bold: Results are not statistically different from top-ranking treatment in each column.

MICHIGAN STATE UNIVERSITY EXTENSION

Michigan State University AgBioResearch

Sugarbeet tolerance to Ultra Blazer alone and tank-mixed with Warrant

Christy Sprague and Brian Stiles II, Michigan State University

Location: Richville (SVREC)	**Application timings**: PRE (April 22), 2 lf beets (May 16), 6 lf beets (May 30), 12 lf beets (June 12)
Planting Date: April 16, 2024	**Herbicides:** see treatments
Soil Type: Clay loam	**O.M.:** 2.3 **pH:** 7.5
Replicated: 4 times	**Variety:** Crystal G049RR

Table 1. Sugarbeet tolerance to POST applications of Ultra Blazer (acifluorfen) applied at various sugarbeet stages and with various mixtures, 14 d after the 6-lf, 7, 21, and 35 d after the 12-lf application.

Herbicide treatments[a]	Timing	Injury (June 13)	Injury (June 20)	Injury (July 3)	Injury (July 17)	Yield	RWSA
		— % —	— % —	— % —	— % —	– ton/A –	– lb/A –
Roundup PowerMax 3 (30/20/20 fl oz)	2-, 6-, 12 lf	2	0	0	0	31.9	7796
Ultra Blazer (12/12 fl oz)	6-, 12 lf	22*[b]	11*	9*	0	28.8	7504
Ultra Blazer (16 fl oz)	6 lf	25*	5*	3	0	29.9	6763
Ultra Blazer (16 fl oz) + Warrant (3 pt)	6 lf	24*	8*	2	0	28.6	6768
Ultra Blazer (16/16 fl oz)	6-, 12 lf	25*	18*	11*	0	28.0	7217
Ultra Blazer (16 fl oz) + Warrant (3 pt)	6-, 12 lf	24*	16*	13*	0	26.0	6550
Ultra Blazer (16 fl oz) + NIS (0.25%)	6 lf	25*	6*	4	0	28.4	6849
Ultra Blazer (16 fl oz) + Warrant (3 pt) + NIS (0.25%)	6 lf	25*	6*	3	0	30.3	7474
Ultra Blazer (16 fl oz)	12 lf	2	9*	7*	0	28.5	7213
Ultra Blazer (16 fl oz) + Warrant (3 pt)	12 lf	2	4	4	0	28.4	7044
$LSD_{0.05}$[c]		*2.2*	*4.1*	*4.1*	*N.S.*	*N.S.*	*N.S.*

[a] Roundup PowerMax 3 was included in all postemergence treatments at the rates listed in the first treatment. These treatments also included AMS at 17 lb/100 gal.

[b] Injury, yield and recoverable white sugar per acre (RWSA) data with asterisks (*) are significantly different than the Roundup PowerMax 3 alone control.

[c] Means within a column greater than least significant difference (LSD) value are different from each other.

Summary: Currently, options are extremely limited for POST control of glyphosate-resistant waterhemp in sugarbeet. Ultra Blazer (acifluorfen) is a Group 14 herbicide that has activity on pigweed species, unless they are resistant to the Group 14 herbicides. Over the past several years we have conducted research evaluating sugarbeet safety to POST applications of Ultra Blazer. Ultra Blazer injury to sugarbeet consists of leaf speckling/bronzing. From our past trials it appeared tank-mixing Warrant with Ultra Blazer may reduce sugarbeet injury compared with Ultra Blazer alone. This year tank-mixing Warrant with Ultra Blazer did not reduce sugarbeet injury as it had in the past. However, it also did not increase injury. Applying Ultra Blazer or Ultra Blazer + Warrant when sugarbeet was at the 6 or 12-leaf stage did not affect sugarbeet yield or RWSA this year compared with Roundup PowerMax 3 applied alone. This research helps support Michigan's Section 18 registration for Ultra Blazer applications on sugarbeets at the 6-leaf stage or larger at a 16 fl oz/A rate and may provide evidence to allow for the inclusion Warrant to Ultra Blazer applications in the future.

MICHIGAN STATE UNIVERSITY EXTENSION

Michigan State University AgBioResearch

Sugarbeet tolerance to residual herbicide strategies in sugarbeet

Christy Sprague and Brian Stiles II, Michigan State University

Location: Richville (SVREC)	**Application timings**: PRE (April 22), 2 lf beets (May 16), 6-8 lf beets (May 30),
Planting Date: April 16, 2024	**Herbicides:** see treatments
Soil Type: Clay loam	**O.M.:** 2.3 **pH:** 7.5
Replicated: 4 times	**Variety:** Crystal G049RR

Table 1. Sugarbeet tolerance of overlapping residual herbicide strategies at 7, 21, and 56 d after the 6-8 lf herbicide application.

Herbicide treatments[a]		Injury (June 6)	Injury (June 20)	Injury (July 25)	Yield	RWSA
PREs	***POST at 2- and 6-lf beets***	— % —	— % —	— % —	– ton/A –	– lb/A –
None	PowerMax 3 (30/20 fl oz)	0	2	0	29.5	7018
Dual Mag.[b] (0.5 pt)	Dual Mag. (1.3 pt) - 2 lf only	0	1	0	33.0	8331
Dual Mag. (0.5 pt)	Warrant (3 pt) - 2 lf only	0	0	0	32.9	8556
Dual Mag. (0.5 pt)	Outlook (16 fl oz) - 2 lf only	0	0	0	27.2	6841
Dual Mag. (0.5 pt)	Dual Magnum (1.3/1.3 pt)	0	0	0	28.9	6999
Ethofumesate (3 pt)	Dual Magnum (1.3/1.3 pt)	0	3	0	25.7	6183
Dual Mag. (0.5 pt)	Warrant (3/3 pt)	0	3	0	30.4	7691
Dual Mag. (0.5 pt)	Outlook (12/12 fl oz)	0	0	0	31.0	7851
Dual Mag. (0.5 pt)	Etho (6 fl oz) + Dual Mag. (1 pt)	0	0	0	27.0	6943
None	Etho (6 fl oz) + Dual Mag. (1 pt)	0	2	0	30.0	7620
None	Ultra Blazer (16 fl oz) - 6 lf only	24*[c]	10*	0	27.2	7111
None	Blazer + Warrant (3 pt) - 6 lf only	18*	10*	0	31.2	7933
Dual Mag. (0.5 pt)	Ultra Blazer (16 fl oz) - 6 lf only	24*	13*	0	31.0	7877
Dual Mag. (0.5 pt)	Blazer + Warrant (3 pt) - 6 lf only	18*	8*	0	29.4	7474
$LSD_{0.05}$[d]		*1.5*	*3.5*	*N.S.*	*N.S.*	*N.S.*

[a] Roundup PowerMax 3 was included in all POST treatments at the rates listed in the first treatment. These treatments also included AMS at 17 lb/100 gal. All POST applications of ethofumesate (Etho) were applied with 1.5 pt/A of Destiny HC.
[b] Abbreviations: Dual Mag. = Dual Magnum; PowerMax = Roundup PowerMax; Blazer = Ultra Blazer; N.S.= not significant.
[c] Injury, yield and recoverable white sugar per acre (RWSA) data with asterisks (*) are significantly different than the Roundup PowerMax 3 alone control.
[d] Means within a column greater than least significant difference (LSD) value are different from each other.

Summary: Residual herbicide programs are currently the only way to effectively control glyphosate-resistant (GR) waterhemp in sugarbeet. A field trial was conducted examining the crop safety of several herbicide programs containing Group 15 herbicides (Dual Magnum, Outlook, and Warrant) and ethofumesate that could be used for GR waterhemp control. Additionally, Ultra Blazer applications POST was examined for crop safety once sugarbeet was at the 6-leaf stage. Sugarbeet injury was low (<3%) with overlapping residual herbicides. However, applying Ultra Blazer alone or with Warrant resulted in significant sugarbeet injury (18-25%), 7 d after application. The addition of Warrant to Ultra Blazer in this trial had slightly lower injury than Ultra Blazer applied alone at this time. However, regardless of sugarbeet injury level there was no difference in sugarbeet yield or recoverable white sugar per acre when compared with the standard treatment of Roundup PowerMax 3 applied alone. The information from this trial indicates that several of the treatments that we are recommending for glyphosate-resistant waterhemp control will not negatively affect sugarbeet yield. We will continue to develop, examine, and refine strategies to manage waterhemp and other glyphosate-resistant weeds in sugarbeet.

MICHIGAN STATE UNIVERSITY EXTENSION

Michigan State University AgBioResearch

Waterhemp control with strategies using residual herbicides in sugarbeet

Christy Sprague and Brian Stiles II, Michigan State University

Location: Shiawassee County	**Application timings**: PRE (May 21), 2-lf beets (June 13), 6-8 lf beets (June 27)
Planting Date: May 21, 2024	**Herbicides:** see treatments
Soil Type: Clay loam	**O.M.:** 2.3 **pH:** 7.5
Replicated: 3 times	**Variety:** Crystal G049RR

Table 1. Waterhemp control 11 d after the 2-leaf herbicide application, and 6 and 44 days after the last application (6-8 leaf beets).

Herbicide treatments[a]		Waterhemp control[b]		
		June 24 (11 DA-2-lf)	July 3 (6 DA-6-lf)	Aug. 10 (44 DA-6-lf)
PREs	***POST apps. at 2- and 6-lf beets***	—%—	—%—	—%—
None	Roundup PowerMax 3 (30/20 fl oz)	3	0	0
Dual Magnum (0.5 pt)	Dual Magnum (1.3 pt) – 2 lf only	91*	95*	75
Dual Magnum (0.5 pt)	Warrant (3 pt) – 2 lf only	96*	96*	88*
Dual Magnum (0.5 pt)	Outlook (16 fl oz) – 2 lf only	95*	98*	85
Dual Magnum (0.5 pt)	Dual Magnum (1.3/1.3 pt)	91*	92*	87*
Dual Magnum (0.5 pt)	Warrant (3/3 pt)	88*	90	85
Dual Magnum (0.5 pt)	Outlook (12/12 fl oz)	92*	95*	86
Dual Magnum (0.5 pt)	Etho (6 fl oz) + Dual Magnum (1pt)	97*	99*	91*
None	Etho (6 fl oz) + Dual Magnum (1pt)	30	65	47
None	Ultra Blazer (16 fl oz) – 6 lf only	10	83	68
None	U. Blazer + Warrant (3 pt) – 6 lf only	0	78	63
Dual Magnum (0.5 pt)	Ultra Blazer (16 fl oz) – 6 lf only	88*	98*	86
Dual Magnum (0.5 pt)	U. Blazer + Warrant (3 pt) – 6 lf only	87*	94*	90*
Ethofumesate (3 pt)	Dual Magnum (1.3/1.3 pt)	99*	100*	97*
Ethofumesate (3 pt)	Etho (6 fl oz) + Dual Magnum (1pt)	93*	96*	95*
$LSD_{0.05}$[c]		*11*	*9*	*10*

[a] Roundup PowerMax 3 was included in all POST treatments at the rates listed in the first treatment. These treatments also included AMS at 17 lb/100 gal. All POST applications of ethofumesate (Etho) were applied with 1.5 pt/A of Destiny HC.
[b] Waterhemp control evaluations with asterisks (*) are similar to the best waterhemp control treatment.
[c] Means within a column greater than least significant difference (LSD) value are different from each other.

Summary: Currently, residual herbicide programs may be the only way to effectively control glyphosate-resistant (GR) waterhemp in sugarbeet. A field trial was conducted evaluating several Group 15 herbicides (Dual Magnum, Outlook, and Warrant) and ethofumesate. Additionally, Ultra Blazer POST was examined for waterhemp control once sugarbeet was at the 6-leaf stage. A PRE herbicide of Dual Magnum (0.5 pt) or Ethofumesate (3 pt) followed by overlapping Group 15 herbicides were important for GR waterhemp control. In fact, end of season waterhemp control was greatest (97%) when Ethofumesate (3 pt) was applied PRE followed by Dual Magnum (1.3/1.3 pt) applications at the 2 and 6-leaf sugarbeet stages. There were several herbicide programs that provided similar control (87-97%) and each of these programs had a PRE herbicide application. Applications of Ultra Blazer at the 6-8 lf stage also helped with control as long as a PRE herbicide was applied. One important take away from this trial is that the use of a PRE herbicide application of Dual Magnum (0.5 pt) using the 24C label or Ethofumesate (3 pt) were important for initial waterhemp control followed by an overlapping Group 15 herbicide. However, it is important to make sure the overlapping residuals are applied prior to any waterhemp emergence. We will continue to develop, examine, and refine waterhemp control strategies in sugarbeet.

Cercospora leaf spot, damage, and variety impacts on postharvest storage rots in sugarbeet, 2023-24

Carly Hendershot[1], Chris Bloomingdale[1], Holly Corder[1], Tom Goodwill[2], Sarah Ruth[1], Linda E. Hanson[1,2], and Jaime F. Willbur[1]; [1]Michigan State University; [2]USDA-ARS

Objective 1: Evaluate the impact of Cercospora leaf spot (CLS) field infection on storage rot symptom development on bruised beets. Previous results show that CLS levels in the field do not affect rot development in storage for the pathogens and varieties tested when beets are hand harvested (REACh 2021, 2022). Feedback from the industry indicated CLS may impact storability following commercial harvest.

Methods: CLS was rated on the KWS scale of 0 (disease-free) to 10 (>50% necrotic). Healthy-appearing beets were harvested by hand, washed with water, and bruised on one side using a 1.5-kg weight dropped from a 1-meter height. Beets were stored at 7 °C in plastic bags with wood shavings to reduce free moisture. At each timepoint, beets were removed from storage and inoculated with a known storage rot pathogen or with a sterile clarified V8 (CV8) plug as a control. Based on common pathogens from 2019-22 MSC pile samples, *Penicillium vulpinum, Botrytis cinerea*, and *Fusarium graminearum* were chosen for storage trials. Inoculated beets were incubated with the agar plug at ambient temperature for 7 days before the plug was removed. Rot length, width, and depth were measured, and overall rot volume was calculated using those values.

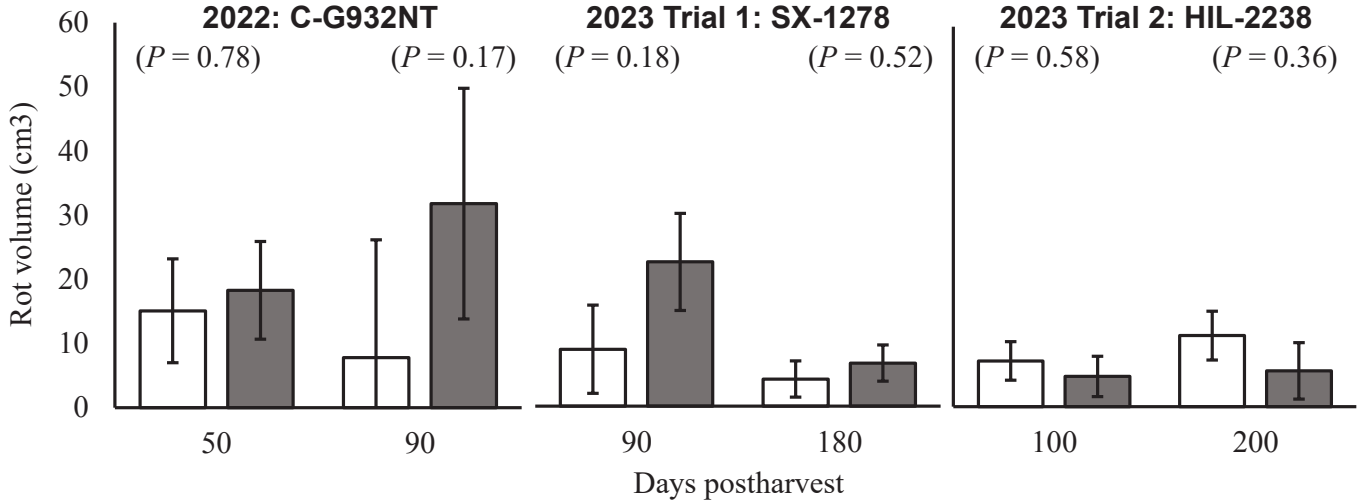

Figure 1. Volume of rotted tissue at mid-beet bruise point in beets with high or low in-season CLS levels inoculated with storage pathogens after 4- (2022) or 8- (2023) week incubation. Beets inoculated with *Fusarium graminearum, Botrytis cinerea,* or *Penicillium vulpinum*. CLS did not have a significant impact on rate of rot development in 2022 or in 2023 trial 1 or trial 2 ($P > 0.05$, n=12 beets per treatment). All values were corrected for control before statistical analysis. Analyses were conducted within each timepoint and year. Beet roots were harvested from a randomized complete block trial grown in Frankenmuth, Michigan in the growing seasons 2022 and 2023.

Summary: There was no significant difference in rate of rot development between CLS levels across all three pathogens during any timepoint in either year ($P > 0.05$) (Figure 1). Correlation analyses within symptomatic bruised tissues indicated area under the disease progress curve (AUDPC) calculated from in-season CLS severities was significantly associated with volume of storage rot symptoms ($r = 0.26$, $P < 0.05$). Despite numerically elevated values, CLS level also did not significantly impact relative electrolyte leakage in the two years and four timepoints measured ($P > 0.05$, data not shown). Overall, these results indicate CLS may predispose beets to harvest damage and subsequently increase storage rot susceptibility. Bruise significantly increased rot development at 4 of the 6 tested timepoints ($P < 0.01$). At 200-days postharvest, there was a significant interaction between CLS and bruise ($P < 0.05$), which is approaching the maximum time in storage.

Objective 2: Determine susceptibility of varieties to post-harvest rot pathogens. Twelve varieties were tested for storage rot susceptibility.

Methods: Beets were harvested by hand in 2022, and machine-harvested in 2023 before being stored at 7°C in plastic bags with wood shavings. At each timepoint, visually healthy beets of each variety were removed from storage, washed, and cut into approximately 3-cm thick sections. Root sections were inoculated with *Botrytis cinerea, Fusarium graminearum, Penicillium vulpinum,* or with a CV8 plug as a control. There were four replications of each Variety*Pathogen combination. Inoculated beets were incubated for 24 hr before removal of agar plugs, and after one week at ambient temperature, the lesion length and depth were measured.

Table 1: Varietal differences in storage rot development in sugarbeet roots inoculated with *Botrytis cinerea, Fusarium graminearum, Penicillium vulpinum,* or CV8. Rot diameter and depths were averaged across all tested pathogens. Beet roots were harvested from a randomized complete block trial on a commercial farm in the Thumb and Bay regions of Michigan in the growing seasons 2022 and 2023.

Days postharvest		**50**			**130**					
		Diameter	**Depth**		**Diameter**	**Depth**				
2022	BTS-1065	32.4	6.4		31.1	5.5		-	-	
	BTS-1606N	38.5	8.5		33.3	6.7		-	-	
	BTS-1703	40.3	6.8		34.1	9.7		-	-	
	C-G021	38.5	7.4		33.5	7.6		-	-	
	C-G049	32.3	6.8		32.8	5.7		-	-	
	C-G675	37.3	6.1		33.4	7.6		-	-	
	C-G932NT	35.8	7.3		31.3	5.6		-	-	
	HIL-2332NT	34.5	6.7		24.9	7.1		-	-	
	HIL-2361	38.8	8.6		37.3	8.3		-	-	
	HIL-9865	38.3	10.1		33.7	6.8		-	-	
	SX-2295	39.0	6.6		29.6	4.8		-	-	
	SX-2296N	35.3	5.2		31.8	8.2		-	-	
	Std Error	2.6	1.0		4.0	1.4				
	P-value	0.4803	0.1240		0.7906	0.4320				

Days postharvest		**40**			**120**			**180**		
		Diameter	**Depth**		**Diameter**	**Depth**		**Diameter**	**Depth**	
2023	BTS1065	32.2	5.8	b-e	47.3	a-c	4.5 de	44.7	9.1	a-c
	BTS1122	28.3	7.4	a-c	48.8	a-c	6.3 b-d	41.9	8.0	a-d
	BTS1183	27.5	4.5	de	49.9	a-c	7.5 a-c	46.0	9.9	ab
	BTS197N	28.2	3.7	e	49.7	a-c	8.0 ab	36.4	6.5	c-e
	C-G049	29.4	6.7	a-d	41.7	c	8.0 ab	44.7	9.3	a-c
	C-G151	24.9	7.4	a-c	40.3	c	3.6 e	37.0	7.3	b-d
	C-G932NT	35.9	8.8	a	44.7	bc	5.7 c-e	38.1	10.6	a
	HIL2332NT	40.1	5.6	b-e	52.9	ab	6.0 b-d	43.0	5.8	de
	HIL2361	30.9	4.9	c-e	57.5	a	6.4 b-d	46.8	6.1	de
	HIL9865	32.9	7.6	ab	43.1	bc	9.2 a	39.7	7.5	b-d
	SX2295	35.0	5.2	b-e	55.1	a	5.5 c-e	38.9	4.1	e
	SX2296N	35.4	7.6	ab	49.5	a-c	5.8 c-e	42.7	7.9	b-d
	Std Error	3.5	1.0		4.3		1.0	3.9	1.1	
	P-value	0.1830	0.0080	**	0.0461	*	0.0001 **	0.4055	0.0003	**

All values were corrected for control before statistical analysis. Asterisk designations correspond to P value thresholds as follows: *P<0.05; **P<0.01; ***P<0.0001. Analyses were conducted within each timepoint and year.

Summary: There was variability in pathogen response among the twelve tested varieties, although no varieties consistently performed better or worse than others. It is interesting to note that some varieties with the largest rot diameters for one pathogen may have one of the lowest diameters for another. For example, SX-2295 had one of the deeper rot depths when inoculated with *B. cinerea,* and one of the shallower depths when inoculated with *F. graminearum* and *P. vulpinum* (Figure 2). This may be of interest for breeding programs in the future. No significant effects of pathogen on variety performance were observed in 2022 or 2023 ($P > 0.05$) (Figure 2). Across all pathogens, there were no significant differences in varietal responses in 2022, however, there were significant differences in depth at all timepoints and diameter at one timepoint in 2023 ($P < 0.05$) (Table 1). This may be because beets were hand-harvested in 2022, and machine-harvested in 2023. Future work could investigate varietal responses to pathogens after typical mechanical damage experienced during harvest and postharvest handling. At most timepoints, *Botrytis cinerea* resulted in the largest rot diameter and depth, or statistically similar to the largest measurements ($P < 0.05$). This emphasizes the importance of continuing to prioritize research on management of *Botrytis cinerea* in sugarbeet storage.

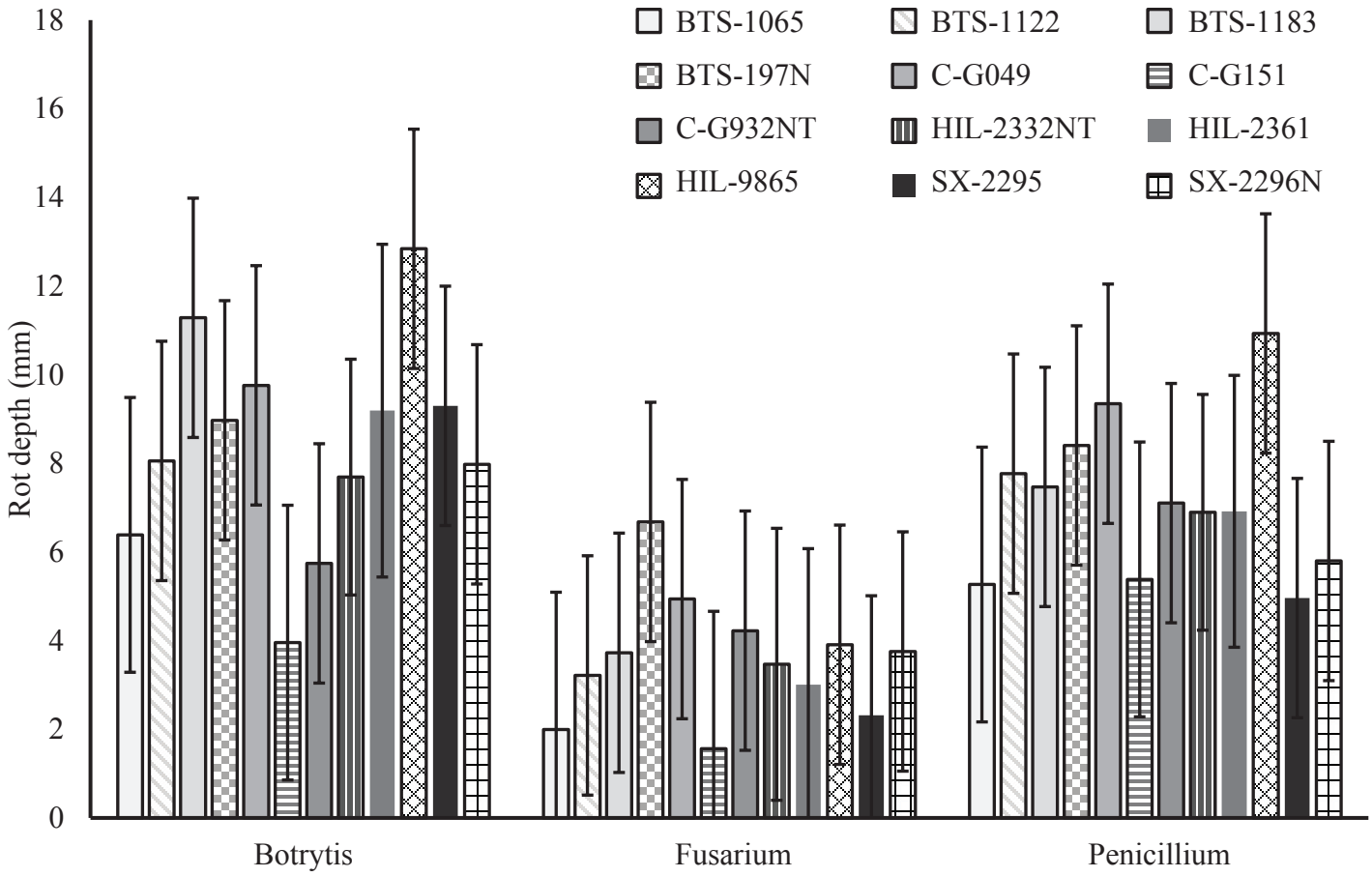

Figure 2: Varietal differences in storage rot development in sugarbeet roots inoculated with *Botrytis cinerea, Fusarium graminearum, Penicillium vulpinum* or CV8 at 120-days postharvest in 2023. Beet roots were harvested from a randomized complete block trial on a commercial farm in the Thumb and Bay regions of Michigan. All values were corrected for control before statistical analysis, and error bars represent 95% confidence interval.

Acknowledgements: This work is supported by the Michigan Sugar Company, USDA-ARS, Beet Sugar Development Foundation, and Project GREEEN. We also thank Michigan Sugar Company agronomists for their assistance in obtaining beet root samples.

"Good" vs. "Bad" Topping

Chaffin Farms, Breckenridge - 2024

Variety: A C-G233
Variety: B B-1276
Harv/Samp: 9/5/2024
Plot Size: 12 Rows x 2407 Ft
Row Spacing: 20"

Figure 1

Treatment	Gross $/A	RWSA	RWST	T/A	% Sugar	% CJP
B-1276; "Bad" Job Topping	**$1,829**	**10187**	250	**40.8**	14.6	94.8
B-1276; Good Job Topping	**$1,786**	**9869**	254	38.9	14.7	94.1
C-G233; "Bad" Job Topping	**$1,780**	**9982**	246	**40.5**	14.5	94.4
C-G233; Good Job Topping	$1,627	9202	242	37.9	14.2	93.8
Average	$1,755	9810	248	39.5	14.5	94.3
LSD 0.05	172.4	708.0	N/S (14.7)	1.5	N/S (0.66)	N/S (1.0)
CV %	4.9	3.6	3.0	1.9	2.3	0.5

Comments: Each treatment consisted of 3 replications resulting in 12 harvest strips. Three Sugar Quality samples taken from each harvest strip. The trial was harvested with a 12 row Holmer utilizing a single row of steel flails for defoiation and a standard scalping system. For both A and B varieties the GOOD Job of Topping was to the best of the operators ablility to remove ALL SugarBeet tops which may have increased the loss in tonnage due to exessive scalping. The "BAD" Job consisted of exess Dead dry leaf near the bottom of the SugarBeet crown and 2"- 4" of leaf Stem (Whiskers) remaining near the top of the SugarBeet crown and/or no scalping. (Fig.1)

Gross $/A: Calculated using the Quality Payment System Only (Not a combination of QP System and the Old System)
Bold: Results are not statistically different from top ranking treatment in each column.
N/S – not significant

Examining harvest-aid treatments for improved topping

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Location: Richville (SVREC)	**Application timings**: Preharvest (Sept. 4)
Planting Date: April 16, 2024	**Herbicides:** see treatments
Soil Type: Sandy loam	**O.M.:** 1.8 **pH:** 6.5
Replicated: 4 times	**Variety:** Crystal G049RR

Table 1. Sugarbeet leaf desiccation, regrowth, and topping efficiency, 6 days after harvest-aid treatment. Subsamples were harvested for % sugar and recoverable white sugar per ton.

Preharvest treatments[a]	Desiccation	Regrowth	Topped	Sugar	RWST
	—%—	—%—	—%—	—%—	—lb/ton—
None	0	0	75*	15.0*	262*
Defol 5 (2.4 qt) + MSO	32	0	78*	14.6*	242
Defol 5 (4.8 qt) + MSO	42	0	75*	14.0	22
Max-In Calcium (1 gal)	2	0	77*	14.5*	249*
Gramoxone 3SL (21 fl oz) + NIS	75	20*	60	14.3*	240
Sharpen (2 fl oz) + MSO + AMS	12	0	72*	14.6*	249*
Reglone (2 pt) + NIS	83*[b]	18*	62	13.8*	232
Gramoxone 3SL (21 fl oz) + Sharpen (2 fl oz) + MSO + AMS	75	17*	63	13.9	233
$LSD_{0.05}$[c]	*7*	*4*	*9*	*0.8*	*14*

[a] Methylated seed oil (MSO) was applied at 1% v/v; non-ionic surfactant (NIS) was applied at 0.25% v/v; ammonium sulfuate (AMS) was applied at 17 lb/100 gal.
[b] Values with an asterisks (*) were to the highest number.
[c] Means within a column greater than least significant difference (LSD) value are different from each other.

Summary: Effectively topping sugarbeets during early harvest has been a struggle for Michigan sugarbeet growers. To address this concern various products were applied as harvest-aids 6 d prior to topping. Sugarbeet leaf desiccation was the greatest with Reglone (diquat) (83%), 6 DAT. Desiccation with Gramoxone (paraquat) alone and with Sharpen (saflufenacil) was ~75%, 6 DAT. All other treatment provided less than 50% leaf desiccation. Defol 5 (sodium chlorate) leaf desiccation was 32 and 42% with the low and high rates, respectively. Max-In calcium had virtually no visual effect on leaf tissue and Sharpen only resulted in slight leaf speckling (12%). There was also 17-20% leaf regrowth with the Reglone and Sharpen treatments. No treatments improved the effectiveness of leaf removal from topping compared with the no preharvest treatment control. In fact, leaf removal was significantly lower (10% or more) when leaf desiccation was high, Reglone and Gramoxone treatments. All preharvest treatments with the exception of Sharpen and Max-In calcium reduced recoverable white sugar per ton by 8% or more compared with the no preharvest treatment control. In conclusion, the use of preharvest treatments were not effective in improving sugarbeet topping and other techniques or system changes will likely be needed to improve leaf removal from topping operations during early harvest.

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