MICHIGAN SUGARBEET REACh
Research & Education Advisory Council

RESEARCH RESULTS 2018

REACh/SUGARBEET ADVANCEMENT COMMITTEE LIST
2018 VOTING MEMBERSHIP

23 Voting Members

Company	Name	Terms Remaining	Expire
Michigan Sugar Company	Jim Ruhlman (5th Member)	Permanent	
	Dennis Bischer		
	Jim Stewart		
	Corey Guza		
Michigan Sugar Agriculturists (4 years)	Kerrek Griffes	1	2019
	Kevin Messing	3	2021
	Cassie Sneller	4	2022
Michigan Sugar Company District Board Members (1 year)	Darrin Siemen (Secretary)	1	2019
	Mark Sylvester (Chairman)	1	2019
	Peter Maxwell	1	2019
Michigan Sugar Company At Large Growers (3 years)	Chris Ziehm	1	2019
	Kurt Hrabal	3	2021
	Scott Roggenbuck (Treasurer)	2	2020
	Andy Shaffner (Vice President)	1	2019
Michigan State University, University of Guelph, and USDA (3 years)	Linda Hanson	2	2020
		1	2019
	Christy Sprague	1	2019
Sugar Beet Seed Company (2 years)	Rob Gerstenberger	1	2019
Agri-Business Retail (2 years)	Jacob Hecht	1	2019
Agri-Business Manufacturing (2 years)	David Reif	2	2020
Michigan Sugar Company Board of Directors (1 year)	Clay Crumbaugh	1	2019
	Kent Houghtaling	1	2019
SBA Director		Permanent	

Ex-Officio Members

Company	Name
Chairman of Board of Directors - MSC	Rick Gerstenberger
CEO of Michigan Sugar Company	Mark Flegenheimer

Updated 1-29-2018

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

UNIVERSITY of GUELPH

USDA

2018 Research Results

Table of Contents

MICHIGAN SUGARBEET REACh
Research Education Advisory Council

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MICHIGAN SUGAR

2018 Research Results

Table of Contents

Evaluate Registered and Experimental Fungicides for Control of Rhizoctonia Root Rot in Sugarbeets
Bebow, Breckenridge, MI - 2018

Trial Quality: Fair
Variety: SX-1245N
Planted: May 8
Harvested: Sep 14
Plots: 6 rows X 38 ft, 4 reps
Row Spacing: 22 inches

Soil Info: Sandy Clay Loam
% OM: 2.7 **pH:** 6.4 **CEC:** 13.3
P: above opt **K:** above opt
Mn: high **B:** med
Added N: 140 lbs
Prev Crop: Soybeans

Rhizoc Level: Very High
Cerc Control: Good
Problems: High disease level
Seeding Rate: 4.5 inches
Rainfall: 20.5 inches

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	Dead Beets / 100 ft		Vigor Rating* 0-10		Beets / 100 ft	
				Avg		Avg		3-Sep	11-Jun
23	Quadris Quadris	10 fl oz 14.25 fl oz	In-Fur 10-12 lf	**29.5**	**f**	**7.3**	**a**	220	258
3	Quadris	13 fl oz	In-Fur	**30.8**	**ef**	**7.1**	**abc**	188	227
21	Quadris Quadris	10 fl oz 14.25 fl oz	In-Fur 4-6 lf	**36.4**	**def**	**7.1**	**abc**	195	244
10	Xanthion A Xanthion B	1.8 fl oz 9 fl oz	In-Fur In-Fur	**46.4**	**c-f**	**6.9**	**a-f**	183	240
27	Gem SC	3.6 fl oz	8 lf	**46.7**	**b-f**	6.1	ij	190	238
22	Quadris Quadris	10 fl oz 14.25 fl oz	In-Fur 8 lf	**47.0**	**b-f**	**7.2**	**ab**	188	246
5	Moncut SC	24 fl oz	In-Fur	**48.1**	**b-f**	6.7	b-j	188	241
31	Propulse	13.6 fl oz	8 lf	**48.3**	**b-f**	**6.7**	**a-h**	174	226
20	Quadris	14.25 fl oz	10-12 lf	**49.8**	**b-f**	6.6	b-j	172	230
18	Quadris	14.25 fl oz	4-6 lf	**52.0**	**b-f**	**6.9**	**a-f**	194	259
25	Moncut SC	24 fl oz	8 lf	**52.5**	**b-f**	**6.9**	**a-f**	206	268
6	Proline 480 SC	5.7 fl oz	In-Fur	**54.5**	**b-f**	**7.0**	**a-d**	196	254
12	Propulse	10 fl oz	In-Fur	**56.1**	**b-f**	**6.7**	**a-i**	164	231
14	Serenade ASO Quadris	2 qt 10 fl oz	In-Fur In-Fur	**56.6**	**b-f**	**6.8**	**a-h**	193	262
24	Moncut SC	18 fl oz	8 lf	**58.1**	**b-f**	**6.9**	**a-e**	197	259
2	Quadris	10 fl oz	In-Fur	**58.6**	**b-f**	**6.8**	**a-g**	186	258

Means followed by the same letter are not significantly different. Duncans New MRT 5%.

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

Net $/A: Assume a $40 beet payment and trial average RWST with fungicide costs subtracted off.
Bold: Results are not statistically different from top-ranking treatment in each column.

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Evaluate Registered and Experimental Fungicides for Control of Rhizoctonia Root Rot in Sugarbeets
Bebow, Breckenridge, MI - 2018

No.	Treatment	Rate/A	Applic Timing	Dead Beets / 100 ft		Vigor Rating* 0-10		Beets / 100 ft	
				Avg		Avg		3-Sep	11-Jun
15	Proline 480 SC Quadris	5.7 fl oz 10 fl oz	In-Fur In-Fur	**60.3**	**b-f**	6.6	b-j	179	251
9	Priaxor	8 fl oz	In-Fur	**60.3**	**b-f**	6.4	c-j	173	251
28	Headline SC	12 fl oz	8 lf	**61.9**	**b-f**	6.1	hij	168	238
13	Propulse	13.6 fl oz	In-Fur	**63.0**	**b-f**	**6.7**	**a-h**	169	240
8	Headline SC	12 fl oz	In-Fur	64.1	b-e	6.3	f-j	153	227
30	Propulse	13.6 fl oz	8 lf	65.5	bcd	**6.7**	**a-h**	170	255
4	Moncut SC	18 fl oz	In-Fur	67.6	bcd	6.5	b-j	165	232
19	Quadris	14.25 fl oz	8 lf	68.3	bcd	6.6	b-j	164	247
1	Quadris	7 fl oz	In-Fur	69.1	a-d	6.6	b-j	170	247
7	Gem SC	3.6 fl oz	In-Fur	69.8	a-d	6.3	e-j	174	258
26	Proline 480 SC	5.7 fl oz	8 lf	71.7	abc	6.4	d-j	182	274
29	Priaxor	8 fl oz	8 lf	73.6	abc	6.6	b-j	171	247
34	Untreated			100.5	a	5.0	k	146	253

Average	59.56	6.60	178.5	247.2
LSD 5%	27.30	0.51	n.s.	n.s.
CV %	32.7	5.6	18.8	11.9

Means followed by the same letter are not significantly different. Duncans New MRT 5%.

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

Comments: Quadris, Moncut, Proline, Gem, Headline, Priaxor and other fungicides were evaluated for control of Rhizoctonia root rot (*Rhizoctonia solani AG 2-2 IIIB*) in this small plot replicated trial. The disease pressure was extremely high and overwhelmed even the best treatments. Due to the high disease level and field variation sugarbeet yield and quality measurements are not reported. As in past years, Quadris at 10 or more fl oz/A applied In-furrow in a 3.5 inch T-band followed by a foliar Quadris application provided the best overall results. Quadris applied In-furrow at 7 fl oz/A failed to control the disease. The application timing of Quadris banded over the row at 14.25 fl oz/A did not seem to matter. Several other fungicide treatments provided adequate control, considering the high level of disease.

Net $/A: Assume a $40 beet payment and trial average RWST with fungicide costs subtracted off.
Bold: Results are not statistically different from top-ranking treatment in each column.

Evaluate the Efficacy of Quadris In-furrow when applied with Different Water Volumes
Guza, Fairgrove, MI - 2018

Trial Quality: Fair
Variety: SX-1245N
Planted: May 2
Harvested: Oct 4
Plots: 6 rows X 38 ft, 4 reps
Row Spacing: 22 inches

Soil Info: Sandy Loam
% OM: 3.7 **pH:** 7.6 **CEC:** 14.7
P: above opt **K:** above opt
Mn: high **B:** med
Added N: 135 lbs
Prev Crop: Wheat

Rhizoc Level: Low-Moderate
Cerc Control: Good
Problems: None
Seeding Rate: 4.5 inches
Rainfall: 14.1 inches

Application: Monosem 6-row Agronomy Planter, IF - 3.5" band

No.	Treatment	Rate/A	GPA	Applic Timing	Dead Beets / 100 ft	Net $/A	Vigor Rating*** 0-10	Beets / 100 ft	
					29-Aug		31-Jul	22-May	26-Jul
1	Quadris	7 fl oz	9.9	In-Fur	2.4	$1,544	8.2	233	228
6	Quadris	13 fl oz	7.1	In-Fur	2.7	$1,561	8.1	233	219
9	Quadris	13 fl oz	5.5	In-Fur	2.8	$1,515	8.1	227	217
8	Quadris	10 fl oz	5.5	In-Fur	3	$1,514	8.0	240	224
5	Quadris	10 fl oz	7.1	In-Fur	3.3	$1,527	7.9	233	231
4	Quadris	7 fl oz	7.1	In-Fur	3.5	$1,551	8.2	233	231
2	Quadris	10 fl oz	9.9	In-Fur	3.5	$1,564	8.0	231	225
7	Quadris	7 fl oz	5.5	In-Fur	4.4	$1,526	8.0	233	214
3	Quadris	13 fl oz	9.9	In-Fur	4.4	$1,492	7.9	222	217
10	Untreated				12.6	$1,353	7.7	232	227
Average					4.26	$1,514.8	7.98	231.8	223.5
LSD 5%					n.s.	n.s	n.s.	n.s.	n.s.
CV %					133.46	7.2	3.1	5.8	5.4

Means followed by the same letter are not significantly different. Duncans New MRT 5%.

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

Net $/A: Assume a $40 beet payment and trial average RWST with fungicide costs subtracted off.
Bold: Results are not statistically different from top-ranking treatment in each column.

Evaluate the Efficacy of Quadris In-furrow when applied with Different Water Volumes

Guza, Fairgrove, MI - 2018

No.	Treatment	Rate/A	GPA	Applic Timing	Dead Beets / 100 ft	Net $/A	RWSA	RWST	T/A	% SUC	% CJP
					29-Aug						
1	Quadris	7 fl oz	9.9	In-Fur	2.4	$1,544	9228	238	38.8	16.3	94.8
6	Quadris	13 fl oz	7.1	In-Fur	2.7	$1,561	9368	238	39.3	16.3	94.9
9	Quadris	13 fl oz	5.5	In-Fur	2.8	$1,515	9093	243	37.4	16.4	95.4
8	Quadris	10 fl oz	5.5	In-Fur	3	$1,514	9070	239	38.0	16.2	95.2
5	Quadris	10 fl oz	7.1	In-Fur	3.3	$1,527	9274	243	38.2	16.3	95.1
4	Quadris	7 fl oz	7.1	In-Fur	3.5	$1,551	9271	237	39.2	16.2	95.0
2	Quadris	10 fl oz	9.9	In-Fur	3.5	$1,564	9365	243	38.6	16.5	95.0
7	Quadris	7 fl oz	5.5	In-Fur	4.4	$1,526	9122	237	38.6	16.1	95.2
3	Quadris	13 fl oz	9.9	In-Fur	4.4	$1,492	8958	239	37.5	16.2	95.3
10	Untreated				12.6	$1,353	8044	226	35.6	15.6	94.7
Average					4.26	$1,514.8	9107.0	238.0	38.2	16.2	95.0
LSD 5%					n.s.	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.
CV %					133.5	3.1	8.1	4.61	5.7	4.0	0.4

Means followed by the same letter are not significantly different. Duncans New MRT 5%.

Comments: Quadris was applied In-furrow at 7, 10 and 13 fl oz/A and in 5.5, 7.1 and 9.9 gallons of water per acre in this Rhizoctonia, (Rhizoctonia solani AG 2-2 IIIB) root rot trial. Two trials were conducted in 2018. There were no significant differences between treatments for disease control, yield or quality. This trial will be repeated in 2019.

Net $/A: Assume a $40 beet payment and trial average RWST with fungicide costs subtracted off.
Bold: Results are not statistically different from top-ranking treatment in each column.

Evaluate the Efficacy of Quadris In-furrow when applied with Different Water Volumes
Wackerle, Pinconning, MI -2018

Trial Quality: Fair
Variety: SX-1245N
Planted: May 14
Harvested: Sep 18
Plots: 6 rows X 38 ft, 4 reps
Row Spacing: 22 inches

Soil Info: Sandy Loam
% OM: 5.3 **pH:** 7.1 **CEC:** 15.9
P: above opt **K:** above opt
Mn: med **B:** med
Added N: 130 lbs
Prev Crop: Wheat

Rhizoc Level: Medium-High
Cerc Control: Good
Problems: None
Seeding Rate: 4.5 inches
Rainfall: 11.6 inches

Application: Monosem 6-row Agronomy Planter, In-Fur, 3.5" band

No.	Treatment	Rate/A	GPA	Applic Timing	Dead B / 100 ft	Net $/A	Vigor Rating*** 0-10	Beets / 100 ft	
					21-Aug		5-Sep	2-Jun	1-Aug
7	Quadris	7 fl oz	5.5	In- Fur	**18.3 b**	**$1,413 a**	7.4	258 b	232
6	Quadris	13 fl oz	7.1	In- Fur	**18.5 b**	**$1,395 a**	7.5	255 b	238
8	Quadris	10 fl oz	5.5	In- Fur	**20.8 b**	**$1,336 a**	7.3	**290 a**	243
3	Quadris	13 fl oz	9.9	In- Fur	**23 b**	**$1,415 a**	7.6	**253 a**	222
9	Quadris	13 fl oz	5.5	In- Fur	**23.2 b**	**$1,410 a**	7.4	263 b	224
5	Quadris	10 fl oz	7.1	In- Fur	**24.3 b**	**$1,402 a**	7.3	282 b	253
4	Quadris	7 fl oz	7.1	In- Fur	**24.3 b**	**$1,332 a**	7.4	**253 a**	233
2	Quadris	10 fl oz	9.9	In- Fur	**26.8 b**	**$1,345 a**	7.4	286 b	245
1	Quadris	7 fl oz	9.9	In- Fur	**26.8 b**	**$1,369 a**	7.3	260 b	219
10	Untreated				47.3 a	$1,055 b	7.1	**287 a**	244

Average	25.35	$1,347.1	7.36	268.6	235.1
LSD 5%	14.61	11.5	n.s.	13.6	n.s.
CV %	49.56	179.7	0.5	4.3	8.3

Means followed by the same letter are not significantly different. Duncans New MRT 5%.

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

Net $/A: Assume a $40 beet payment and trial average RWST with fungicide costs subtracted off.
Bold: Results are not statistically different from top-ranking treatment in each column.

Evaluate the Efficacy of Quadris In-furrow when applied with Different Water Volumes
Wackerle, Pinconning, MI - 2018

No.	Treatment	Rate/A	GPA	Applic Timing	Net $/A	RWSA	RWST	T/A	% SUC	% CJP
7	Quadris	7 fl oz	5.5	In-Fur	**$1,413 a**	**7566 a**	**214 a**	**35.3 a**	**14.9 a**	94.3
6	Quadris	13 fl oz	7.1	In-Fur	**$1,395 a**	**7502 a**	**215 a**	**34.9 a**	**15.0 a**	94.2
8	Quadris	10 fl oz	5.5	In-Fur	**$1,336 a**	**7170 a**	**214 a**	**33.5 a**	**14.9 a**	94.3
3	Quadris	13 fl oz	9.9	In-Fur	**$1,415 a**	**7608 a**	**215 a**	**35.4 a**	**14.9 a**	94.5
9	Quadris	13 fl oz	5.5	In-Fur	**$1,410 a**	**7584 a**	**215 a**	**35.2 a**	**15.0 a**	94.2
5	Quadris	10 fl oz	7.1	In-Fur	**$1,402 a**	**7523 a**	**213 a**	**35.2 a**	**14.8 a**	94.4
4	Quadris	7 fl oz	7.1	In-Fur	**$1,332 a**	**7134 a**	**215 a**	**33.1 a**	**15.0 a**	94.2
2	Quadris	10 fl oz	9.9	In-Fur	**$1,345 a**	**7221 a**	**214 a**	**33.7 a**	**14.9 a**	94.3
1	Quadris	7 fl oz	9.9	In-Fur	**$1,369 a**	**7331 a**	**214 a**	**34.2 a**	**14.9 a**	94.3
10	Untreated				$1,055 b	5620 b	201 b	28.0 b	14.2 b	93.8

Average	$1,347.2	7225.8	213.1	33.86	14.87	94.25
LSD 5%	197.7	956.9	7.1	4.28	0.45	n.s.
CV %	11.5	11.4	2.9	10.9	2.6	0.4

Means followed by the same letter are not significantly different. Duncans New MRT 5%.

Comments: Quadris was applied In-furrow at 7, 10 and 13 fl oz/A and in 5.5, 7.1 and 9.9 gallons of water per acre in this Rhizoctonia, (*Rhizoctonia solani* AG IIIB) root rot trial. Two trials were conducted in 2018. There were no significant differences between treatments for disease control, yield or quality. This trial will be repeated in 2019.

Net $/A: Assume a $40 beet payment and trial average RWST with fungicide costs subtracted off.
Bold: Results are not statistically different from top-ranking treatment in each column.

Evaluate Broadcast Quadris Applications for Control of Rhizoctonia Root Rot in Sugarbeets
Maurer, Ruth, MI - 2018

Trial Quality: Fair-Good
Variety: B-12RR2N
Planted: May 24
Harvested: Oct 11
Plots: 6 rows X 38 ft, 4 reps
Row Spacing: 22 inches

Soil Info: Loam
% OM: 3.2 **pH:** 7.3 **CEC:** 12.6
P: above opt **K:** above opt
Mn: high **B:** med
Added N: 135 lbs
Prev Crop: Wheat

Rhizoc Level: Low
Cerc Control: Good
Problems: None
Seeding Rate: 4.5 inches
Rainfall: 16.4 inches

Application: JD 3520 tractor mounted plot sprayer, compressed air, 30 psi, 15.3 gpa - Foliar, 7" band

No.	Treatment	Rate/A	Applic Timing	Applic Date	Dead Beets / 100 ft	Net $/A	Vigor Rating*** 0-10	Beets / 100 ft
					29-Aug		29-Aug	18-Aug
1	Quadris Fl	14.25	8 lf - band	29-Jun	0.6	$1,327	7.5	176
4	Quadris Fl	40	8 lf - band	29-Jun	1.1	$1,137	7.4	180
2	Quadris Fl	15.5	8 lf - band	29-Jun	1.7	$1,200	7.8	173
22	UTC				2.0	$1,241	7.7	169
3	Quadris Fl	25	8 lf - band	29-Jun	2.0	$1,154	7.1	162
15	Quadris Fl	25	12 lf - broad	18-Jul	2.3	$1,317	8.0	175
18	Quadris Fl	15.5	18 lf - broad	31-Jul	2.6	$1,172	7.5	172
19	Quadris Fl	25	18 lf - broad	31-Jul	3.2	$1,192	7.5	172
7	Quadris Fl	25	8 lf - broad	29-Jun	3.4	$1,256	7.6	176
16	Quadris Fl	40	12 lf - broad	29-Jun	4.0	$1,201	8.0	172
11	Quadris Fl	25	12 lf - band	18-Jul	4.0	$1,237	7.7	175
14	Quadris Fl	15.5	12 lf - broad	18-Jul	4.3	$1,172	7.8	174
17	Quadris Fl	14.25	18 lf - broad	31-Jul	4.6	$1,205	7.6	173
20	Quadris Fl	40	18 lf - broad	31-Jul	4.9	$1,245	7.7	185
6	Quadris Fl	15.5	8 lf - broad	29-Jun	5.7	$1,201	7.5	169
13	Quadris Fl	14.25	12 lf - broad	18-Jul	5.7	$1,139	7.3	162
5	Quadris Fl	14.25	8 lf - broad	29-Jun	6.0	$1,168	7.2	161
10	Quadris Fl	15.5	12 lf - band	18-Jul	8.0	$1,174	7.8	182
21	UTC				8.3	$1,297	7.8	180
12	Quadris Fl	40	12 lf - band	18-Jul	8.3	$1,153	7.8	169
8	Quadris Fl	40	8 lf - broad	29-Jun	9.5	$1,132	7.7	182
9	Quadris Fl	14.25	12 lf - band	18-Jul	9.5	$1,138	7.6	181

Average	4.64	$1,202.7	7.62	173.6
LSD 5%	n.s.	n.s.	n.s.	n.s.
CV %	99.3	11.3	5.2	9.4

Means followed by the same letter are not significantly different. Duncans New MRT 5%.

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

Net $/A: Assume a $40 beet payment and trial average RWST with fungicide costs subtracted off.
Bold: Results are not statistically different from top-ranking treatment in each column.

Evaluate Broadcast Quadris Applications for Control of Rhizoctonia

Maurer, Ruth, MI - 2018

No.	Treatment	Rate/A	Applic Timing	Applic Date	Dead Beets / 100	Net $/A	RWSA	RWST	T/A	% SUC	% CJP
					29-Aug						
1	Quadris Fl	14.25	8 lf - band	29-Jun	0.6	$1,327	7811	241	32.3	16.2	95.6
4	Quadris Fl	40	8 lf - band	29-Jun	1.1	$1,137	6867	229	30.0	15.5	95.6
2	Quadris Fl	15.5	8 lf - band	29-Jun	1.7	$1,200	7078	235	29.9	15.9	95.8
22	UTC				2.0	$1,241	7217	237	30.6	16.0	95.8
3	Quadris Fl	25	8 lf - band	29-Jun	2.0	$1,154	6869	233	29.5	15.7	95.9
15	Quadris Fl	25	12 lf - broad	18-Jul	2.3	$1,317	7815	240	32.5	16.0	95.8
18	Quadris Fl	15.5	18 lf - broad	31-Jul	2.6	$1,172	6917	236	29.4	15.9	95.5
19	Quadris Fl	25	18 lf - broad	31-Jul	3.2	$1,192	7092	228	31.2	15.6	95.5
7	Quadris Fl	25	8 lf - broad	29-Jun	3.4	$1,256	7462	235	31.6	15.9	95.5
16	Quadris Fl	40	12 lf - broad	29-Jun	4.0	$1,201	7242	227	32.0	15.5	95.6
11	Quadris Fl	25	12 lf - band	18-Jul	4.0	$1,237	7352	233	31.5	15.9	95.6
14	Quadris Fl	15.5	12 lf - broad	18-Jul	4.3	$1,172	6912	222	31.0	15.2	95.5
17	Quadris Fl	14.25	18 lf - broad	31-Jul	4.6	$1,205	7101	222	31.9	15.0	95.6
20	Quadris Fl	40	18 lf - broad	31-Jul	4.9	$1,245	7498	240	31.3	16.1	95.7
6	Quadris Fl	15.5	8 lf - broad	29-Jun	5.7	$1,201	7085	239	29.7	16.2	95.7
13	Quadris Fl	14.25	12 lf - broad	18-Jul	5.7	$1,139	6720	238	28.3	16.0	95.7
5	Quadris Fl	14.25	8 lf - broad	29-Jun	6.0	$1,168	6887	237	28.9	16.0	95.7
10	Quadris Fl	15.5	12 lf - band	18-Jul	8.0	$1,174	6928	219	31.7	15.0	95.4
21	UTC				8.3	$1,297	7541	235	31.9	15.9	96.1
12	Quadris Fl	40	12 lf - band	18-Jul	8.3	$1,153	6964	233	29.9	15.8	95.8
8	Quadris Fl	40	8 lf - broad	29-Jun	9.5	$1,132	6839	225	30.5	15.4	95.7
9	Quadris Fl	14.25	12 lf - band	18-Jul	9.5	$1,138	6709	231	29.0	15.8	95.5
Average					4.64	$1,202.7	$7,132.0	$232.6	30.66	15.74	95.67
LSD 5%					n.s.	n.s.	n.s	n.s.	n.s.	n.s.	n.s.
CV %					99.3	11.3	11.1	5.15	9.8	4.2	0.3

Means followed by the same letter are not significantly different. Duncans New MRT 5%.

Comments: Quadris was applied at the 8 lf, 12 lf and 18 lf stage as banded and broadcast treatments for Rhizoctonia *(Rhizoctonia solani AG IIIB)* root rot control in this small plot replicated trial. The disease level was low. The Quadris label rate is based on band applications so to keep the same effective rate, broadcast rates were increased significantly. There were no significant differences with respect to disease control or yield. This trial will be repeated in 2019.

Net $/A: Assume a $40 beet payment and trial average RWST with fungicide costs subtracted off.
Bold: Results are not statistically different from top-ranking treatment in each column.

Control of Rhizoctonia Root Rot with Serenade ASO Tank Mix Treatments
Wackerle, Pinconning, MI - 2018

Trial Quality: Good
Variety: SX-1245N
Planted: May 14
Harvested: Sept 18
Plots: 6 Rows X 38 ft, 4 reps
Row Spacing: 22 inches

Soil Info: Sandy Loam
% OM: 5.3 **pH:** 7.1 **CEC:** 15.9
P: above opt **K:** above opt
Mn: med **B:** med
Added N: 130 lbs
Prev Crop: Wheat

Rhizoc Level: Low-Moderate
Cerc Control: Good
Problems: None
Seeding Rate: 4.5 inches
Rainfall: 11.6 inches

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	Dead Beets / 100 ft	Net $/A	Vigor Rating*** 0-10 Avg	Beets / 100 ft	
				23-Jul			2-Jun	1-Aug
4	Serenade ASO	2 qt	In-Fur	**3.2 b**	$1,310	**8.4 a**	289	255
	Propulse	10 fl oz	In-Fur					
	Quadris Fl	14.25	8 lf					
3	Serenade ASO	2 qt	In-Fur	**3.7 b**	$1,256	**8.3 a**	294	267
	Proline 480 SC	5.7 fl	In-Fur					
	Quadris Fl	14.25	8 lf					
2	Serenade ASO	2 qt	In-Fur	**6.2 b**	$1,182	**8.2 a**	298	264
	Quadris Fl	9.2 fl oz	In-Fur					
	Proline 480 SC	5.7 fl oz	8 lf					
1	Untreated			15.3 a	$1,013	7.7 b	284	245
Average				7.10	$1,190.1	8.10	291.2	257.9
LSD 5%				4.50	n.s.	0.41	n.s.	n.s.
CV %				44.6	12.8	3.2	6.2	7.2

Means followed by the same letter are not significantly different. Duncans New MRT 5%.

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

Net $/A: Assume a $40 beet payment and trial average RWST with fungicide costs subtracted off.
Bold: Results are not statistically different from top-ranking treatment in each column.

Control of Rhizoctonia Root Rot with Serenade ASO Tank Mix Treatments
Wackerle, Pinconning, MI - 2018

No.	Treatment	Rate/A	Applic Timing	Dead Beets / 100 ft 23-Jul	Net $/A	RWSA	RWST	T/A	% SUC	% CJP
4	Serenade ASO	2 qt	In-Fur	**3.2 b**	$1,310	**7289 a**	**212 ab**	**34.4 a**	**14.7 ab**	94.5
	Propulse	10 fl oz	In-Fur							
	Quadris Fl	14.25	8 lf							
3	Serenade ASO	2 qt	In-Fur	**3.7 b**	$1,256	**6925 a**	**214 a**	**32.4 a**	**14.8 a**	94.6
	Proline 480 SC	5.7 fl	In-Fur							
	Quadris Fl	14.25	8 lf							
2	Serenade ASO	2 qt	In-Fur	**6.2 b**	$1,182	**6504 ab**	**219 a**	**29.6 ab**	**15.2 a**	94.6
	Quadris Fl	9.2 fl oz	In-Fur							
	Proline 480 SC	5.7 fl oz	8 lf							
	Untreated			15.3 a	$1,013	5374 b	199 b	26.9 b	14.0 b	94.2
Average				7.10	$1,190.3	6522.8	211.0	30.82	14.67	94.47
LSD 5%				4.50	n.s.	1270.4	12.7	5.22	0.73	n.s.
CV %				44.6	12.8	12.4	3.9	10.8	3.2	0.3

Means followed by the same letter are not significantly different. Duncans New MRT 5%.

Comments: Serenade ASO biological fungicide (*Bacillis subtillis* strain), tank mixed with Quadris, Proline and Propulse, was evaluated for Rhizoctonia (*Rhizoctonia solani* AG 2-2 IIIB) root rot control in this small plot replicated trial. The disease level was low to moderate. There were no differences between treatments with respect to disease control, however, all of the treatments were an improvement over the untreated check.

Net $/A: Assume a $40 beet payment and trial average RWST with fungicide costs subtracted off.
Bold: Results are not statistically different from top-ranking treatment in each column.

Evaluate Moncut SC Fungicide for Control of *Rhizoctonia solani* AG 2-2 IIIB in Sugarbeets
Bebow, Breckenridge, MI - 2018

Trial Quality: Fair-Good
Variety: SX-1245N
Planted: May 8
Harvested: Sept 14
Plots: 6 rows X 38 ft, 4 reps
Row Spacing: 22 inches

Soil Info: Sandy Clay Loam
% OM: 2.7 **pH:** 6.4 **CEC:** 13.3
P: above opt **K:** above opt
Mn: high **B:** med
Added N: 140 lbs
Prev Crop: Soybeans

Rhizoc Level: High
Cerc Control: Good
Problems: Row to row variability
Seeding Rate: 4.5 inches
Rainfall: 20.5 inches

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	Dead Beets / 100 ft		Vigor Rating* 0-10		Beets / 100 ft	
				Avg		Avg		11-Jul	3-Sep
5	Quadris Quadris	10 fl oz 14.3 fl oz	In- Fur 8 lf	**47.0**	**b**	**7.2**	**a**	246	188
3	Moncut SC	24 fl oz	In- Fur	**48.1**	**b**	**6.7**	**ab**	241	188
7	Moncut SC	24 fl oz	8 lf	**52.5**	**b**	**6.9**	**ab**	268	206
6	Moncut SC	18 fl oz	8 lf	**58.1**	**b**	**6.9**	**ab**	259	197
1	Quadris	10 fl oz	In-Fur	**58.6**	**b**	**6.8**	**ab**	258	186
2	Moncut SC	18 fl oz	In-Fur	**67.6**	**b**	6.5	b	232	165
4	Quadris	14.3 fl oz	8 lf	**68.3**	**b**	**6.6**	**ab**	247	164
8	Untreated			100.6	a	5.0	c	253	146
Average				62.59		6.56		250.2	180.1
LSD 5%				29.38		0.53		n.s.	n.s.
CV %				31.92		5.5		11.9	17.2

Means followed by the same letter are not significantly different. Duncans New MRT 5%.
*** Vigor:** 0 to 10 ratings, 10 is best

Comments: Moncut SC was compared to Quadris for control of Rhizoctonia (*Rhizoctonia solani* AG 2-2 IIIB) root rot at 2 locations in 2018. The disease level was very high at the Bebow site and low to moderate at the Wackerle location. Overall, Moncut compared favorably to Quadris and all fungicide treatments were an improvement over the untreated check plots. At the Breckenridge location yield and quality data is not included due to a high level of variation among plots. We have been evaluating Moncut for several years because the parent company is pursuing a sugarbeet label for Moncut. Over time, Moncut has performed nearly as well as Quadris and could be a replacement if resistance or other problems occur with Quadris. Moncut is an SDHI fungicide and Quadris is a strobilurin fungicide.

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

Evaluate Moncut SC Fungicide for Control of *Rhizoctonia solani* AG 2-2 IIIB in Sugarbeets
Wackerle, Pinconning, MI - 2018

Trial Quality: Fair-Good
Variety: B-12RR2N
Planted: May 14
Harvested: Sept 18
Plots: 6 rows X 38 ft, 4 reps
Row Spacing: 22 inches

Soil Info: Sandy Loam
% OM: 5.3 **pH:** 7.1 **CEC:** 15.9
P: above opt **K:** above opt
Mn: med **B:** med
Added N: 130 lbs
Prev Crop: Wheat

Rhizoc Level: Low to Moderate
Cerc Control: Good
Problems: None
Seeding Rate: 4.5 inches
Rainfall: 11.6 inches

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

No.	Treatment	Rate/A	Applic Timing	Dead Beets / 100 ft	Vigor Rating** 0-10	Beets / 100 ft		RWSA
				3-Aug	Avg	2-Jun	1-Aug	
3	Quadris	9 fl oz	In-Fur	**5.5 b**	8.2 ab	**275 a**	**258 a**	6729
2	Moncut SC	25 fl oz	In-Fur	**6.0 b**	8.4 a	**269 a**	**258 a**	6539
	Preference	0.13%	In-Fur					
1	Untreated check			10.8 a	**7.5 c**	227 b	206 b	6225

Average	7.43	8.03	257.0	240.7	6497.7
LSD 5%	3.54	0.43	27.5	26.4	n.s.
CV %	37.34	3.6	7.4	7.5	8.8

Means followed by the same letter are not significantly different. Duncans New MRT 5%.
**** Vigor:** 0 to 10 ratings, 10 is best

Comments: Moncut SC was compared to Quadris for control of Rhizoctonia (*Rhizoctonia solani* AG 2-2 IIIB) root rot at 2 locations in 2018. The disease level was very high at the Bebow site and low to moderate at the Wackerle location. Overall, Moncut compared favorably to Quadris and all fungicide treatments were an improvement over the untreated check plots. At the Breckenridge location yield and quality data is not included due to a high level of variation among plots. We have been evaluating Moncut for several years because the parent company is pursuing a sugarbeet label for Moncut. Over time, Moncut has performed nearly as well as Quadris and could be a replacement if resistance or other problems with Quadris. Moncut is an SDHI fungicide and Quadris is a strobilurin fungicide.

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

Rhizoctonia Root Rot Control with an Experimental SDHI Fungicide

Wackerle, Pinconning, MI - 2018

Trial Quality: Good
Variety: B-12RR2N
Planted: May 14
Harvested: Sept 18
Plots: 6 Rows X 38 ft, 4 reps
Row Spacing: 22 inches

Soil Info: Sandy Loam
% OM: 5.3 **pH:** 7.1 **CEC:** 15.9
P: above opt **K:** above opt
Mn: med **B:** med
Added N: 130 lbs
Prev Crop: Wheat

Rhizoc Level: Low-Moderate
Cerc Control: Good
Problems: None
Seeding Rate: 4.5 inches
Rainfall: 11.6 inches

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	Dead Beets / 100 ft	$/A	Vigor Rating*** 0-10 Avg	Beets / 100 ft	
				23-Jul			2-Jun	1-Aug
3	Exp. SDHI Fungicide	2.3 fl oz	In-Fur	**4.5 b**	$1,282	**8.1 ab**	220 b	212 b
	NIS*	0.125%	In-Fur					
2	Exp. SDHI Fungicide	3.1 fl oz	In-Fur	**5.3 b**	$1,203	7.8 bc	234 b	217 b
	NIS*	0.125%	In-Fur					
6	Quadris Fl	9 fl oz	In-Fur	**5.5 b**	$1,270	**8.2 ab**	**275 a**	**258 a**
4	Exp. SDHI Fungicide	2.3 fl oz	In-Fur	**5.8 b**	$1,322	**8.1 ab**	**264 a**	**252 a**
	NIS*	0.125%	In-Fur					
	Moncut SC	25 floz	In-Fur					
5	Moncut SC	25 fl oz	In-Fur	**6.0 b**	1235	**8.4 ab**	**269 a**	**258 a**
	NIS*	0.125%	In-Fur					
1	Untreated			10.8 a	$1,175	7.5 c	227 b	206 b

Average	6.29	$1,247.8	8.01	248.1	234.1
LSD 5%	3.54	n.s.	0.43	27.5	26.4
CV %	37.3	8.8	3.6	7.4	7.5

Means followed by the same letter are not significantly different. Duncans New MRT 5%.
* NIS: Preference
***** Vigor:** 0 to 10 ratings, 10 is best

$/A: Assume a $40 beet payment and trial average RWST
Bold: Results are not statistically different from top-ranking treatment in each column.

Rhizoctonia Root Rot Control with an Experimental SDHI Fungicide

Wackerle, Pinconning, MI - 2018

No.	Treatment	Rate/A	Applic Timing	$/A	RWSA	RWST	T/A	% SUC	% CJP
3	Exp. SDHI Fungicide NIS*	2.3 fl oz 0.125%	In-Fur In-Fur	$1,282	6789	208	32.6	14.5	94.2
2	Exp. SDHI Fungicide NIS*	3.1 fl oz 0.125%	In-Fur In-Fur	$1,203	6371	215	29.6	14.9	94.6
6	Quadris Fl	9 fl oz	In-Fur	$1,270	6729	213	31.6	14.7	94.6
4	Exp. SDHI Fungicide NIS* Moncut SC	2.3 fl oz 0.125% 25 floz	In-Fur In-Fur In-Fur	$1,322	7000	213	32.9	14.8	94.4
5	Moncut SC NIS*	25 fl oz 0.125%	In-Fur In-Fur	$1,235	6539	210	31.2	14.6	94.4
1	Untreated			$1,175	6225	213	29.3	14.8	94.5

Average	$1,247.8	6609.0	211.9	31.20	14.73	94.46
LSD 5%	n.s.	n.s.	n.s.	n.s.	n.s	n.s.
CV %	8.8	8.8	3.48	6.9	3.0	0.3

Means followed by the same letter are not significantly different. Duncans New MRT 5%.

*NIS: Preference

Comments: An Experimental SDHI fungicide from Nichino Americas was evaluated for Rhizoctonia *(Rhizoctonia solani AG 2-2 IIIB)* root rot control and compared to Quadris and Moncut. The disease level was low to moderate. Overall, the SDHI compared favorably to Quadris and Moncut and was an improvement over the untreated check plots.

$/A: Assume a $40 beet payment and trial average RWST

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

Evaluation of in-furrow and banded fungicides treatments to manage Rhizoctonia root and crown rot of sugar beet

Jaime Willbur and Chris Bloomingdale, Michigan State University

Location: Frankenmuth (SVREC)	**Treatment Timings:** In-Furrow & Banded at 6-8 leaves
Planting Dates: April 26, 2018	**Pesticides:** see table
Soil Type: Loam	**O.M.:** 5.0 **pH:** 7.5
Replicates: 4	**Variety:** C-G351NT

Table 1. Disease index (root rating at harvest), seasonal plant loss, and yield parameters of fungicide programs.

No.	Treatment, Rate/A	Application Type	Disease Index (%)[a,b]	Total Plant Loss (%)	Yield (t/A)	Sugar (%)	RWST
1	Serenade ASO 2 qt Quadris 13.9 fl oz Proline 480SC 5.7 oz	In-Furrow, In-Furrow, Banded	16.1 c	17.3 d	13.9 a	12.7	171.3
2	Experimental 12.8 fl oz Quadris 13.9 fl oz Proline 480SC 5.7 fl oz	In-Furrow, In-Furrow, Banded	29.8 bc	23.0 cd	10.5 ab	12.8	173.9
3	Proline 480SC 5.7 fl oz Quadris 13.9 fl oz	In-Furrow, In-Furrow	31.2 bc	29.5 b-d	8.5 b	13.1	179.3
4	Serenade ASO 2 qt Propulse 10 fl oz Quadris 13.9 fl oz	In-Furrow, In-Furrow, Banded	39.0 b	30.3 bc	8.9 b	12.7	172.0
5	Serenade ASO 2 qt Proline 480SC 5.7 fl oz Quadris 13.9 fl oz	In-Furrow, In-Furrow, Banded	41.4 b	35.5 bc	9.6 ab	12.6	169.4
6	Quadris 13.9 fl oz	In-Furrow	45.5 b	27.3 cd	7.2 bc	12.5	168.8
7	Propulse 10 fl oz	In-Furrow	45.9 b	41.3 b	5.7 bc	12.9	176.4
8	Non-Treated Control	N/A	77.7 a	71.8 a	1.7 c	12.6	170.9

[a] Column values followed by the same letter are not significantly different based on Fisher's Protected LSD (α=0.05); if no letter, then the effect is not significant.

[b] Disease index was calculated by multiplying the disease incidence (0-100%) by the mean symptomatic root severity (1-7) and dividing by 7.

Summary: Mean disease index values were significantly different among treatments (P<0.01), with all treatments exhibiting significantly lower levels of root infection than the non-treated control plot. The lowest disease ratings were observed in treatments 1, 2, and 3, with an index ranging between 16.1% and 31.2%. The percent of plants lost during the season was significantly different among treatments (P<0.0001); the non-treated control had significantly greater losses than other plots, with a mean loss of 71.8%. Treatments with the lowest levels of loss included 1, 2, 3, and 6, with values between 16.1% and 29.5%. Despite having overall low yield values, there were significant differences among treatments (P<0.05). Treatment 1 provided the greatest mean yield, 13.9 t/A; treatments 2 and 5 performed similarly. The lowest mean yield was obtained in non-treated plots, which did not differ from treatments 6 or 7. The range of mean yields for these treatments was 1.7-7.2 t/A. There were no differences in percent sugar or RWST values among the tested treatments (P>0.05). To prevent residual foliar fungicide effect on Rhizoctonia infection, no foliar leaf spot management was conducted; this, combined with the severe Rhizoctonia root rot, may account for the low yield parameters observed in this trial. Taking this into consideration, program 1 performed overall better than the other programs in this study.

Xanthion In-Furrow Fungicide

M & K Farms, Quanicassee - 2018

Trial Quality: Excellent
Variety: C-G333NT
Planted: April 29
Harv/Samp: Oct 19 / Oct 10
Plot Size: 6 reps
Row Spacing: 28 inch
Seeding Rate: 55,000

Soil Info: Loam
Fertilizer: 2x2: 15 gal 28%, 5 gal 10-34-0, 3 gal Thiosul + Mn&B; S.D. 40 gal 28%
Prev Crop: Corn
Weather: Dry until mid July, then good weather

Rhiz Control: Low/moderate pressure: See treatments
Cerc Control: Good control: See comments for materials.
Other Pests: N/A

Treatment	$/A	RWSA	RWST	T/A	% Sugar	% CJP	Population 100 Ft. of Row		Dead Beets 1200 Ft
							10 Day	33 Day	
Quadris	$1,720	**9820**	**249**	**39.4**	**16.8**	**95.3**	**21**	**227**	**17**
Check	$1,694	**9674**	**249**	**38.8**	**16.7**	**95.4**	**33**	**239**	94
Xanthion	$1,665	**9508**	**249**	38.2	**16.7**	**95.3**	**31**	**230**	115
LSD 5%	—	ns	ns	0.8	ns	ns	ns	ns	35
CV %	—	2	2	1.5	0.8	0.3	36	6	36

Comments: This trial was done to compare Xanthion In-Furrow Fungicide (BASF) to Quadris for control of Rhizoctonia. Xanthion is a 2 component fungicide made up of a biological fungicide and pyraclostrobin (active ingredient in Headline). Both Xanthion and Quadris were applied T-band in-furrow. Both products went through a Dosatron injection system to mix with water. Xanthion was applied at 10.8 oz./acre (1.8 oz. of part A, 9 oz. of part B) and Quadris was applied at 7.5 oz./acre. The Check treatment did not receive any in-furrow fungicide. No treatments in this trial received any foliar Quadris. In this trial, the best indicator of a fungicide's performance against Rhizoctonia is the dead beet counts. The dead beet counts were statistically better for Quadris than the Xanthion or Check treatments at the 95% confidence level. This led to an improvement in tonnage for Quadris over Xanthion. Leafspot materials were as follows: 6/26 Inspire XT + EBDC; 7/11 Super Tin + EBDC; 7/24 Topguard + EBDC; 8/13 Super Tin + EBDC; 8/23 Delaro + EBDC; 9/7 Badge SC; 9/19 Badge SC.

$/A: Gross payment unless noted as net. Calculated assuming a $40 payment, an average RWST of 238, and the early delivery premium.
Bold: Results are not statistically different from top ranking treatment in each column.

Xanthion In-Furrow Fungicide

Spartan Acres Farms, Freeland - 2018

Trial Quality: Excellent
Variety: B-149
Planted: April 30
Harv/Samp: Sept 18 / Sept 4
Plot Size: 4 reps
Row Spacing: 20 inch
Seeding Rate: 62,000

Soil Info: Loam
Fertilizer: PPI: 70#N by 28%; 2x2 30#-10#-0#-12#S-2#B
Prev Crop: Wheat / Clover
Weather: Dry until mid July, then good weather

Rhiz Control: Very low pressure: See treatments
Cerc Control: Good control: See comments for materials.
Other Pests: N/A

Treatment	$/A	RWSA	RWST	T/A	% Sugar	% CJP	Population 100 Ft. of Row		Dead Beets 1200 Ft
							13 Day	36 Day	
Quadris	$1,574	**6591**	**187**	**35.2**	**13.8**	**93.5**	**148**	**170**	**5**
Xanthion	$1,531	**6412**	**187**	**34.3**	**13.7**	**93.9**	**154**	**179**	**10**
Check	$1,511	**6330**	**187**	33.8	**13.7**	**93.6**	**139**	**169**	**8**
LSD 5%	—	ns	ns	1.1	ns	ns	ns	ns	ns
CV %	—	2	2	1.8	1.4	0.4	5.6	3.8	85

Comments: This trial was done to compare Xanthion In-Furrow Fungicide (BASF) to Quadris for control of Rhizoctonia. Xanthion is a 2 component fungicide made up of a biological fungicide and pyraclostrobin (active ingredient in Headline). Both Xanthion and Quadris were applied T-band in-furrow. Both products went through a Dosatron injection system to mix with water. Xanthion was applied at 10.8 oz./acre (1.8 oz. of part A, 9 oz. of part B) and Quadris was applied at 8 oz./acre. The Check treatment did not receive any in-furrow fungicide. No treatments in this trial received any foliar Quadris. In this trial, the best indicator of a fungicide's performance against Rhizoctonia is the dead beet counts. The disease level in this trial was very low and there is no statistical difference in dead beet counts in this trial. Even though disease levels were low, Quadris did show a tonnage improvement over the untreated check. Leafspot materials were as follows: 1. EBDC, 2. Inspire + EBDC, 3. Priaxor + EBDC, 4. Super Tin, 5. Proline + EBDC.

$/A: Gross payment unless noted as net. Calculated assuming a $40 payment, an average RWST of 238, and the early delivery premium.
Bold: Results are not statistically different from top ranking treatment in each column.

Propulse Fungicide In-Furrow

Meylan Farms, Auburn - 2018

Trial Quality: Excellent
Variety: C-G333NT
Planted: April 29
Harv/Samp: Oct 29 / Oct 17
Plot Size: 5 reps
Row Spacing: 22 inch
Seeding Rate: 68,000

Soil Info: Loam
Fertilizer: PPI: 90# N; 2x2: 38#-27#-3S + Mn, B
Prev Crop: Wheat / Clover
Weather: Dry until mid July, then good weather

Rhizoc Control: Low pressure: See treatments
Cerc Control: Good control: See comments for materials
Other Pests: Sugarbeet Cyst Nematode

Treatment	RWSA	RWST	T/A	% Sugar	% CJP	Population 100 Ft of Row		Dead Beets / 1200 Ft	Cyst Nematodes - 100 cc of Soil	
						14 Day	30 Day		Cysts	Eggs + Juv's
Check	**7899**	**263**	**30.1**	**17.5**	**96.4**	**211**	**235**	37	**10**	**472**
Quadris	**7681**	**257**	**29.9**	**17.2**	**96.1**	**207**	**235**	**8**	16	**940**
Propulse	**7670**	**257**	**29.8**	**17.3**	**95.9**	165	**222**	**21**	**3**	**440**
LSD 5%	ns	ns	ns	ns	ns	22	ns	14	10	ns
CV %	2	2	1.7	1.6	0.3	7	5	44	69	95

Comments: This trial was done to evaluate an in-furrow application of Propulse fungicide (Bayer CropScience) for effectiveness on Rhizoctonia and sugarbeet cyst nematode. Propulse fungicide is the combination of prothioconazole (active ingredient in Proline) and fluopyram. Bayer representatives believe that fluopyram may help in control of sugarbeet cyst nematode. Propulse (13.6 oz/acre) plus Fastac insecticide (4 oz/acre) was compared to Quadris (8.5 oz/acre) plus Fastac. The Check treatment did not have any in-furrow fungicide or insecticide. The Propulse and Quadris treatments were applied in a 3" T-band with 7.5 gallons of water. The entire trial received foliar Quadris (14 oz/acre) at 6-8 leaf. The foliar Quadris likely held disease pressure down across the trial, but both the Quadris and Propulse treatments were statistically better than the Check for Rhizoctonia dead beet control. Sugarbeet cyst nematode (SBCN) samples were taken in the fall in 100 foot of row in each of the replications. SBCN sampling is always variable by nature of the pest, however the Propulse treatment had a statistically lower cyst count than the Quadris treatment. The results were not statistically significant for eggs and juvenile counts. The data is somewhat confusing in that the results for eggs and juveniles are very close between the Propulse and Check treatments since the Check probably should have been closer to the Quadris results for nematode counts. Any potential nematode help from Propulse did not result in a yield or sugar improvement. The leafspot program was as follows: 6/29 Inspire + EBDC, 7/18 Super Tin + Badge, 7/31 Enable + EBDC, 8/15 Super Tin + Badge, 9/7 Delaro + Proline, 9/22 Badge.

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

Propulse Fungicide In-Furrow

LAKKE Ewald Farms, Unionville - 2018

Trial Quality:	Good	**Soil Info:**	Loam	**Rhizoc Control:**	Very low pressure: See treatments.
Variety:	SX-1245N RR	**Fertilizer:**	2x2: 14.6 gal 28%, 3 gal Thiosul, pt of B, qt of Mn; Broadcast 73#N	**Cerc Control:**	Good control: See comments for materials
Planted:	April 26				
Harv/Samp:	Oct 17 / Oct 10				
Plot Size:	4 reps	**Prev Crop:**	Wheat / Clover		
Row Spacing:	20 inch	**Weather:**	Dry until mid July, then good weather	**Other Pests:**	Pin nematode
Seeding Rate:	62,600				

Treatment	RWSA	RWST	T/A	% Sugar	% CJP	Population 100 Ft of Row		Dead Beets / 1200 Ft	Cyst Nematodes - 100 cc of Soil	
						12 Day	35 Day		Cysts	Eggs + Juv's
Quadris	**9076**	**251**	**36.2**	**16.8**	**95.6**	51	**141**	**7**	**0**	**16**
Check	**8812**	**245**	**36.0**	**16.5**	**95.2**	**105**	**144**	**23**	**1**	**15**
Propulse	**8806**	**248**	**35.6**	**16.6**	**95.5**	44	**134**	**8**	**0**	**1**
LSD 5%	ns	ns	ns	ns	ns	21	ns	ns	ns	ns
CV %	6	4	3.1	3.6	0.2	18	11	73	149	173

Comments: This trial was done to evaluate an in-furrow application of Propulse fungicide (Bayer CropScience) for effectiveness on Rhizoctonia and sugarbeet cyst nematode. Propulse fungicide is the combination of prothioconazole (active ingredient in Proline) and fluopyram. Bayer representatives believe that fluopyram may help in control of sugarbeet cyst nematode. Propulse (13.6 oz/acre) plus Mustang Max insecticide (3.5 oz/acre) was compared to Quadris (8.5 oz/acre) plus Mustang Max. The Check treatment did not have any in-furrow fungicide or insecticide. The Propulse and Quadris treatments were applied in a 3" T-band with 5.5 gallons of water. None of the trial received any foliar Quadris. Even with no foliar Quadris, disease pressure in this trial was very low with the untreated check only having an average Rhizoctonia dead beet count of 23. Both the Quadris and Propulse treatments are statistically better than the Check for dead beet counts at the 90% confidence level. Sugarbeet cyst nematode (SBCN) samples were taken in the fall in 100 foot of row in each of the replications. This field was known to have SBCN from a previous trial but sampling this fall did not show much of a SBCN population. The MSU Diagnostic Lab did find Pin nematode with average counts of 214 for Quadris, 195 for Check and 108 for Propulse. The Propulse is statistically better than both the Check and Quadris for Pin nematode at 95% confidence. Any potential nematode help from Propulse did not result in a yield or sugar improvement. The leafspot program was as follows: 6/28 Proline + EBDC, 7/25 Super Tin + Badge, 8/12 Inspire XT + Gem + Max-In Boron, 9/1 EBDC + Badge, 9/7 Proline + Badge, 9/28 Badge. All applications included Masterlock.

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

Evaluate Fungicide Application Timings (BEETcast) for Control of Cercospora and Alternaria Leafspot in Sugarbeets

Average of 2 locations - 2018

Trial Quality: Good
Varieties: HM-9879NT, B-1399, C-G515 and C-G333NT
Plots: 6 rows X 38 ft, 6 reps
Row Spacing: 22 inches

Soil and Other Info: See individual trials

Rhizoc Level: Low
Cerc. Control: See trts.
Problems: None
Seeding Rate: 4.1 inches
Beets/100 ft: ~220

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

No.	Treatment	Variety	# Applic	% Leafspot Damage Avg		Net $/A		RWSA		RWST		T/A		% SUC	
10	1st and 15th	B-1399	6	**0.3**	**i**	**$1,372**	**ab**	**8561**	**a**	237	def	**36.3**	**ab**	16.1	d-g
9	More Aggressive	B-1399	5	**1.2**	**hi**	**$1,360**	**ab**	**8449**	**a**	233	d-g	**36.7**	**ab**	15.8	e-i
7	Rec. DSV	B-1399	5	**2.2**	**f-i**	**$1,324**	**a-d**	**8184**	**ab**	233	d-g	**35.3**	**abc**	15.8	e-i
8	Less Aggressive	B-1399	4	3.7	fgh	$1,253	c-f	7757	bc	224	hi	34.6	bcd	15.3	ij
11	3 Spray	B-1399	3	5.2	f	$1,241	def	7493	c	226	ghi	33.3	d	15.4	hij
12	Untreated Check	B-1399	0	53.4	b	$1,026	ij	5905	f	203	k	29.5	efg	14.0	kl
22	1st and 15th	C-G333N	6	**2.0**	**ghi**	**$1,370**	**ab**	**8552**	**a**	239	def	**36.1**	**abc**	16.3	cde
21	More Aggressive	C-G333N	5	**2.3**	**f-i**	**$1,390**	**a**	**8600**	**a**	233	d-g	**36.9**	**a**	15.9	d-h
20	Less Aggressive	C-G333N	5	**2.6**	**f-i**	**$1,351**	**ab**	**8436**	**a**	233	d-g	**36.1**	**abc**	15.7	f-i
19	Rec. DSV	C-G333N	5	**2.7**	**f-i**	**$1,359**	**ab**	**8387**	**a**	232	e-h	**36.3**	**ab**	15.8	f-i
23	5 Spray	C-G333N	5	10.5	e	**$1,341**	**abc**	**8309**	**a**	232	e-h	**36.1**	**abc**	15.7	f-i
24	Untreated Check	C-G333N	0	69.3	a	$1,021	ij	5885	f	197	k	30.0	e	13.7	l
15	More Aggressive	C-G515	5	**1.4**	**ghi**	**$1,358**	**ab**	**8415**	**a**	238	def	**35.5**	**abc**	16.1	d-g
16	1st and 15th	C-G515	6	**2.1**	**f-i**	**$1,345**	**abc**	**8407**	**a**	237	def	**35.7**	**abc**	16.1	def
13	Rec. DSV	C-G515	5	**2.4**	**f-i**	**$1,343**	**abc**	**8310**	**a**	241	bcd	34.7	bcd	16.3	cde
14	Less Aggressive	C-G515	5	4.6	fg	$1,288	b-e	**8077**	**ab**	234	d-g	34.3	cd	15.8	e-i
17	4 Spray	C-G515	4	19.6	d	$1,220	efg	7540	c	230	fgh	32.9	d	15.6	g-j
18	Untreated Check	C-G515	0	68.7	a	$1,022	ij	5891	f	210	j	28.3	efg	14.5	kl
4	1st and 15th	HIL-9879NT	6	**0.9**	**hi**	$1,138	gh	7213	cd	**248**	**ab**	29.3	efg	**16.8**	**ab**
3	More Aggressive	HIL-9879NT	5	**0.9**	**hi**	$1,176	fg	7376	c	**250**	**a**	29.8	ef	**16.9**	**a**
1	Rec. DSV	HIL-9879NT	4	**1.8**	**ghi**	$1,180	fg	7317	cd	**249**	**ab**	29.8	ef	**16.7**	**abc**
5	2 Spray	HIL-9879NT	2	**1.8**	**ghi**	$1,135	gh	6835	de	**247**	**abc**	27.9	fg	**16.6**	**abc**
2	Less Aggressive	HIL-9879NT	3	**3.1**	**f-i**	$1,072	hi	6617	e	240	cde	27.8	g	16.3	bcd
6	Untreated Check	HIL-9879NT	0	36.7	c	$956	j	5518	f	222	i	25.2	h	15.1	j

Average	12.47	$1,235.1	7584.8	232.0	32.85	15.75
LSD 5%	2.68	84.8	492.8	7.2	1.66	0.44
CV %	15.2	4.9	4.6	2.2	3.6	2.0

Means followed by the same letter are not significantly different. Duncans New MRT 5%.

Net $/A: Assume a $40 beet payment and trial average RWST with fungicide costs subtracted off.

Evaluate Fungicide Application Timings (BEETcast) for Control of Cercospora and Alternaria Leafspot in Sugarbeets

Average of 2 locations - 2018

Application Timing Effect (averaged over varieties)

No.	Treatment	Net $/A	% Leafspot Damage	RWSA	RWST	T/A	% SUC	% CJP
3	More Aggressive	**$1,321 a**	**1.5 d**	**8210 a**	**239 a**	**34.7 a**	**16.2 ab**	**95.8 a**
4	1st and 15th	**$1,306 a**	**1.3 d**	**8183 a**	**240 a**	**34.4 ab**	**16.3 ab**	**95.8 a**
1	Rec. DSV	**$1,302 a**	**2.3 d**	**8050 a**	**239 a**	34.0 b	16.1 b	**95.9 a**
2	Less Aggressive	$1,241 b	3.5 c	7722 b	233 b	33.2 c	15.8 c	**95.7 a**
5	2 Spray	$1,234 b	9.3 b	7544 b	234 b	32.5 c	15.8 c	**95.9 a**
6	Untrreated Check	$1,006 c	57.0 a	5800 c	208 c	28.3 d	14.3 d	95.5 b
Average		$1,235.1	12.47	7584.8	232.0	32.85	15.75	95.76
LSD 5%		34.6	1.09	201.2	2.9	0.68	0.18	0.18
CV%		4.9	15.2	4.6	2.2	3.6	2.0	0.3

Variety Effect (averaged over fungicide treatments)

No.	Treatment	Net $/A	% Leafspot Damage	RWSA	RWST	T/A	% SUC	% CJP
4	C-G333N	**$1,305 a**	14.9 b	**8028 a**	228 c	**35.2 a**	15.49 c	95.7
2	B-1399	$1,263 b	11.0 c	7725 b	226 c	34.3 b	15.4 c	95.7
3	C-G515	$1,263 b	16.5 a	7774 b	232 b	33.6 c	15.72 b	95.8
1	HIL-9879NT	$1,110 c	**7.5 d**	6813 c	**243 a**	28.3 d	**16.4 a**	95.8
Average		$1,235.1	12.47	7584.8	232.0	32.85	15.75	95.76
LSD 5%		16.5	1.10	88.8	2.1	0.36	0.14	0.18
CV%		2.5	16.5	2.2	1.7	2.1	1.7	0.3

Means followed by the same letter are not significantly different. Duncans New MRT 5%.

Comments: Fungicide application timing treatments were evaluated for control of Cercospora (*Cercospora beticola*) and Alternaria (*Alternaria alternata*) leafspot at 2 locations (Elkton and Richville, MI) in 2018. Four varieties were utilized: HIL-9879NT (very tolerant), B-1399 (tolerant), C-G515 (fairly tolerant to Cercospora, susceptible to Alternaria) and C-G333N (susceptible to Cercospora, mid-level tolerance to Alternaria). Fungicide application timing treatments were: Aggressive, Recommended, Less Aggressive, 1st and 15th and 2, 3, 4 or 5 applications depending upon varietal tolerance. When averaged over both locations, HIL-9879NT clearly provided the best control of leafspot followed by B-1399, C-G333NT and C-G515 which was badly infected with Alternaria leafspot. With respect to application timing, the 1st and 15th and More aggressive treatments provided very good leafspot control. The Recommended Treatment also gave good leafspot control, followed by the Less Aggressive and 2, 3, 4 or 5 treatments. The leafspot pressure was very high. Untreated Check plots lost about 6 tons/acre and 2 points of sugar due to the leafspot infection.

Net $/A: Assume a $40 beet payment and trial average RWST with fungicide costs subtracted off.
Bold: Results are not statistically different from top-ranking treatment in each column.

Evaluate Fungicide Application Timings (BEETcast) for Control of Cercospora and Alternaria Leafspot in Sugarbeets

Auernhamer, Richville, MI - 2018

Trial Quality: Good
Varieties: HIL-9879NT,B-1399 C-G515,C-G333N
Planted: April 30
Harvested: Sept 28
Plots: 6 rows X 38 ft, 4 reps
Row Spacing: 22 inches

Soil Info: Sandy Clay Loam
% OM: 3.4 **pH**: 7.6 **CEC:** 17.1
P: above opt **K:** above opt
Mn: high **B:** med
Added N: 135 lbs.
Previous Crop: Corn

Rhizoc Level: Low
Cerc. Control: See trts.
Problems: None
Seeding Rate: 4.1 inches
Rainfall: 21.3 inches
Beets/100 ft: ~262

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

No.	Treatment	Variety	# Applic	% Leafspot Damage 24-Sep	% Leafspot Damage 5-Sep	Net $/A	RWSA	RWST	T/A	% SUC
10	1st and 15th	B-1399	6	**0.4 f**	**0.1 e**	**$1,633 abc**	**9739 ab**	**228 a-e**	**42.8 ab**	15.4 b-g
9	More Aggressive	B-1399	5	**0.6 f**	**0.2 e**	$1,575 bc	9368 bc	218 ef	**42.9 ab**	14.9 fg
7	Rec. DSV	B-1399	5	**3.0 ef**	**0.9 e**	**$1,632 abc**	**9648 ab**	226 b-f	**42.7 ab**	15.3 b-g
11	3 spray	B-1399	3	**5.3 ef**	**1.9 e**	$1,498 cde	8687 cde	221 def	39.2 de	15.2 d-g
8	Less Aggressive	B-1399	4	**5.3 ef**	**1.9 e**	$1,530 bcd	9105 bcd	216 f	**41.7 abc**	14.8 g
12	Untreated Check	B-1399	0	79.1 b	44.0 b	$1,293 fg	7218 hi	193 hi	37.4 efg	13.4 ij
21	More Aggressive	C-G333N	5	**1.2 f**	**0.3 e**	**$1,714 a**	**10143 a**	**234 ab**	**43.2 a**	**15.9 ab**
23	5 spray	C-G333N	5	**3.0 ef**	**0.9 e**	**$1,646 ab**	**9757 ab**	226 b-f	**43.2 a**	15.3 b-g
19	Rec. DSV	C-G333N	5	**3.0 ef**	**0.9 e**	**$1,654 ab**	**9771 ab**	225 b-f	**43.5 a**	15.2 c-g
22	1st and 15th	C-G333N	6	**3.6 ef**	**1.2 e**	**$1,618 abc**	**9655 ab**	226 b-f	**42.6 ab**	**15.5 a-f**
20	Less Aggressive	C-G333N	5	**5.3 ef**	**1.9 e**	**$1,610 abc**	**9658 ab**	**229 a-e**	**41.8 abc**	**15.4 a-g**
24	Untreated Check	C-G333N	0	100.0 a	65.6 a	$1,234 gh	6893 ij	191 i	36.0 fgh	13.3 j
15	More Aggressive	C-G515	5	**1.2 f**	**0.4 e**	**$1,654 ab**	**9808 ab**	**234 ab**	**42.0 abc**	**15.9 a-d**
16	1st and 15th	C-G515	6	**3.0 ef**	**0.9 e**	**$1,589 abc**	**9493 ab**	226 b-f	**42.1 abc**	15.4 b-g
13	Rec. DSV	C-G515	5	**4.4 ef**	**1.7 e**	**$1,584 abc**	**9381 abc**	**231 a-d**	40.5 bcd	**15.7 a-e**
14	Less Aggressive	C-G515	5	8.8 e	**4.2 e**	$1,561 bc	**9414 ab**	**234 ab**	39.7 cde	**15.8 a-e**
17	4 Spray	C-G515	4	22.3 d	10.0 d	$1,426 def	8439 def	222 c-f	38.0 ef	15.1 efg
18	Untreated Check	C-G515	0	100.0 a	62.5 a	$1,231 gh	6875 ij	201 gh	34.1 hi	14.0 hi
3	More Aggressive	HIL-9879NT	5	**2.2 ef**	**0.7 e**	$1,398 ef	8377 ef	**238 a**	35.2 gh	**16.1 a**
4	1st and 15th	HIL-9879NT	6	**2.4 ef**	**0.7 e**	$1,341 fg	8110 efg	**236 ab**	34.4 hi	**16.0 ab**
5	2 spray	HIL-9879NT	2	**3.7 ef**	**1.4 e**	$1,322 fg	7653 gh	**234 ab**	32.7 i	**15.9 abc**
1	Rec. DSV	HIL-9879NT	4	**4.8 ef**	**1.9 e**	$1,363 fg	8092 efg	**233 abc**	34.7 hi	**15.8 a-e**
2	Less Aggressive	HIL-9879NT	3	**5.9 ef**	**3.1 e**	$1,318 fg	7787 fgh	**231 a-d**	33.7 hi	**15.7 a-e**
6	Untreated Check	HIL-9879NT	0	70.6 c	28.3 c	$1,118 h	6244 j	207 g	30.2 j	14.1 h
	Average			18.28	9.81	$1,480.9	8721.5	223.4	38.93	15.21
	LSD 5%			5.78	4.75	116.9	644.8	9.5	2.18	0.58
	CV %			22.4	34.3	5.6	5.2	3.0	4.0	2.7

Means followed by the same letter are not significantly different. Duncans New MRT 5%.

Net $/A: Assume a $40 beet payment and trial average RWST with fungicide costs subtracted off.

Application Timing Effect (averaged over varieties)

No.	Treatment	Net $/A	% Leafspot Damage		RWSA	RWST	T/A	% SUC
			24-Sep	5-Sep				
3	More Aggressive	**$1,586 a**	**1.3 d**	**0.4 d**	**9424 a**	**231 a**	**40.8 a**	**15.7 a**
1	Rec. DSV	**$1,558 ab**	**3.8 cd**	**1.3 bcd**	**9223 ab**	**229 ab**	**40.3 a**	**15.5 ab**
4	1st and 15th	**$1,545 ab**	**2.3 d**	**0.7 cd**	**9249 ab**	**229 ab**	**40.5 a**	**15.6 ab**
2	Less Aggressive	**$1,505 bc**	6.3 bc	2.8 bc	8991 b	**227 ab**	39.2 b	15.4 b
5	2 Spray	$1,473 c	8.5 b	3.5 b	8634 c	226 b	38.3 b	15.4 b
6	Untreated Check	$1,219 d	87.4 a	50.1 a	6808 d	198 c	34.4 c	13.7 c
	Average	$1,480.9	18.28	9.81	8721.5	223.4	38.93	15.21
	LSD 5%	58.46	2.89	2.38	322.4	4.7	1.09	0.29
	CV%	5.6	22.4	34.2	5.2	3.0	4.0	2.7

Variety Effect (averaged over fungicide treatments)

No.	Treatment	Net $/A	% Leafspot Damage		RWSA	RWST	T/A	% SUC
			24-Sep	5-Sep				
4	C-G333N	**$1,579 a**	19.3 b	11.8 a	**9313 a**	222 b	**41.7 a**	15.1 b
2	B-1399	$1,527 b	**15.6 c**	**8.2 b**	8961 b	217 c	41.1 b	14.8 c
3	C-G515	$1,508 b	23.3 a	13.3 a	8902 b	225 b	39.4 c	15.3 b
1	HIL-9879NT	$1,310 c	**14.9 c**	**6.0 b**	7711 c	**230 a**	33.5 d	**15.6 a**
	Average	$1,480.9	18.28	9.81	8721.5	223.4	38.93	15.21
	LSD 5%	36.6	3.29	2.52	204.8	3.6	0.42	0.25
	CV%	3.8	27.5	39.3	3.6	2.5	1.6	2.5

Means followed by the same letter are not significantly different. Duncans New MRT 5%.

Comments: Fungicide application timing treatments were evaluated for control of Cercospora (*Cercospora beticola*) and Alternaria (*Alternaria alternata*) leafspot near Richville, MI in 2018. Four varieties were utilized: HIL-9879NT (very tolerant), B-1399 (tolerant), C-G515 (fairly tolerant to Cercospora, susceptible to Alternaria) and C-G333N (susceptible to Cercospora, mid-level tolerance to Alternaria). Fungicide application timing treatments were: Aggressive Recommended, Less Aggressive, 1st and 15th and 2, 3, 4 or 5 applications depending upon varietal tolerance. HIL-9879NT clearly provided the best control of leafspot followed by B-1399, C-G515 and C-G333NT. With respect to application, the 1st and 15th treatment gave the best leafspot control followed by Recommended, More Aggressive and the 2, 3, 4 or 5 treatments. The leafspot pressure was very high. Untreated Check plots lost over 5 tons/acre and 2 points of sugar due to leafspot infection.

Net $/A: Assume a $40 beet payment and trial average RWST with fungicide costs subtracted off.
Bold: Results are not statistically different from top-ranking treatment in each column.

Evaluate Fungicide Application Timings (BEETcast) for Control of Cercospora and Alternaria Leafspot in Sugarbeets

Auernhamer, Richville, MI - 2018

No.	Program	Treatment	App	DSV	Date
1	Rec DSV.	Inspire + Manzate + Masterlock	1	52	2-Jul
	HIL-9879NT	Super Tin + Manzate + MasterLock	2	112	6-Aug
		Proline + Preference + Manzate + MasterLock	3	154	24-Aug
		Manzate + MasterLock	4	197	12-Sep
2	Less Aggressive	Inspire + Manzate + Masterlock	1	60	9-Jul
	HIL-9879NT	Super Tin + Manzate + MasterLock	2	123	10-Aug
		Proline + Preference + Manzate + MasterLock	3	188	6-Sep
3	More Aggressive	Inspire + Manzate + Masterlock	1	52	2-Jul
	HIL-9879NT	Super Tin + Manzate + MasterLock	2	74	20-Jul
		Proline + Preference + Manzate + MasterLock	3	112	6-Aug
		Super Tin + Manzate + MasterLock	4	154	24-Aug
		Manzate + MasterLock	5	188	6-Sep
4	1st and 15th	Proline + Manzate + MasterLock	1	54	3-Jul
	HIL-9879NT	Super Tin + Manzate + MasterLock	2	70	16-Jul
		Manzate + MasterLock	3	100	1-Aug
		Inspire + Manzate + Masterlock	4	133	15-Aug
		Super Tin + Manzate + MasterLock	5	172	31-Aug
		Manzate + MasterLock	6	197	12-Sep
5	2 Spray	Proline + Manzate + MasterLock	1	70	16-Jul
	HIL-9879NT	Super Tin + Manzate + MasterLock	2	133	15-Aug
6	UTC - HIL-9879NT				
7	Rec DSV.	Inspire + Manzate + MasterLock	1	52	2-Jul
	B-1399	Super Tin + Manzate + MasterLock	2	94	27-Jul
		Proline + Preference + Manzate + MasterLock	3	131	14-Aug
		Manzate + MasterLock	4	172	31-Aug
		Manzate + MasterLock	5	189	7-Sep
8	Less Aggressive	Inspire + Manzate + MasterLock	1	54	3-Jul
	B-1399	Super Tin + Manzate + MasterLock	2	112	6-Aug
		Proline + Preference + Manzate + MasterLock	3	154	24-Aug
		Manzate + MasterLock	4	197	12-Sep
9	More Aggressive	Inspire + Manzate + MasterLock	1	52	2-Jul
	B-1399	Super Tin + Manzate + MasterLock	2	74	20-Jul
		Proline + Preference + Manzate + MasterLock	3	112	6-Aug
		Super Tin + Manzate + MasterLock	4	154	24-Aug
		Manzate + MasterLock	5	188	6-Sep
10	1st and 15th	Proline + Manzate + MasterLock	1	52	2-Jul
	B-1399	Super Tin + Manzate + MasterLock	2	70	16-Jul
		Manzate + MasterLock	3	100	1-Aug
		Inspire + Manzate + MasterLock	4	133	15-Aug
		Super Tin + Manzate + MasterLock	5	172	31-Aug
		Manzate + MasterLock	6	197	12-Sep

Evaluate Fungicide Application Timings (BEETcast) for Control of Cercospora and Alternaria Leafspot in Sugarbeets

Auernhamer, Richville, MI - 2018

No.	Program	Treatment	App	DSV	Date
11	3 Spray	Proline + Manzate + MasterLock	1	60	9-Jul
	B-1399	Super Tin + Manzate + MasterLock	2	123	9-Aug
		Manzate + MasterLock	3	195	11-Sep
12	UTC - B-1399				
13	Rec. DSV	Inspire + Manzate + MasterLock	1	49	29-Jun
	C-G515	Super Tin + Manzate + MasterLock	2	91	25-Jul
		Proline + Preference + Manzate + MasterLock	3	121	9-Aug
		Manzate + MasterLock	4	153	23-Aug
		Manzate + MasterLock	5	195	11-Sep
14	Less Aggressive	Inspire + Manzate + MasterLock	1	49	29-Jun
	C-G515	Super Tin + Manzate + MasterLock	2	70	16-Jul
		Proline + Preference + Manzate + MasterLock	3	97	30-Jul
		Super Tin + Manzate + MasterLock	4	133	15-Aug
		Manzate + MasterLock	5	170	31-Aug
15	More Aggressive	Inspire + Manzate + MasterLock	1	41	25-Jun
	C-G515	Super Tin + Manzate + MasterLock	2	62	11-Jul
		Proline + Preference + Manzate + MasterLock	3	91	25-Jul
		Super Tin + Manzate + MasterLock	4	123	9-Aug
		Manzate + MasterLock	5	153	23-Aug
16	1st and 15th	Proline + Manzate + MasterLock	1	52	2-Jul
	C-G515	Super Tin + Manzate + MasterLock	2	70	16-Jul
		Manzate + MasterLock	3	100	1-Aug
		Inspire + Manzate + MasterLock	4	133	15-Aug
		Super Tin + Manzate + MasterLock	5	170	31-Aug
		Manzate + MasterLock	6	197	12-Sep
17	4 Spray	Proline + Manzate + MasterLock	1	58	5-Jul
	C-G515	Super Tin + Manzate + MasterLock	2	91	25-Jul
		Manzate + MasterLock	3	148	20-Aug
		Inspire + Manzate + MasterLock	4	183	4-Sep
18	UTC - C-G515				
19	Rec. DSV	Inspire + Manzate + MasterLock	1	41	21-Jun
	C-G333N	Super Tin + Manzate + MasterLock	2	85	20-Jul
		Proline + Preference + Manzate + MasterLock	3	116	3-Aug
		Manzate + MasterLock	4	148	20-Aug
		Manzate + MasterLock	5	183	6-Sep
20	Less Aggressive	Inspire + Manzate + MasterLock	1	49	29-Jun
	C-G333N	Super Tin + Manzate + MasterLock	2	70	16-Jul
		Proline + Preference + Manzate + MasterLock	3	97	30-Jul
		Super Tin + Manzate + MasterLock	4	133	15-Aug
		Manzate + MasterLock	5	170	31-Aug

Evaluate Fungicide Application Timings (BEETcast) for Control of Cercospora and Alternaria Leafspot in Sugarbeets

Auernhamer, Richville, MI - 2018

No.	Program	Treatment	App	DSV	Date
21	More Aggressive	Inspire + Manzate + MasterLock	1	41	25-Jun
	C-G333N	Super Tin + Manzate + MasterLock	2	62	11-Jul
		Proline + Preference + Manzate + MasterLock	3	91	25-Jul
		Super Tin + Manzate + MasterLock	4	123	9-Aug
		Manzate + MasterLock	5	165	23-Aug
22	1st and 15th	Proline + Manzate + MasterLock	1	52	2-Jul
	C-G333N	Super Tin + Manzate + MasterLock	2	70	16-Jul
		Manzate + MasterLock	3	100	1-Aug
		Inspire + Manzate + MasterLock	4	133	15-Aug
		Super Tin + Manzate + MasterLock	5	170	31-Aug
		Manzate + MasterLock	6	197	12-Sep
23	5 Spray	Proline + Manzate + MasterLock	1	52	2-Jul
	C-G333N	Super Tin + Manzate + MasterLock	2	74	20-Jul
		Manzate + MasterLock	3	108	6-Aug
		Inspire + Manzate + MasterLock	4	143	16-Aug
		Super Tin + Manzate + MasterLock	5	186	6-Sep
24	UTC - C-G333N				

Evaluate Fungicide Application Timings (BEETcast) for Control of Cercospora and Alternaria Leafspot in Sugarbeets

Laker Agronomy Field, Elkton, MI - 2018

Trial Quality: Fair-Good
Varieties: HIL-9879NT,B-1399 C-G515,C-G333NT
Planted: May 2
Harvested: Oct 22
Plots: 6 rows X 38 ft, 6 reps
Row Spacing: 22 inches

Soil Info: Clay Loam
% OM: 2.6 **pH**: 7.4 **CEC:** 15.1
P: above opt **K:** above opt
Mn: high **B:** med
Added N: 135 lbs
Previous Crop: Soybeans

Rhizoc Level: Low
Cerc. Control: See trts.
Problems: None
Seeding Rate: 4.1 inches
Rainfall: 22.3 inches
Beets/100 ft: ~177

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

No.	Treatment	Variety	# Applic	% Leafspot Damage 18-Sep	% Leafspot Damage 28-Aug	Net $/A	RWSA	RWST	T/A	% SUC
10	1st and 15th	B-1399	6	**0.1 e**	**0.5 c**	**$1,125 a-d**	**7465 a-d**	248 d-h	**30.1 ab**	16.8 cd
9	More Aggressive	B-1399	5	**1.8 e**	**1.3 c**	**$1,131 a-d**	**7448 a-d**	247 d-h	**30.1 ab**	16.6 c-f
7	Rec. DSV	B-1399	5	**3.4 e**	**1.2 c**	**$1,076 a-e**	7076 b-e	241 f-i	**29.3 ab**	16.3 d-g
8	Less Aggressive	B-1399	4	**7.4 de**	**2.9 c**	$1,016 c-f	6652 def	236 hij	28.1 bcd	16.1 fgh
11	3 Spray	B-1399	3	13.9 d	**3.6 c**	$1,026 b-f	6549 ef	228 jk	**28.7 abc**	15.6 hi
12	Untreated Check	B-1399	0	80.0 b	12.9 b	$829 i	5006 g	211 lm	23.9 e	14.5 j
22	1st and 15th	C-G333N	6	**1.6 e**	**1.0 c**	**$1,214 a**	**8002 a**	252 c-f	31.7 a	17.0 c
20	Less Aggressive	C-G333N	5	**2.3 e**	**0.2 c**	**$1,159 abc**	**7613 abc**	244 e-i	**31.0 ab**	16.4 d-g
19	Rec. DSV	C-G333N	5	**5.7 e**	**0.3 c**	**$1,094 a-e**	**7186 a-e**	239 g-j	**30.0 ab**	16.2 d-g
21	More Aggressive	C-G333N	5	**7.0 de**	**0.9 c**	$1,069 b-e	7071 b-e	233 ij	**30.4 ab**	15.8 gh
23	5 Spray	C-G333N	5	41.7 c	**0.5 c**	$1,068 b-e	7057 b-e	234 ij	**30.2 ab**	15.9 gh
24	Untreated Check	C-G333N	0	95.0 a	19.4 a	$852 hi	5144 g	201 m	25.6 de	14.0 k
13	Rec. DSV	C-G515	5	**3.2 e**	**0.5 c**	**$1,102 a-e**	**7238 a-e**	248 d-h	**29.2 ab**	16.7 cde
15	More Aggressive	C-G515	5	**3.5 e**	**1.0 c**	**$1,093 a-e**	**7215 a-e**	243 e-i	**29.7 ab**	16.4 d-g
16	1st and 15th	C-G515	6	**3.9 e**	**0.8 c**	**$1,161 ab**	**7681 ab**	249 d-g	**30.9 ab**	16.8 cde
14	Less Aggressive	C-G515	5	**4.5 e**	**0.6 c**	$1,069 b-e	7074 b-e	238 g-j	**29.7 ab**	16.1 e-h
17	4 Spray	C-G515	4	41.7 c	**2.5 c**	$1,034 b-f	6760 c-f	237 g-j	**28.5 abc**	16.0 fgh
18	Untreated Check	C-G515	0	95.0 a	17.3 a	$878 ghi	5302 g	219 kl	24.1 e	15.1 ij
4	1st and 15th	HIL-9879NT	6	**0.1 e**	**0.3 c**	$1,025 b-f	6861 b-f	**263 abc**	26.0 cde	**17.7 ab**
1	Rec. DSV	HIL-9879NT	4	**0.2 e**	**0.2 c**	$1,032 b-f	6752 c-f	**268 a**	25.2 e	**17.9 a**
3	More Aggressive	HIL-9879NT	5	**0.4 e**	**0.3 c**	$972 e-h	6487 ef	**265 ab**	24.5 e	**17.7 ab**
2	Less Aggressive	HIL-9879NT	3	**1.7 e**	**0.8 c**	$925 f-i	6044 f	254 b-e	23.7 e	17.2 bc
5	2 Spray	HIL-9879NT	2	**1.8 e**	**0.5 c**	$1,007 d-g	6371 ef	**257 a-d**	24.8 e	17.2 bc
6	Untreated Check	HIL-9879NT	0	47.1 c	**3.5 c**	$841 hi	5077 g	241 f-i	21.0 f	16.3 d-g

Average	19.29	3.04	$1,033.3	6713.8	241.6	27.77	16.34
LSD 5%	6.71	3.25	118.8	717.2	10.5	2.63	0.54
CV %	30.4	93.5	10.0	9.3	3.8	8.3	2.9

Means followed by the same letter are not significantly different. Duncans New MRT 5%.

Net $/A: Assume a $40 beet payment and trial average RWST with fungicide costs subtracted off.

Application Timing Effect (averaged over varieties)

No.	Treatment	Net $/A	% Leafspot Damage 18-Sep	% Leafspot Damage 28-Aug	RWSA	RWST	T/A	% SUC
4	1st and 15th	**$1,131 a**	**1.5 c**	**0.7 b**	**7502 a**	**253 a**	**29.7 a**	**17.1 a**
1	Rec. DSV	**$1,076 ab**	**3.1 c**	**0.6 b**	7063 b	**249 ab**	**28.4 ab**	16.8 b
3	More Aggressive	$1,066 b	**3.2 c**	**0.9 b**	7055 b	247 bc	**28.7 ab**	16.6 bc
2	Less Aggressive	$1,042 b	**4.0 c**	**1.1 b**	6846 bc	243 cd	28.1 b	16.4 cd
5	2 Spray	$1,034 b	24.8 b	**1.8 b**	6684 c	239 d	28.1 b	16.2 d
6	Untreated Check	$850 c	79.3 a	13.3 a	5132 d	218 e	23.6 c	15.0 e
Average		$1,033.3	19.29	3.04	6713.8	241.6	27.77	16.34
LSD 5%		59.4	3.36	1.63	358.6	5.2	1.32	0.27
CV%		10.0	30.4	93.5	9.3	3.8	8.3	2.9

Variety Effect (averaged over fungicide treatments)

No.	Treatment	Net $/A	% Leafspot Damage 18-Sep	% Leafspot Damage 28-Aug	RWSA	RWST	T/A	% SUC
4	C-G333N	**$1,076 a**	25.5 a	3.7 a	**7012 a**	234 c	**29.8 a**	15.9 c
3	C-G515	**$1,056 ab**	25.3 a	3.8 a	**6878 ab**	239 b	28.7 b	16.2 b
2	B-1399	$1,034 b	17.8 b	3.7 a	6699 b	235 bc	28.4 b	16.0 bc
1	HIL-9879NT	$967 c	**8.6 c**	**0.9 b**	6265 c	**258 a**	24.2 c	**17.3 a**
Average		$1,033.3	19.29	3.04	6713.8	241.6	27.77	16.34
LSD 5%		31.2	3.29	1.38	188.2	4.3	0.64	0.22
CV%		6.0	33.9	90.5	5.6	3.5	4.6	2.6

Means followed by the same letter are not significantly different. Duncans New MRT 5%.

Comments: Fungicide application timing treatments were evaluated for control of Cercospora (*Cercospora beticola*) and Alternaria (*Alternaria alternata*) leafspot near Elkton, MI in 2018. Four varieties were utilized: HIL-9879NT (very tolerant), B-1399 (tolerant), C-G515 (fairly tolerant to Cercospora, susceptible to Alternaria) and C-G333N (susceptible to Cercospora, mid-level tolerance to Alternaria). Fungicide application timing treatments were: Aggressive, Recommended, Less Aggressive, 1st and 15th and 2, 3, 4 or 5 applications depending upon varietal tolerance. HIL-9879NT clearly provided the best control of leafspot followed by B-1399, C-G515 and C-G333N. With respect to application timing, the 1st and 15th treatment gave the best leafspot control followed by Recommended, More Aggressive, Less Aggressive and the 2, 3, 4 or 5 treatments. The leafspot pressure was very high. Untreated Check plots lost over 5 tons/acre and 2 points of sugar due to the leafspot infection.

Net $/A: Assume a $40 beet payment and trial average RWST with fungicide costs subtracted off.
Bold: Results are not statistically different from top-ranking treatment in each column.

Evaluate Fungicide Application Timings (BEETcast) for Control of Cercospora and Alternaria Leafspot in Sugarbeets

Laker Agronomy Field, Elkton, MI - 2018

No.	Program	Treatment	App	DSV	Date
1	Rec. DSV	Inspire + Manzate + MasterLock	1	63	10-Jul
	HIL-9879NT	Super Tin + Manzate + MasterLock	2	123	7-Aug
		Proline + Preference + Manzate + MasterLock	3	172	28-Aug
		Manzate + MasterLock	4	207	12-Sep
2	Less Aggressive	Inspire + Manzate + MasterLock	1	73	16-Jul
	HIL-9879NT	Super Tin + Manzate + MasterLock	2	135	13-Aug
		Proline + Preference + Manzate + MasterLock	3	197	5-Sep
3	More Aggressive	Inspire + Manzate + MasterLock	1	61	5-Jul
	HIL-9879NT	Super Tin + Manzate + MasterLock	2	87	23-Jul
		Proline + Preference + Manzate + MasterLock	3	123	7-Aug
		Super Tin + Manzate + MasterLock	4	172	28-Aug
		Manzate + MasterLock	5	205	11-Sep
4	1st and 15th	Proline + Manzate + MasterLock	1	56	2-Jul
	HIL-9879NT	Super Tin + Manzate + MasterLock	2	73	16-Jul
		Manzate + MasterLock	3	106	1-Aug
		Inspire + Manzate + MasterLock	4	139	15-Aug
		Super Tin + Manzate + MasterLock	5	180	30-Aug
		Manzate + MasterLock	6	207	12-Sep
5	2 Spray	Proline + Manzate + MasterLock	1	73	16-Jul
	HIL-9879NT	Super Tin + Manzate + MasterLock	2	139	15-Aug
6	UTC - HIL-9879NT				
7	Rec. DSV	Inspire + Manzate + MasterLock	1	61	5-Jul
	B-1399	Super Tin + Manzate + MasterLock	2	101	30-Jul
		Proline + Preference + Manzate + MasterLock	3	147	18-Aug
		Manzate + MasterLock	4	194	4-Sep
		Manzate + MasterLock	5	218	17-Sep
8	Less Aggressive	Inspire + Manzate + MasterLock	1	63	10-Jul
	B-1399	Super Tin + Manzate + MasterLock	2	123	7-Aug
		Proline + Preference + Manzate + MasterLock	3	172	28-Aug
		Manzate + MasterLock	4	207	12-Sep
9	More Aggressive	Inspire + Manzate + MasterLock	1	61	5-Jul
	B-1399	Super Tin + Manzate + MasterLock	2	87	23-Jul
		Proline + Preference + Manzate + MasterLock	3	123	7-Aug
		Super Tin + Manzate + MasterLock	4	172	28-Aug
		Manzate + MasterLock	5	205	11-Sep
10	1st and 15th	Proline + Manzate + MasterLock	1	56	2-Jul
	B-1399	Super Tin + Manzate + MasterLock	2	73	16-Jul
		Manzate + MasterLock	3	106	1-Aug
		Inspire + Manzate + MasterLock	4	139	15-Aug
		Super Tin + Manzate + MasterLock	5	180	30-Aug
		Manzate + MasterLock	6	205	11-Sep

Evaluate Fungicide Application Timings (BEETcast) for Control of Cercospora and Alternaria Leafspot in Sugarbeets

Laker Agronomy Field, Elkton, MI - 2018

No.	Program	Treatment	App	DSV	Date
11	3 Spray	Proline + Manzate + MasterLock	1	63	10-Jul
	B-1399	Super Tin + Manzate + MasterLock	2	131	10-Aug
		Manzate + MasterLock	3	205	11-Sep
12	UTC - B-1399				
13	Rec. DSV	Inspire + Manzate + MasterLock	1	52	29-Jun
	C-G515	Super Tin + Manzate + MasterLock	2	93	25-Jul
		Proline + Preference + Manzate + MasterLock	3	128	9-Aug
		Manzate + MasterLock	4	160	23-Aug
		Manzate + MasterLock	5	205	11-Sep
14	Less Aggressive	Inspire + Manzate + MasterLock	1	52	29-Jun
	C-G515	Super Tin + Manzate + MasterLock	2	73	16-Jul
		Proline + Preference + Manzate + MasterLock	3	101	30-Jul
		Super Tin + Manzate + MasterLock	4	139	15-Aug
		Manzate + MasterLock	5	180	30-Aug
15	More Aggressive	Inspire + Manzate + MasterLock	1	44	25-Jun
	C-G515	Super Tin + Manzate + MasterLock	2	65	12-Jul
		Proline + Preference + Manzate + MasterLock	3	93	25-Jul
		Super Tin + Manzate + MasterLock	4	131	10-Aug
		Manzate + MasterLock	5	172	28-Aug
16	1st and 15th	Proline + Manzate + MasterLock	1	56	2-Jul
	C-G515	Super Tin + Manzate + MasterLock	2	73	16-Jul
		Manzate + MasterLock	3	106	1-Aug
		Inspire + Manzate + MasterLock	4	139	15-Aug
		Super Tin + Manzate + MasterLock	5	180	30-Aug
		Manzate + MasterLock	6	207	12-Sep
17	4 Spray	Proline + Manzate + MasterLock	1	61	5-Jul
	C-G515	Super Tin + Manzate + MasterLock	2	93	25-Jul
		Manzate + MasterLock	3	153	20-Aug
		Inspire + Manzate + MasterLock	4	194	4-Sep
18	UTC - C-G515				
19	Rec. DSV	Inspire + Manzate + MasterLock	1	44	25-Jun
	C-G333N	Super Tin + Manzate + MasterLock	2	87	23-Jul
		Proline + Preference + Manzate + MasterLock	3	123	7-Aug
		Manzate + MasterLock	4	153	20-Aug
		Manzate + MasterLock	5	194	4-Sep
20	Less Aggressive	Inspire + Manzate + MasterLock	1	52	29-Jun
	C-G333N	Super Tin + Manzate + MasterLock	2	73	16-Jul
		Proline + Preference + Manzate + MasterLock	3	101	30-Jul
		Super Tin + Manzate + MasterLock	4	139	15-Aug
		Manzate + MasterLock	5	180	30-Aug

Evaluate Fungicide Application Timings (BEETcast) for Control of Cercospora and Alternaria Leafspot in Sugarbeets

Laker Agronomy Field, Elkton, MI - 2018

No.	Trt	Treatment	App	DSV	Date
21	More Aggressive	Inspire + Manzate + MasterLock	1	44	25-Jun
	C-G333N	Super Tin + Manzate + MasterLock	2	65	12-Jul
		Proline + Preference + Manzate + MasterLock	3	93	25-Jul
		Super Tin + Manzate + MasterLock	4	131	10-Aug
		Manzate + MasterLock	5	172	28-Aug
22	1st and 15th	Proline + Manzate + MasterLock	1	56	2-Jul
	C-G333N	Super Tin + Manzate + MasterLock	2	73	16-Jul
		Manzate + MasterLock	3	106	1-Aug
		Inspire + Manzate + MasterLock	4	139	15-Aug
		Super Tin + Manzate + MasterLock	5	180	30-Aug
		Manzate + MasterLock	6	207	12-Sep
23	5 Spray	Proline + Manzate + MasterLock	1	56	2-Jul
	C-G333N	Super Tin + Manzate + MasterLock	2	77	20-Jul
		Manzate + MasterLock	3	114	4-Aug
		Inspire + Manzate + MasterLock	4	147	18-Aug
		Super Tin + Manzate + MasterLock	5	197	5-Sep
24	UTC - C-G333N				

Control of *Alternaria alternata* and *Cercospora beticola* Leafspot with Registered and Experimental Fungicides
Answer Plot, Bach, MI - 2018

Trial Quality: Good
Variety: C-RR059
Planted: May 8
Harvested: Oct. 9
Plots: 6 rows x 35 ft, 4 reps
Row Spacing: 22 inches

Soil Info: Loam
%OM: 2.0 **pH:** 7.6 **CEC:** 12.9
P: above opt **K:** above opt
Mn: high **B:** high
Added N: 135 Lbs
Prev Crop: Corn

Rhizoc Level: Low
LS Control: See trts.
Problems: None
Seeding Rate: 4.1 inches
Rainfall: 15.4 inches
Beets/100 ft: ~215

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

No.	Treatment	Rate /A	% Leaf Damage 9-Oct	Net $/A	RWSA	RWST	T/A	% SUC
5	Super Tin + Topsin + Manzate + Masterlock (7/2, 7/28)	8 fl oz + 10 fl oz + 1.6 qt + 6.4 fl oz	**2.6 h**	**$1,330 a**	**8911 a**	**252 ab**	**35.3 a**	**16.9 a**
	Manzate + Masterlock (7/17, 8/9, 8/30)	1.6 qt + 6.4 fl oz						
	Manzate + Badge + Masterlock (8/23)	1.6 qt + 2 pt + 6.4 fl oz.						
6	Super Tin + Topsin + Manzate + Masterlock (7/2, 7/28)	8 fl oz + 20 fl oz + 1.6 qt + 6.4 fl oz	**2.9 gh**	**$1,303 ab**	**8800 ab**	**261 a**	**33.7 ab**	**17.5 a**
	Manzate + Masterlock (7/17, 8/9, 8/30)	1.6 qt + 6.4 fl oz						
	Manzate + Badge + Masterlock (8/23)	1.6 qt + 2 pt + 6.4 fl oz						
4	Super Tin + Manzate + Masterlock (7/2, 7/28)	8 fl oz + 1.6 qt + 6.4 fl oz	**5.9 fgh**	**$1,284 abc**	**8564 abc**	**248 ab**	**34.6 ab**	**17.1 a**
	Manzate + Masterlock (7/17, 8/9, 8/30)	1.6 qt + 6.4 fl oz						
	Manzate + Badge + Masterlock (8/23)	1.6 qt + 2 pt + 6.4 fl oz						
8	Minerva Duo + Masterlock (7/2, 7/28)	13.6 fl oz + 6.4 fl oz	9.3 efg	**$1,239 abc**	**8342 abc**	**258 ab**	32.3 b	**17.4 a**
	Manzate + Masterlock (7/17, 8/9, 8/30)	1.6 qt + 6.4 fl oz						
	Manzate + Badge + Masterlock (8/24)	1.6 qt + 2 pt + 6.4 fl oz.						

Means followed by the same letter are not significantly different. Duncans New MRT 5%.

Net $/A: Assume a $40 beet payment and trial average RWST with fungicide costs subtracted off.
Bold: Results are not statistically different from top-ranking treatment in each column.

Control of *Alternaria alternata* and *Cercospora beticola* Leafspot with Registered and Experimental Fungicides
Answer Plot, Bach, MI - 2018

No.	Treatment	Rate / A	% Leaf Damage 9-Oct	Net $/A	RWSA	RWST	T/A	% SUC
1	Inspire + Manzate + Masterlock (7/2)	7 fl oz + 1.6 qt + 6.4 fl oz	9.7 ef	**$1,235 abc**	**8428 abc**	**254 ab**	**33.1 ab**	**17.3 a**
	Manzate + Masterlock (7/19, 8/13, 9/4)	1.6 qt + 6.4 fl oz						
	Proline + Manzate + Masterlock (7/28)	5.7 fl oz + 1.6 qt + 6.4 fl oz						
	Manzate + Badge + Masterlock (8/23)	1.6 qt + 2 pt + 6.4 fl oz						
3	Quadris + Manzate + Masterlock (7/2, 7/28)	15.5 fl oz + 1.6 qt + 6.4 fl oz	11.5 ef	$1,191 bc	8119 bc	**252 ab**	32.2 b	**16.9 a**
	Manzate + Masterlock (7/17, 8/9, 8/30)	1.6 qt + 6.4 fl oz						
	Manzate + Badge + Masterlock (8/23)	1.6 qt + 2 pt + 6.4 fl oz						
2	Priaxor + Manzate + Masterlock (7/2, 7/28)	8 fl oz + 1.6 qt + 6.4 fl oz	12.9 de	**$1,270 abc**	**8790 ab**	**259 ab**	**34.0 ab**	**17.3 a**
	Manzate + Masterlock (7/17, 8/9, 8/30)	1.6 qt + 6.4 fl oz						
	Manzate + Badge + Masterlock (8/23)	1.6 qt + 2 pt + 6.4 fl oz						
7	Propulse + Manzate + Masterlock (7/2, 7/28)	13.6 fl oz + 1.6 qt + 6.4 fl oz	14.3 cde	**$1,280 abc**	**9068 a**	**256 ab**	**35.4 a**	**17.3 a**
	Manzate + Masterlock (7/19, 8/13, 9/4)	1.6 qt + 6.4 fl oz						
	Manzate + Badge + Masterlock (8/23)	1.6 qt + 2 pt + 6.4 fl oz						

Means followed by the same letter are not significantly different. Duncans New MRT 5%.

Net $/A: Assume a $40 beet payment and trial average RWST with fungicide costs subtracted off.
Bold: Results are not statistically different from top-ranking treatment in each column.

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Control of *Alternaria alternata* and *Cercospora beticola* Leafspot with Registered and Experimental Fungicides

Answer Plot, Bach, MI - 2018

No.	Treatment	Rate / A	% Leaf Damage 9-Oct	Net $/A	RWSA	RWST	T/A	% SUC
11	Manzate + Badge + Masterlock (7/2, 7/12, 7/23, 8/2, 8/13, 8/23, 9/4, 9/12)	1.6 qt + 2 pt + 6.4 fl oz	19.1 cd	$1,165 c	**8302 abc**	247 b	**33.6 ab**	**16.7 a**
12	Echo + Masterlock (7/2, 7/17, 7/31, 8/13, 8/30, 9/12)	2 pt + 6.4 fl oz	19.5 c	**$1,324 a**	**8789 ab**	**257 ab**	**34.2 ab**	**17.3 a**
9	Manzate + Masterlock (7/2, 7/12, 7/23, 8/2, 8/13, 8/23, 9/4, 9/12)	1.6 qt + 6.4 fl oz	26.0 b	**$1,317 a**	**8758 ab**	**253 ab**	**34.6 ab**	**17.0 a**
10	Badge + Masterlock (7/2, 7/12, 7/23, 8/2, 8/13, 8/23, 9/4, 9/12)	6.4 fl oz + 2 pt	28.0 b	$1,170 c	7978 c	**248 ab**	32.1 b	**16.8 a**
13	Untreated		60.8 a	$1,015 d	6362 d	214 c	29.7 c	14.7 b
	Average		17.09	1240.2	8400.8	250.8	33.46	16.96
	LSD 5%		6.06	104.6	655.7	12.2	2.28	0.74
	CV %		24.7	5.9	5.4	3.4	4.7	3.0

Means followed by the same letter are not significantly different. Duncans New MRT 5%.
All treatments were started on June 30th.

Comments: This small plot replicated trial was conducted to evaluate fungicides for control of Alternaria (*Alternaria alternata*) and Cercospora (*Cercospora beticola*) leafspot in sugarbeets. The leafspot infection level was high and consisted of Alternaria (50%) and Cercospora (50%). The Super Tin + Topsin + Manzate spray program provided good control of leafspot and Super Tin + Manzate gave fair control. The Minerva Duo program, Triazole Program and Quadris program were somewhat less effective but were superior to the Priaxor and Propulse programs. Manzate + Badge (8 applic) and Echo treatments (6 applic) provided some level of control and were slightly superior to Badge and Manzate treatments (8 applic). All treatments were significantly better than the Untreated Check. Masterlock (sticker / spreader) was included in all treatments. The Untreated plots lost 4-5 tons/acre and almost 2 points of sugar. Echo is not a registered product and can not be used in sugarbeets.

Net $/A: Assume a $40 beet payment and trial average RWST with fungicide costs subtracted off.
Bold: Results are not statistically different from top-ranking treatment in each column.

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Control of *Alternaria alternata* and *Cercospora beticola* Leafspot with Registered and Experimental Fungicides

Laker Agronomy Field, Elkton, MI - 2018

Trial Quality: Fair-Good
Variety: C-RR059
Planted: May 2
Harvested: Oct 18
Plots: 6 rows X 38 ft, 4 reps
Row Spacing: 22 inches

Soil Info: Clay Loam
%OM: 2.7 **pH:** 6.3 **CEC:** 16.3
P: above opt **K:** above opt
Mn: high **B:** low
Added N: 135 lbs
Prev Crop: Soybeans

Rhizoc Level: Low
Cerc Control: See trts.
Problems: None
Seeding Rate: 4.1 inches
Rainfall: 21.6 inches
Beets/100 ft: ~170

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

No.	Treatment*	Rate /A	% Leafspot Damage		Net $/A	RWSA	RWST	T/A	% SUC
			18-Sep	7-Sep					
12	Echo + Masterlock (7/6, 7/17, 7/30, 8/10, 8/22, 8/30)	2.5 pt + 6.4 fl oz	**4.0 j**	**1.2 g**	**$1,164 a**	**7324 a**	**251 a**	**29.2 ab**	**17.0 a**
8	Manzate + Super Tin + Topsin + Masterlock (7/6, 7/30, 8/28)	1.6 qt + 8 fl oz + 20 fl oz + 6.4 fl oz	**4.5 j**	**1.7 g**	$998 bc	6454 b	**248 ab**	25.9 bc	**16.8 ab**
	Badge + Masterlock (7/16, 8/13)	1.6 qt + 2 pt +							
2	Manzate + Proline + Masterlock (7/6, 8/30)	1.6 qt + 5.7 fl oz + 6.4 fl oz	**11.1 ij**	**1.2 g**	$979 bc	6228 bc	237 b-e	26.3 bc	16.2 b-e
	Manzate + Super Tin + Masterlock (7/25)	1.6 qt + 8 fl oz + 6.4 fl oz							
	Badge + Masterlock (8/10)	2 pt							
7	Manzate + Super Tin + Masterlock (7/6, 7/30, 8/28)	1.6 qt + 8 fl oz + 6.4 fl oz	**11.8 ij**	**4.0 efg**	**$1,175 a**	**7280 a**	**242 abc**	**30.1 a**	**16.4 abc**
	Badge + Masterlock (7/19, 8/13)	2 pt + 6.4 fl oz							
9	Manzate + Masterlock (7/6, 7/16, 7/25, 8/4, 8/14, 8/28, 9/7)	1.6 qt + 6.4 fl oz	**14.5 hij**	**4.5 efg**	$948 bcd	5933 bc	231 c-f	25.7 c	15.8 c-f

* All treatments were sprayed with maintenance spray of Badge @ 2 pt/A and Masterlock @ 6.4 fl oz/A on 9/18

Means followed by the same letter are not significantly different. Duncans New MRT 5%.

Net $/A: Assume a $40 beet payment and trial average RWST with fungicide costs subtracted off.

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

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Control of *Alternaria alternata* and *Cercospora beticola* Leafspot with Registered and Experimental Fungicides

Laker Agronomy Field, Elkton, MI - 2018

No.	Treatment*	Rate / A	% Leafspot Damage		Net $/A	RWSA	RWST	T/A	% SUC
			18-Sep	7-Sep					
13	Manzate + Propulse + Masterlock (7/6, 8/30)	1.6 qt + 13.6 fl oz + 6.4 fl oz	**17.3 g-j**	**2.1 g**	$807 de	5539 bcd	229 c-f	24.1 c	15.7 c-f
	Manzate + Super Tin + Masterlock (7/25)	1.6 qt + 8 fl oz + 6.4 fl oz							
	Badge + Masterlock (8/10)	2 pt							
6	Manzate + Priaxor + Masterlock (7/6, 8/13)	1.6 qt + 8 fl oz + 6.4 fl oz	18.8 f-i	**6.4 efg**	$957 bcd	6319 bc	236 b-e	26.7 bc	16.1 b-e
	Manzate + Super Tin + Masterlock (7/19, 8/30)	1.6 qt + 8 fl oz + 6.4 fl oz							
	Badge + Masterlock (8/2)	2 pt + 6.4 fl oz							
1	Manzate + Inspire XT + Masterlock (7/6, 8/30)	1.6 qt + 7 fl oz + 6.4 fl oz	21.4 f-i	9.0 c-f	$944 bcd	5970 bc	232 c-f	25.8 bc	15.9 c-f
	Manzate + Super Tin + Masterlock (7/25)	1.6 qt + 8 fl oz + 6.4 fl oz							
	Badge + Masterlock (8/10)	2 pt							
4	Manzate + Quadris + Masterlock (7/6, 8/13)	1.6 qt + 15.5 fl oz + 6.4 fl oz	25.5 e-h	**3.2 fg**	$1,011 b	6466 b	**240 a-d**	**27.0 abc**	**16.3 a-d**
	Manzate + Super Tin + Masterlock (7/19, 8/30)	1.6 qt + 8 fl oz + 6.4 fl oz							
	Badge + Masterlock (8/2)	2 pt + 6.4 fl oz							

* All treatments were sprayed with maintenance spray of Badge @ 2 pt/A and Masterlock @ 6.4 fl oz/A on 9/18

Means followed by the same letter are not significantly different. Duncans New MRT 5%.

Net $/A: Assume a $40 beet payment and trial average RWST with fungicide costs subtracted off.

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

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Control of *Alternaria alternata* and *Cercospora beticola* Leafspot with Registered and Experimental Fungicides

Laker Agonomy Field, Elkton, MI - 2018

No.	Treatment*	Rate / A	% Leafspot Damage		Net $/A	RWSA	RWST	T/A	% SUC
			18-Sep	7-Sep					
5	Manzate + Gem + Masterlock (7/6, 8/13)	1.6 qt + 3.6 fl oz + 6.4 fl oz	29.6 d-g	15.0 b	$888 b-e	5848 bc	229 c-f	25.5 c	15.8 c-f
	Manzate + Super Tin + Masterlock (7/19, 8/30)	1.6 qt + 8 fl oz + 6.4 fl oz							
	Badge + Masterlock (8/2)	2 pt + 6.4 fl oz							
3	Manzate + Topguard + Masterlock (7/6, 8/30)	1.6 qt + 14 fl oz + 6.4 fl oz	31.1 b-f	**2.1 g**	$937 bcd	5942 bc	224 ef	26.5 bc	15.5 def
	Manzate + Super Tin + Masterlock (7/25)	1.6 qt + 8 fl oz + 6.4 fl oz							
	Badge + Masterlock (8/10)	2 pt							
11	Manzate + Badge + Masterlock (7/6, 7/16, 7/25, 8/4, 8/14, 8/28, 9/7)	1.6 qt + 2 pt + 6.4 fl oz	35.5 b-e	8.1 def	$858 b-e	5808 bc	227 def	25.6 c	15.6 c-f
10	Badge + Masterlock (7/6, 7/16, 7/25, 8/4, 8/14, 8/28, 9/7)	2 pt + 6.4 fl oz	38.1 b-e	12.1 bcd	$916 b-e	5863 bc	232 c-f	25.2 c	15.9 c
14	Untreated		95.0 a	80.6 a	$817 de	4762 d	227 def	20.9 d	15.7 c-f
Average			25.58	10.81	957.2	6124.1	234.7	26.04	16.05
LSD 5%			11.78	5.09	134.4	783.2	12.0	3.02	0.67
CV %			28.1	33.2	10.1	9.1	3.6	8.2	2.97

* All treatments were sprayed with maintenance spray of Badge @ 2 pt/A and Masterlock @ 6.4 fl oz/A on 9/18

Means followed by the same letter are not significantly different. Duncans New MRT 5%.

Comments: Super Tin + Topsin + Manzate (5 applic) and Echo (6 applic) were the only treatments that provided adequate leafspot control. The addition of Topsin to Super Tin improved the performance of Super Tin. Strobi and Triazole based treatments were less effective. The leafspot pressure was very high and consisted of Cercospora (*Cercospora beticola*) and Alternaria (*Alternaria alternata*) leafspot. The infection was approximately 50% Cercospora and 50% Alternaria. Untreated plots lost 7-8 tons/acre and 1-2 points of sugar. Echo is not an approved treatment and cannot be used in sugarbeets.

Net $/A: Assume a $40 beet payment and trial average RWST with fungicide costs subtracted off.

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

Control of *Alternaria alternata* and *Cercospora beticola* Leafspot with Registered and Experimental Fungicides

Wark, Akron, MI - 2018

Trial Quality: Fair-Good
Variety: B-149N
Planted: May 8
Harvested: Oct 5
Plots: 6 rows X 38 ft, 4 reps
Row Spacing: 22 inches

Soil Info: Loam
%OM: 2.1 **pH:** 7.8 **CEC:** 15.9
P: below opt **K:** above opt
Mn: high **B:** medium
Added N: 135 lbs
Prev Crop: Soybeans

Rhizoc Level: Low
Cerc Control: See trts.
Problems: Slope
Seeding Rate: 4.1 inches
Rainfall: 17.1 inches
Beets/100 ft: ~200

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

No.	Treatment	Rate /A	% Leafspot Damage		Net $/A	RWSA	RWST	T/A	% SUC
			20-Sep	28-Aug					
10	Super Tin + Topsin + Manzate + Masterlock (7/5, 8/10)	8 fl oz + 20 fl oz + 1.6 qt + 6.4 fl oz	**4.5 e**	**1.7 g**	**$1,600 a**	**7185 a**	**204 ab**	**35.2 ab**	**14.2 a**
	Badge + Manzate + Masterlock (7/19, 7/30, 8/30)	2 pt + 1.6 qt + 6.4 fl oz							
15	Echo + Masterlock (7/5 ,7/17, 7/30, 8/10, 8/30)	2.5 pt + 6.4 fl oz	**6.9 e**	**2.7 fg**	**$1,504 ab**	**6636 abc**	**201 abc**	**33.0 a-d**	**13.9 ab**
9	Super Tin + Topsin + Manzate + Masterlock (7/5, 8/10)	8 fl oz + 10 fl oz + 1.6 qt + 6.4 fl oz	**7.6 e**	**3.0 fg**	**$1,551 ab**	**6978 ab**	**208 a**	**33.5 abc**	**14.3 a**
	Badge + Manzate + Masterlock (7/19, 7/30, 8/30)	2 pt + 1.6 qt + 6.4 fl oz							
6	Gem + Manzate + Masterlock (7/5, 8/10)	3.6 fl oz + 1.6 qt + 6.4 fl oz	**9.9 e**	**3.8 fg**	**$1,539 ab**	**6951 ab**	**197 a-e**	**35.3 a**	**13.6 a-d**
	Super Tin + Manzate + Masterlock (7/19, 8/30)	8 fl oz + 1.6 qt + 6.4 fl oz							
	Badge + Masterlock (8/2)	2 pt + 6.4 fl oz							
7	Priaxor + Manzate + Masterlock (7/5, 8/10)	8 fl oz + 1.6 qt + 6.4 fl oz	**11.0 e**	**4.6 fg**	$1,357 bcd	6237 b-e	191 b-f	**32.6 a-f**	13.4 b-e
	Super Tin + Manzate + Masterlock (7/19, 8/30)	8 fl oz + 1.6 qt + 6.4 fl oz							
	Badge + Masterlock (8/2)	2 pt + 6.4 fl oz							
5	Quadris + Manzate + Masterlock (7/5, 8/10)	15 fl oz + 1.6 qt + 6.4 fl oz	**11.6 e**	**4.9 fg**	$1,372 bcd	6181 b-e	190 c-f	**32.5 a-f**	13.4 b-e
	Super Tin + Manzate + Masterlock (7/19, 8/30)	8 fl oz + 1.6 qt + 6.4 fl oz							
	Badge + Masterlock (8/2)	2 pt + 6.4 fl oz							

Means followed by the same letter are not significantly different. Duncans New MRT 5%.

* All treatments were sprayed with a maintenance spray of Badge @ 2pt/A and Masterlock @ 6.4 fl oz/A on 9/18

Net $/A: Assume a $40 beet payment and trial average RWST with fungicide costs subtracted off.
Bold: Results are not statistically different from top-ranking treatment in each column.

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Control of *Alternaria alternata* and *Cercospora beticola* Leafspot with Registered and Experimental Fungicides
Wark, Akron, MI - 2018

No.	Treatment	Rate / A	% Leafspot Damage		Net $/A	RWSA	RWST	T/A	% SUC
			20-Sep	28-Aug					
8	Super Tin + Manzate + Masterlock (7/5, 8/10)	8 fl oz + 1.6 qt + 6.4 fl oz	**11.8 e**	**5.1 fg**	**$1,439 abc**	**6433 a-d**	**201 abc**	32.0 b-f	**13.9 ab**
	Badge + Manzate + Masterlock (7/19, 7/30, 8/30)	2 pt + 1.6 qt + 6.4 fl oz							
11	Manzate + Masterlock (7/5, 7/16, 7/26, 8/10, 8/30)	1.6 qt + 6.4 fl oz	**18.0 de**	**7.8 efg**	$1,288 c-f	5625 d-g	187 d-g	30.0 d-h	13.0 c-f
2	Proline + Manzate + Masterlock (7/5, 8/30)	5.7 fl oz + 1.6 qt + 6.4 fl oz	27.6 cd	**11.5 efg**	**$1,442 abc**	**6450 a-d**	**197 a-d**	**32.6 a-e**	**13.8 abc**
	Super Tin + Manzate + Masterlock (7/26)	8 fl oz + 1.6 qt + 6.4 fl oz							
	Badge + Masterlock (8/10)	2 pt + 6.4 fl oz							
1	Inspire XT + Manzate + Masterlock (7/5, 8/30)	7 fl oz + 1.6 qt + 6.4 fl oz	28.1 cd	**12.5 efg**	$1,290 c-f	5752 d-g	185 d-g	31.2 c-g	12.9 def
	Super Tin + Manzate + Masterlock (7/26)	8 fl oz + 1.6 qt + 6.4 fl oz							
	Badge + Masterlock (8/10)	2 pt + 6.4 fl oz							
3	Minerva + Manzate + Masterlock (7/5, 8/30)	13 fl oz + 1.6 qt + 6.4 fl oz	31.8 cd	12.1 efg	$1,238 c-f	5548 efg	189 c-f	29.3 fgh	13.2 b-f
	Super Tin + Manzate + Masterlock (7/26)	8 fl oz + 1.6 qt + 6.4 fl oz							
	Badge + Masterlock (8/10)	2 pt + 6.4 fl oz							
4	Topguard + Manzate + Masterlock (7/5, 8/30)	14 fl oz + 1.6 qt + 6.4 fl oz	35.5 c	15.4 ef	$1,275 c-f	5700 d-g	192 b-f	29.8 d-h	13.3 b-e
	Super Tin + Manzate + Masterlock (7/26)	8 fl oz + 1.6 qt + 6.4 fl oz							
	Badge + Masterlock (8/10)	2 pt + 6.4 fl oz							

* All treatments were sprayed with a maintenance spray of Badge @ 2pt/A and Masterlock @ 6.4 fl oz/A on 9/18

Means followed by the same letter are not significantly different. Duncans New MRT 5%.

Net $/A: Assume a $40 beet payment and trial average RWST with fungicide costs subtracted off.

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

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Control of *Alternaria alternata* and *Cercospora beticola* Leafspot with Registered and Experimental Fungicides

Wark, Akron, MI - 2018

No.	Treatment	Rate / A	% Leafspot Damage		Net $/A	RWSA	RWST	T/A	% SUC
			20-Sep	28-Aug					
13	Manzate + Masterlock (7/5)	1.6 qt + 6.4 fl oz	38.1 c	18.6 de	$1,195 def	5413 efg	184 d-g	29.3 e-h	12.9 def
	Manzate + Badge + Masterlock (7/16, 7/26, 8/10, 8/30)	1.6 qt + 2 pt + 6.4 fl oz							
17	Topguard + Manzate + Masterlock (7/5, 8/30)	14 fl oz + 1.6 qt + 6.4 fl oz	57.5 b	31.7 c	$1,181 def	5252 fg	184 d-g	28.6 gh	12.9 def
	Super Tin + Manzate + Masterlock (7/26)	8 fl oz + 1.6 qt + 6.4 fl oz							
	Badge + Masterlock (8/10)	2 pt + 6.4 fl oz							
16	Propulse + Manzate + Masterlock (7/5, 8/30)	13.6 fl oz + 1.6 qt + 6.4 fl oz	57.5 b	28.6 cd	$1,138 ef	5398 efg	181 fg	29.9 d-h	12.7 ef
	Super Tin + Manzate + Masterlock (7/26)	8 fl oz + 1.6 qt + 6.4 fl oz							
	Badge + Masterlock (8/10)	2 pt + 6.4 fl oz							
14	Cuprofix + Masterlock (7/5, 7/16, 7/26, 8/10, 8/30)	2 lb + 6.4 fl oz	62.5 b	47.8 b	$1,117 f	4986 g	175 gh	28.4 gh	12.4 fg
12	Badge + Masterlock (7/5, 7/16, 7/26, 8/10, 8/30)	2 pt + 6.4 fl oz	68.8 b	36.3 c	$1,235 c-f	5457 efg	186 d-g	29.3 e-h	13.1 c-f
18	Untreated		95.0 a	27.5 cd	$1,178 def	4952 g	184 efg	27.0 h	12.9 def
	Average		32.42	15.30	$1,330.0	5951.7	190.9	31.08	13.32
	LSD 5%		14.48	11.11	178.2	748.9	11.5	2.78	0.70
	CV %		29.1	43.9	9.7	9.1	4.3	6.4	3.8

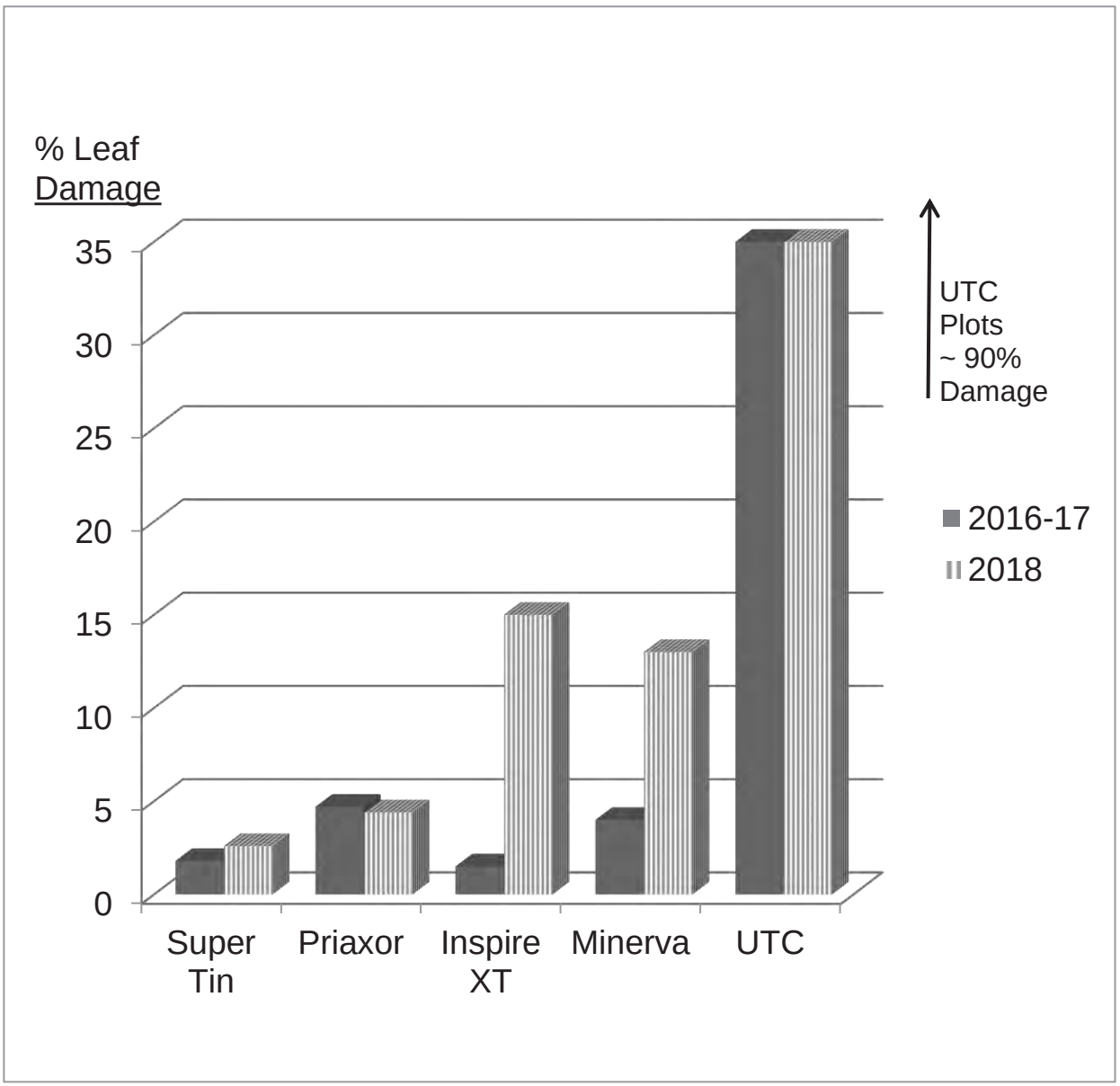
* All treatments were sprayed with a maintenance spray of Badge @ 2pt/A and Masterlock @ 6.4 fl oz/A on 9/18
Means followed by the same letter are not significantly different. Duncans New MRT 5%.

Comments: Super Tin + Topsin + Manzate (5 applic) and Echo (6 applic) gave the best leafspot control in this trial. Cercospora (*Cercospora beticola*) and (*Alternaria alternata*) leafspot infestation levels were very high. The Cercospora to Alternaria ratio was about 50:50. The addition of Topsin to Super Tin improved the performance of Super Tin. Strobilurin based treatments provided better leafspot control than did Triazole based treatments. Untreated plots lost 5 tons/acre and 1-2 points of sugar. Echo is not an approved treatment and cannot be used in sugarbeets.

Net $/A: Assume a $40 beet payment and trial average RWST with fungicide costs subtracted off.
Bold: Results are not statistically different from top-ranking treatment in each column.

Control of Cercospora and Alternaria Leafspot in Sugarbeets with Tank Mix Fungicide Treatments

Average of 6 Locations - 2016, 2017 and 2018



Comments: Six fungicide tank mix leafspot trials were conducted by Michigan Sugar from 2016 to 2018. Cercospora leafspot (*Cercospora beticola*) and Alternaria leafspot (*Alternaria alternata*) were present in the trials at an estimated ratio 60% : 40% in 2016-17 and close to a 50% : 50% ratio in 2018. Leafspot pressure was very high in all trials. Fungicide treatments were applied with a compressed air small plot sprayer mounted on a compact tractor in 25 gallons of water per acre at 100 PSI. Super Tin and Minerva Duo provided good leafspot control and the need for a tank mix partner was less than for triazole and strobilurin fungicides. Triazole fungicides (Inspire XT and Minerva) tank mixed with Manzate MAX provided good leafspot control in 2016-17 trials but not in 2018. Priaxor (strobilurin fungicide) gave fairly good control in 2016, 2017 and 2018. Alternaria infestations appear to be increasing and that would favor strobilurin over triazole fungicides. Tank mixing improved results for all fungicides but especially for the triazole and strobilurin groups. Sugarbeet yields, quality and grower income followed leaf damage.

Control of Cercospora and Alternaria Leafspot in Sugarbeets with Tank Mix Fungicide Treatments

Average of 6 Locations - 2016, 2017 and 2018

2 Michigan Locations (2018)

No.	Treatment	Tank Mix	fl oz/ acre	% Leafspot Damage	Net $/A	RWSA	RWST	T/A	% Sugar
8	Super Tin 4L	Yes	8	**2.6 d**	**$1,130 a**	**6442 a**	**216 a**	**29.5 a**	**14.9 a**
10	Priaxor	Yes	8	**4.4 cd**	**$1,000 abc**	**6126 ab**	**216 a**	**27.8 ab**	**14.9 a**
7	Super Tin 4L	No	8	**6.1 cd**	**$1,083 ab**	**6026 abc**	**214 ab**	**27.9 ab**	**14.8 a**
2	Inspire XT	Yes	7	**15.2 cd**	**$1,041 abc**	**6054 abc**	**212 ab**	**28.2 ab**	**14.7 ab**
4	Minerva	Yes	13	18.4 c	**$1,121 a**	**6437 a**	**213 ab**	**30.0 a**	**14.7 ab**
3	Minerva	No	13	39.3 b	$945 bcd	5303 bc	199 cd	26.2 b	13.9 c
9	Priaxor	No	8	47.1 b	$905 cd	5275 bc	201 cd	25.8 b	14.2 bc
1	Inspire XT	No	7	52.4 b	$929 bcd	5240 c	205 bc	25.7 b	14.2 bc
11	Untreated Check			90.7 a	$803 d	4366 c	191 d	22.8 b	13.3 d

Average	30.70	$995.3	5696.5	207.4	27.10	14.40
LSD 5%	13.04	155.2	788.9	9.9	2.78	0.55
CV%	27.3	10.0	8.9	3.1	6.6	2.4

4 Michigan Locations (2016 - 2017)

No.	Treatment	Tank Mix	fl oz/ acre	% Leafspot Damage	Net $/A	RWSA	RWST	T/A	% Sugar
6	Minerva Duo	Yes	16	**1.1 g**	**$1,425 a**	**9570 a**	**256 abc**	**38.2 ab**	**17.3 ab**
2	Inspire XT	Yes	7	**1.4 fg**	**$1,389 ab**	**9638 a**	**258 a**	**38.4 a**	**17.5 a**
8	Super Tin	Yes	8	**1.8 fg**	**$1,359 a-d**	**9087 abc**	**252 a-d**	**37.3 abc**	**17.2 abc**
5	Minerva Duo	No	16	**2.1 fg**	**$1,391 ab**	**9499 ab**	**257 ab**	**37.7 abc**	**17.5 a**
7	Super Tin	No	8	3.2 ef	**$1,370 abc**	**9058 abc**	251 bcd	**37.4 abc**	17.1 bcd
4	Minerva	Yes	13	4.0 de	$1,289 bcd	**9117 abc**	250 cd	**37.6 abc**	17.1 bcd
10	Priaxor	Yes	8	4.7 de	$1,263 de	8878 c	248 de	36.6 bcd	16.9 cde
1	Inspire XT	No	7	5.3 d	$1,307 bcd	8954 bc	248 de	**37.2 abc**	17.0 cde
3	Minerva	No	13	9.9 c	$1,268 cde	8638 cd	246 de	36.3 cd	16.8 de
9	Priaxor	No	8	23.0 b	$1,188 e	8277 d	243 e	35.4 d	16.7 e
11	Untreated Check			92.8 a	$1,044 f	6750 e	215 e	32.4 d	15.1 e

Average	13.58	$1,299.5	8860.6	247.8	36.76	16.92
LSD 5%	1.68	92.9	523.2	5.9	1.43	0.33
CV%	8.2	4.7	3.9	1.6	2.6	1.3

Means followed by the same letter are not significantly different. Duncans New MRT 5%.

Net $/A: Assume a $40 beet payment and trial average RWST with fungicide costs subtracted off.
Bold: Results are not statistically different from top-ranking treatment in each column.

Control of Cercospora and Alternaria Leafspot in Sugarbeets with Tank Mix Fungicide Treatments

Avg of 2 Locations Elkton, Pinconning - 2018

Trial Quality: Fair-Good
Variety: C-G333NT
Plots: 6 rows X 38 ft, 4 reps
Row Spacing: 22 inches
Soil and other Info: See individual trials
Application: JD 3520 tractor mounted plot sprayer, compressed air, 100 psi, 25 gpa
Rhizoc Level: Low
Cerc Control: See trts.
Problems: None
Seeding Rate: 4.1 inches
Beets/100 ft: ~210

No.	Treatment***	Tank Mix**	% Leafspot Damage						Net $/A	
			Avg 2		24-Sep		3-Sep			
8	Super Tin + Topsin* Badge* Manzate*	Yes	**1.4**	**g**	**2.0**	**g**	**0.9**	**e**	**$1,195**	**a**
7	Super Tin* Badge* Manzate*	Yes	**2.0**	**g**	**2.5**	**g**	**1.6**	**e**	**$1,127**	**ab**
10	Priaxor* Super Tin* Badge* Manzate*	Yes	**2.9**	**g**	**4.0**	**fg**	**1.8**	**de**	$1,015	c-g
9	Gem SC* Super Tin* Badge*	Yes	**3.0**	**g**	**4.1**	**fg**	**1.9**	**cde**	$1,004	c-h
19	Super Tin + Topsin* Badge* Super Tin* Manzate*	No	**3.6**	**fg**	**4.3**	**fg**	**3.0**	**cde**	$1,092	bc
2	Proline + Preference* Super Tin* Badge*	Yes	**4.3**	**fg**	**5.7**	**fg**	**3.0**	**cde**	$1,047	b-f
18	Super Tin* Badge* Super Tin* Manzate*	No	**4.7**	**fg**	**5.7**	**fg**	**3.7**	**cde**	**$1,119**	**ab**
3	Minerva* Super Tin* Badge*	Yes	9.0	ef	15.0	ef	**3.0**	**cde**	$1,084	bc
1	Inspire XT* Super Tin* Badge*	Yes	9.3	ef	13.8	ef	4.8	c	$1,053	b-f
11	Manzate* (6 applic)	No	11.4	e	21.1	e	**1.8**	**de**	$1,066	bcd
5	Topguard* Super Tin* Badge* Manzate*	Yes	11.5	e	19.5	e	**3.5**	**cde**	$1,021	c-g

Means followed by the same letter are not significantly different. Duncans New MRT 5%.

*Fungicides applied at recommended rates and included Masterlock at 6.4 fl oz/A.

****Tank Mix:** Treatment is tank mixed with Manzate Max (1.6 qt/a)

***All Treatments were sprayed with a maintenance spray of Badge @ 2pt/A and Masterlock @ 6.4 fl oz/A on 9/18

Net $/A: Assume a $40 beet payment and trial average RWST with fungicide costs subtracted off.

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

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Control of Cercospora and Alternaria Leafspot in Sugarbeets with Tank Mix Fungicide Treatments

Avg of 2 Locations Elkton, Pinconning - 2018

No.	Treatment***	Tank Mix**	% Leafspot Damage						Net $/A	
			Avg 2		24-Sep		3-Sep			
4	Enable + Preference* Super Tin* Badge* Manzate*	Yes	14.6	e	24.5	e	4.7	cd	$970	d-h
14	Minerva* Super Tin* Badge* Manzate*	No	24.3	cd	39.1	cd	9.5	b	$959	e-h
20	Gem SC* Super Tin* Badge*	No	24.8	cd	40.8	cd	8.8	b	$1,014	c-g
13	Proline + Preference* Super Tin* Badge* Manzate*	No	25.5	bcd	41.5	bcd	9.6	b	$1,005	c-h
21	Priaxor* Super Tin* Badge*	No	27.7	bcd	46.2	bcd	9.3	b	$910	h
15	Enable + Preference* Super Tin* Badge* Manzate*	No	29.0	bc	49.0	bc	9.1	b	$1,006	c-h
12	Inspire* Super Tin* Badge* Manzate*	No	29.4	bc	49.8	bc	9.0	b	$954	fgh
16	Topguard* Super Tin* Badge* Manzate*	No	31.4	b	51.9	b	10.9	b	$944	gh
22	Manzate* (3 applic)	No	64.1	a	88.4	a	39.9	a	$819	i
	Average		16.70		26.45		6.84		$1,020.2	
	LSD 5%		5.30		9.62		2.54		82.4	
	CV %		25.1		28.7		29.2		6.4	

Means followed by the same letter are not significantly different. Duncans New MRT 5%.

*Fungicides applied at recommended rates and included Masterlock at 6.4 fl oz/A.

****Tank Mix:** Treatment is tank mixed with Manzate Max (1.6 qt/a)

***All Treatments were sprayed with a maintenance spray of Badge @ 2pt/A and Masterlock @ 6.4 fl oz/A on 9/18

Net $/A: Assume a $40 beet payment and trial average RWST with fungicide costs subtracted off.

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

Control of Cercospora and Alternaria Leafspot in Sugarbeets with Tank Mix Fungicide Treatments

Avg of 2 Locations Elkton, and Pinconning - 2018

No.	Treatment***	Tank Mix**	RWSA		RWST		T/A		% Suc		% CJP	
8	Super Tin + Topsin* Badge* Manzate*	Yes	**6877**	**a**	**221**	**a**	**31.1**	**a**	**15.0**	**a**	**95.4**	**a**
7	Super Tin* Badge* Manzate*	Yes	**6471**	**ab**	**220**	**ab**	**29.5**	**ab**	**15.0**	**ab**	**95.3**	**ab**
10	Priaxor* Super Tin* Badge* Manzate*	Yes	6128	b-e	**218**	**abc**	28.1	bcd	**14.9**	**abc**	**95.3**	**abc**
9	Gem SC* Super Tin* Badge* Manzate*	Yes	6010	b-e	212	c-f	28.3	bcd	14.6	b-f	**95.0**	**a-g**
19	Super Tin + Topsin* Badge* Manzate*	No	6117	b-e	212	d-g	28.9	bc	14.6	b-f	94.9	d-g
2	Proline + Preference* Super Tin* Badge* Manzate*	Yes	6070	b-e	214	b-e	28.3	bcd	**14.8**	**a-e**	94.7	fg
18	Super Tin* Badge* Super Tin* Manzate*	No	6207	bcd	**215**	**a-d**	28.8	bc	**14.8**	**a-d**	94.9	c-g
3	Minerva* Super Tin* Badge* Manzate*	Yes	6240	bc	211	d-g	**29.5**	**ab**	14.5	c-h	**95.0**	**a-g**
1	Inspire XT* Super Tin* Badge* Manzate*	Yes	6076	b-e	214	b-e	28.4	bcd	14.6	b-f	**95.2**	**a-d**
11	Manzate* (6 applic)	No	5854	c-g	211	d-g	27.7	b-e	14.5	c-i	**95.1**	**a-e**
5	Topguard* Super Tin* Badge* Manzate*	Yes	5918	c-f	210	d-g	28.1	bcd	14.5	c-i	94.9	b-g

Means followed by the same letter are not significantly different. Duncans New MRT 5%.

*Fungicides applied at recommended rates and included Masterlock at 6.4 fl oz/A.

****Tank Mix:** Treatment is tank mixed with Manzate Max (1.6 qt/a)

***All treatments were sprayed with a maintenance spray of Badge @ 2pt/A and Masterlock @ 6.4 fl oz/A on 9/18

Net $/A: Assume a $40 beet payment and trial average RWST with fungicide costs subtracted off.

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

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Control of Cercospora and Alternaria Leafspot in Sugarbeets with Tank Mix Fungicide Treatments

Avg of 2 Locations Elkton, and Pinconning - 2018

No.	Treatment***	Tank Mix**	RWSA		RWST		T/A		% Suc		% CJP	
4	Enable + Preference* Super Tin* Badge* Manzate*	Yes	5637	e-h	213	c-f	26.5	de	14.6	c-g	**95.2**	**a-e**
14	Minerva* Super Tin* Badge* Manzate*	No	5395	gh	202	h	26.7	de	14.0	j	**95.0**	**a-f**
20	Gem SC* Super Tin* Badge*	No	5771	c-h	211	d-g	27.4	b-e	14.5	d-i	**95.2**	**a-e**
13	Proline + Preference* Super Tin* Badge* Manzate*	No	5696	d-h	205	gh	27.8	b-e	14.2	hij	**95.0**	**a-g**
21	Priaxor* Super Tin* Badge*	No	5291	h	204	h	26.0	e	14.2	g-j	94.5	g
15	Enable + Preference* Super Tin* Badge* Manzate*	No	5641	e-h	206	fgh	27.4	b-e	14.2	hij	**95.2**	**a-e**
12	Inspire XT* Super Tin* Badge* Manzate*	No	5376	gh	207	fgh	25.9	e	14.2	f-j	**95.0**	**a-f**
16	Topguard* Super Tin* Badge* Manzate*	No	5331	h	205	gh	26.0	e	14.1	ij	**95.0**	**a-f**
22	Manzate* (3 applic)	No	4453	i	192	i	23.2	f	13.4	k	94.7	efg

Average	5828.0	210.2	27.68	14.46	95.03
LSD 5%	432.1	5.7	1.79	0.34	0.38
CV %	5.9	2.2	5.1	1.9	0.3

Means followed by the same letter are not significantly different. Duncans New MRT 5%.

*Fungicides applied at recommended rates and included Masterlock at 6.4 fl oz/A.

****Tank Mix:** Treatment is tank mixed with Manzate Max (1.6 qt/a)

***All treatments were sprayed with a maintenance spray of Badge @ 2pt/A and Masterlock @ 6.4 fl oz/A on 9/18

Comments: Triazole, Strobi, and Super Tin Fungicides were applied to sugarbeets for control of Cercospora and Alternaria leafspot. Each fungicide was applied alone and in a tank mix with Manzate Max at 1.6 qt/A. The leafspot infection was very high at the Elkton site and high at the Pinconning site.

Net $/A: Assume a $40 beet payment and trial average RWST with fungicide costs subtracted off.

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

Control of Cercospora and Alternaria Leafspot in Sugarbeets with Tank Mix Fungicide Treatments

Avg of 2 Locations Elkton, and Pinconning - 2018

Fungicide Effect (Average of Tank mix and No Tank Mix)

No.	Treatment***	% Leafspot Damage			$/A	RWSA	RWST	T/A	% Suc
		Avg 2	24-Sep	3-Sep					
8	Super Tin + Topsin* Badge* Super Tin* Manzate*	**2.5 e**	**3.1 e**	**1.9 d**	**$1,143 a**	**6497 a**	**216 ab**	**30.0 a**	**14.8 ab**
7	Super Tin* Badge* Badge + Masterlock* Manzate*	**3.4 e**	**4.1 e**	**2.6 cd**	**$1,123 a**	**6339 ab**	**218 a**	**29.1 ab**	**14.9 a**
9	Gem SC* Super Tin* Badge*	13.9 d	22.5 d	5.4 bc	$1,009 b	5891 bc	**212 abc**	27.8 bc	**14.5 abc**
2	Proline + Preference* Super Tin* Badge*	14.9 d	23.6 d	6.3 b	$1,026 b	5883 bc	210 bc	28.0 abc	14.5 bc
10	Priaxor* Super Tin* Badge*	15.3 cd	25.1 cd	5.6 bc	$963 b	5710 c	**211 abc**	27.0 bcd	**14.5 abc**
3	Minerva* Super Tin* Badge*	16.6 bcd	27.0 bcd	6.2 b	$1,022 b	5818 c	207 cd	**28.1 abc**	14.3 cd
1	Inspire XT* Super Tin* Badge*	19.4 bcd	31.8 bc	6.9 b	$1,004 b	5726 c	210 bc	27.2 bcd	14.4 bc
5	Topguard* Super Tin* Badge*	21.4 bc	35.7 bc	7.2 b	$982 b	5624 cd	208 cd	27.1 bcd	14.3 cd
4	Enable + Preference* Super Tin* Badge*	21.8 b	36.8 b	6.9 b	$988 b	5639 cd	209 c	26.9 cd	14.4 c
11	Manzate*	37.8 a	54.7 a	20.9 a	$943 d	5153 c	201 d	25.4 d	13.9 e
	Average	16.70	26.44	6.98	$1,020.2	5827.9	210.1	27.68	14.45
	LSD 5%	3.74	6.80	2.54	58.3	305.5	4.0	1.27	0.24
	CV %	25.1	28.7	29.2	6.4	5.9	2.2	5.1	1.9

Tank Mix Effect (Average of all Fungicide Treatments)

No.	Treatment	% Leafspot Damage			$/A	RWSA	RWST	T/A	% Suc
		Avg 2	24-Sep	3-Sep					
1	Tank Mix	**7.4 b**	**12.1 b**	**2.8 b**	**$1,058 a**	**6124 a**	**214 a**	**28.6 a**	**14.7 a**
2	No Tank Mix	26.1 a	41.2 a	11.0 a	$982 b	5526 b	205 b	26.8 b	14.2 b
	Average	16.79	26.65	6.92	$1,019.9	5824.8	209.7	27.73	14.43
	LSD 5%	2.06	3.30	0.89	53.1	278.6	2.8	1.01	0.17
	CV %	23.2	23.4	24.3	9.8	9.0	2.5	6.9	2.2

Means followed by the same letter are not significantly different. Duncans New MRT 5%.
*Fungicides applied at recommended rates and included Masterlock at 6.4 fl oz/A.
***All treatments were sprayed with a maintenance spray of Badge @ 2pt/A and Masterlock @ 6.4 fl oz/A on 9/18

Net $/A: Assume a $40 beet payment and trial average RWST with fungicide costs subtracted off.
Bold: Results are not statistically different from top-ranking treatment in each column.

Control of Cercospora and Alternaria Leafspot in Sugarbeets with Tank Mix Fungicide Treatments

Laker Agronomy Field, Elkton, MI - 2018

Trial Quality: Good
Variety: C-G333NT
Planted: May 2
Harvested: Oct 17
Plots: 6 rows X 38 ft, 4 reps
Row Spacing: 22 inches

Soil Info: Clay Loam
% OM: 2.7 **pH:** 6.3 **CEC:** 16.3
P: above opt **K:** above opt
Mn: high **B:** low
Added N: 135 lbs
Prev Crop: Soybeans

Rhizoc Level: Low
Cerc Control: See trts.
Problems: None
Seeding Rate: 4.1 inches
Rainfall: 21.5 inches
Beets/100 ft: ~180

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

No.	Treatment***	Tank Mix**	Applic Timing	% Leafspot Damage						Net $/A	
				Avg 2		24-Sep		3-Sep			
8	Super Tin + Topsin* Badge* Manzate* (no tank mix)	Yes	7/3, 7/27, 8/20 7/17, 8/10 9/4	**1.8**	**g**	**2.7**	**f**	**1.0**	**f**	**$1,431**	**a**
10	Priaxor* Super Tin* Badge* Manzate* (no tank mix)	Yes	7/3, 8/10 7/17, 8/20 7/31 9/4	**2.8**	**g**	**4.0**	**f**	**1.7**	**f**	$1,306	bc
7	Super Tin* Badge* Manzate* (no tank mix)	Yes	7/3, 7/27, 8/20 7/17, 8/10 9/4	**3.0**	**g**	**3.2**	**f**	**2.7**	**ef**	$1,252	cde
9	Gem SC* Super Tin* Badge* Manzate* (no tank mix)	Yes	7/3, 8/10 7/17, 8/20 7/31 9/4	**3.8**	**g**	**5.3**	**f**	**2.4**	**f**	$1,215	c-f
2	Proline + Preference* Super Tin * Badge* Manzate* (no tank mix)	Yes	7/3, 8/14 7/20 8/4 8/30	**3.9**	**g**	**6.4**	**f**	**1.5**	**f**	$1,239	c-f
18	Super Tin* Badge* Manzate*	No	7/3, 7/27, 8/20 7/17, 8/10 9/4	**4.0**	**g**	**5.2**	**f**	**2.7**	**ef**	**$1,392**	**ab**
19	Super Tin + Topsin* Badge* Manzate*	No	7/3, 7/27, 8/20 7/17, 8/10 9/4	**6.0**	**fg**	**7.0**	**f**	**5.1**	**def**	$1,271	bcd
1	Inspire XT* Super Tin* Badge* Manzate* (no tank mix)	Yes	7/3, 8/14 7/20 8/4 8/30	**10.3**	**efg**	**18.6**	**ef**	**2.0**	**f**	$1,255	cde
3	Minerva* Super Tin* Badge* Manzate* (no tank mix)	Yes	7/3, 8/14 7/20 8/4 8/30	**12.1**	**efg**	**22.3**	**ef**	**1.9**	**f**	$1,258	cde
5	Topguard* Super Tin* Badge* Manzate* (no tank mix)	Yes	7/3, 8/14 7/20 8/4 8/30	15.9	ef	30.0	e	**1.7**	**f**	$1,201	c-f

Means followed by the same letter are not significantly different. Duncans New MRT 5%.

*Fungicides applied at recommended rates and included Masterlock at 6.4 fl oz/A.

****Tank Mix:** Treatment is tank mixed with Manzate Max (1.6 qt/A)

***All Treatments were sprayed with a maintenance spray of Badge @ 2pt/A and Masterlock @ 6.4 fl oz/A on 9/18

Net $/A: Assume a $40 beet payment and trial average RWST with fungicide costs subtracted off.

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

Control of Cercospora and Alternaria Leafspot in Sugarbeets with Tank Mix Fungicide Treatments

Laker Agronomy Field, Elkton, MI - 2018

No.	Treatment***	Tank Mix**	Applic Timing	% Leafspot Damage						Net $/A	
				Avg 2		24-Sep		3-Sep			
4	Enable + Preference* Super Tin* Badge* Manzate* (no tank mix)	Yes	7/3, 8/14 7/20 8/4 8/30	19.3	e	36.9	de	**1.8**	**f**	$1,161	d-g
11	Manzate* (6 applic)	No	7/3, 7/13, 7/23 8/2, 8/13, 8/23	19.8	e	37.4	de	**2.3**	**f**	$1,202	c-f
13	Proline + Preference* Super Tin* Badge* Manzate*	No	7/3, 8/14 7/20 8/4 8/30	33.9	cd	62.6	bc	**5.1**	**def**	$1,259	cde
14	Minerva* Super Tin* Badge* Manzate*	No	7/3, 8/14 7/20 8/4 8/30	34.1	cd	59.4	bc	8.8	bcd	$1,134	d-g
12	Inspire XT* Super Tin* Badge* Manzate*	No	7/3, 8/14 7/20 8/4 8/30	40.7	bc	74.4	ab	7.0	de	$1,162	d-g
15	Enable + Preference* Super Tin* Badge* Manzate*	No	7/3, 8/14 7/20 8/4 8/30	41.6	bc	73.8	ab	9.4	bcd	$1,107	fgh
16	Topguard* Super Tin* Badge* Manzate*	No	7/3, 8/14 7/20 8/4 8/30	42.1	bc	75.0	ab	9.3	bcd	$1,054	gh
20	Gem SC* Super Tin* Badge*	No	7/3, 8/10 7/17, 8/28 7/31	44.9	b	76.9	ab	13.0	b	$1,196	c-f
21	Priaxor* Super Tin* Badge*	No	7/3, 8/10 7/17, 8/28 7/31	45.3	b	78.8	ab	11.8	bc	$1,139	d-g
22	Manzate* (3 applic)	No	7/13, 8/2, 8/23	59.4	a	92.5	a	26.3	a	$1,001	h

Average	22.42	39.07	5.76	$1,204.6
LSD 5%	9.19	17.71	3.92	116.4
CV %	32.6	36.0	54.0	7.7

Means followed by the same letter are not significantly different. Duncans New MRT 5%.

*Fungicides applied at recommended rates and included Masterlock at 6.4 fl oz/A.

****Tank Mix:** Treatment is tank mixed with Manzate Max (1.6 qt/A)

***All treatments were sprayed with a maintenance spray of Badge @ 2pt/A and Masterlock @ 6.4 fl oz/A on 9/18

Net $/A: Assume a $40 beet payment and trial average RWST with fungicide costs subtracted off.

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

Control of Cercospora and Alternaria Leafspot in Sugarbeets with Tank Mix Fungicide Treatments

Laker Agronomy Field, Elkton, MI - 2018

No.	Treatment***	Tank Mix**	Applic Timing	RWSA	RWST	T/A	% Suc
8	Super Tin + Topsin* Badge* Manzate* (no tank mix)	Yes	7/3, 7/27, 8/20 7/17, 8/10 9/4	8593 **a**	**241 a**	**35.6 a**	**16.2 a**
10	Priaxor* Super Tin* Badge* Manzate* (no tank mix)	Yes	7/3, 8/10 7/17, 8/20 7/31 9/4	8102 **ab**	**235 abc**	**34.5 ab**	**15.9 abc**
7	Super Tin* Badge* Manzate* (no tank mix)	Yes	7/3, 7/27, 8/20 7/17, 8/10 9/4	7541 bcd	**237 ab**	31.9 b-e	**15.9 ab**
9	Gem SC* Super Tin* Badge* Manzate* (no tank mix)	Yes	7/3, 8/10 7/17, 8/20 7/31 9/4	7533 bcd	228 b-e	**33.1 a-d**	15.5 bcd
2	Proline + Preference* Super Tin* Badge* Manzate* (no tank mix)	Yes	7/3, 8/14 7/20 8/4 8/30	7355 cde	228 b-e	32.2 b-e	15.5 bcd
18	Super Tin* Badge* Manzate*	No	7/3, 7/27, 8/20 7/17, 8/10 9/4	8087 abc	**234 a-d**	**34.6 ab**	**15.9 ab**
19	Super Tin + Topsin* Badge* Manzate*	No	7/3, 7/27, 8/20 7/17, 8/10 9/4	7470 bcd	223 ef	**33.5 abc**	15.3 def
1	Inspire XT* Super Tin* Badge* Manzate* (no tank mix)	Yes	7/3, 8/4 7/20 8/4 8/30	7553 bcd	227 cde	**33.2 a-d**	15.5 bcd
3	Minerva* Super Tin* Badge* Manzate* (no tank mix)	Yes	7/3, 8/14 7/20 8/4 8/30	7571 bcd	225 c-f	**33.5 abc**	15.3 def
5	Topguard* Super Tin* Badge* Manzate* (no tank mix)	Yes	7/3, 8/14 7/20 8/4 8/30	7268 def	225 def	32.3 b-e	15.3 def
4	Enable + Preference* Super Tin* Badge* Manzate* (no tank mix)	Yes	7/3, 8/14 7/20 8/4 8/30	7027 def	220 efg	32.0 b-e	15.4 cde

Means followed by the same letter are not significantly different. Duncans New MRT 5%.

*Fungicides applied at recommended rates and included Masterlock at 6.4 fl oz/A.

****Tank Mix:** Treatment is tank mixed with Manzate Max (1.6 qt/a)

***All treatments were sprayed with a maintenance spray of Badge @ 2pt/A and Masterlock @ 6.4 fl oz/A on 9/18

Net $/A: Assume a $40 beet payment and trial average RWST with fungicide costs subtracted off.

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

Control of Cercospora and Alternaria Leafspot in Sugarbeets with Tank Mix Fungicide Treatments

Laker Agronomy Field, Elkton, MI - 2018

No.	Treatment***	Tank Mix**	Applic Timing	RWSA	RWST	T/A	% Suc
11	Manzate* (6 applic)	No	7/3, 7/13, 7/23 8/2, 8/13, 8/23	6957 d-g	217 fgh	32.1 b-e	15.0 efg
13	Proline + Preference* Super Tin* Badge* Manzate*	No	7/3, 8/14 7/20 8/4 8/30	7442 bcd	222 ef	**33.6 abc**	15.1 d-g
14	Minerva* Super Tin* Badge* Manzate*	No	7/3, 8/14 7/20 8/4 8/30	6685 efg	217 fgh	30.8 cde	14.8 e-h
12	Inspire XT* Super Tin* Badge* Manzate*	No	7/3, 8/14 7/20 8/4 8/30	6845 d-g	226 c-f	30.2 def	15.3 def
15	Enable + Preference* Super Tin* Badge* Manzate*	No	7/3, 8/14 7/20 8/4 8/30	6535 fg	208 hi	31.4 cde	14.4 hij
16	Topguard* Super Tin* Badge* Manzate*	No	7/3, 8/14 7/20 8/4 8/30	6253 gh	208 hi	29.9 ef	14.8 f-i
20	Gem SC* Super Tin* Badge*	No	7/3, 8/10 7/17, 8/28 7/31	7122 def	223 ef	32.0 b-e	15.2 d-g
21	Priaxor* Super Tin* Badge*	No	7/3, 8/10 7/17, 8/28 7/31	6874 d-g	212 ghi	32.4 b-e	14.7 g-j
22	Manzate* (3 applic)	No	7/13, 8/2, 8/23	5723 h	204 i	28.0 f	14.2 j

Average	7185.0	223.0	32.34	15.26
LSD 5%	635.0	8.3	n.s.	0.47
CV %	7.0	3.0	6.2	2.4

Means followed by the same letter are not significantly different. Duncans New MRT 5%.
*Fungicides applied at recommended rates and included Masterlock at 6.4 fl oz/A.
Tank Mix: Treatment is tank mixed with Manzate Max (1.6 qt/a)
***All treatments were sprayed with a maintenance spray of Badge @ 2pt/A and Masterlock @ 6.4 fl oz/A on 9/18

Comments: Leafspot (*Cercospora beticola* and *Alternaria alternata*) pressure was very high and consisted of equal amounts of Cercospora and Alternaria leafspot. Tank mixing fungicides with Manzate MAX improved leafspot control significantly. Super Tin treatments provided the best leafspot control. The addition of Topsin to Super Tin improved disease control. Priaxor and Gem (strobilurin fungicides) provided better leafspot control than triazoles did.

Net $/A: Assume a $40 beet payment and trial average RWST with fungicide costs subtracted off.
Bold: Results are not statistically different from top-ranking treatment in each column.

Control of Cercospora and Alternaria Leafspot in Sugarbeets with Tank Mix Fungicide Treatments

Wackerle, Pinconning, MI - 2018

Trial Quality: Fair-Good
Variety: C-G333NT
Planted: May 14
Harvested: Sept 19
Plots: 6 rows X 38 ft, 5 reps
Row Spacing: 22 inches

Soil Info: Sandy Loam
% OM: 5.3 **pH:** 7.1 **CEC:** 15.9
P: above opt **K:** above opt
Mn: med **B:** med
Added N: 130-135 lbs
Prev Crop: Wheat

Rhizoc Level: Low
Cerc Control: See Trts.
Problems: none
Seeding Rate: 4.1 inches
Rainfall: 11.6 inches
Beets/100 ft: ~230

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

No.	Treatment***	Tank Mix**	Applic Timing	% Leafspot Damage						Net $/A	
				Avg 2		17-Sep		5-Sep			
8	Super Tin + Topsin* Badge* Badge* (no tank mix)	Yes	6/25, 7/18, 8/13 7/9, 8/3 8/30	**1.0**	**g**	**1.2**	**g**	**0.1**	**h**	**$971**	**abc**
7	Super Tin* Badge* Badge* (no tank mix)	Yes	6/25, 7/20, 8/13 7/9, 8/3 8/30	**1.1**	**g**	**1.8**	**fg**	**0.4**	**h**	**$1,006**	**a**
19	Super Tin + Topsin* Badge*	No	6/25, 7/20, 8/13 7/9, 8/3, 8/30	**1.3**	**g**	**1.6**	**g**	**0.9**	**h**	**$919**	**a-e**
9	Gem SC* Super Tin* Badge* Badge* (no tank mix)	Yes	6/25, 8/2 7/9, 8/16 7/23, 8/30 8/30	**2.2**	**fg**	**3.0**	**fg**	**1.4**	**h**	$797	d-h
10	Priaxor* Super Tin* Badge* Badge* (no tank mix)	Yes	6/25, 8/2 7/9, 8/16 7/23 8/30	**3.0**	**fg**	**4.1**	**efg**	**2.0**	**gh**	$740	ghi
11	Manzate* (6 applic)	No	6/25, 7/5, 7/20, 7/28, 8/9, 8/20	**3.1**	**fg**	**4.8**	**efg**	**1.3**	**h**	**$916**	**a-e**
20	Gem SC* Super Tin* Badge*	No	6/25, 8/2 7/9, 8/16 7/23, 8/30	**4.6**	**efg**	**4.7**	**efg**	**4.6**	**fgh**	$828	d-g
2	Proline + Preference* Super Tin* Badge* Badge* (no tank mix)	Yes	6/25, 8/9 7/13 7/26 8/30	**4.7**	**efg**	**5.0**	**efg**	**4.5**	**fgh**	**$899**	**a-f**
18	Super Tin* Badge*	No	6/25, 7/20, 8/13 7/9, 8/3, 8/30	**5.4**	**efg**	**6.2**	**efg**	**4.7**	**fgh**	$863	b-g
3	Minerva* Super Tin* Badge* Badge* (no tank mix)	Yes	6/25, 8/9 7/13 7/26 8/30	**5.9**	**efg**	**7.8**	**efg**	**4.1**	**fgh**	**$929**	**a-d**
5	Topguard* Super Tin* Badge* Badge* (no tank mix)	Yes	6/25, 8/9 7/13 7/26 8/30	**7.1**	**efg**	**9.0**	**efg**	**5.2**	**e-h**	$852	b-g

Means followed by the same letter are not significantly different. Duncans New MRT 5%.

*Fungicides applied at recommended rates and included Masterlock at 6.4 fl oz/A.

****Tank Mix:** Treatment is tank mixed with Manzate Max (1.6 qt/a)

***All treatments were sprayed with a maintenance spray of Badge @ 2pt/A and Masterlock @ 6.4 fl oz/A on 9/18

Net $/A: Assume a $40 beet payment and trial average RWST with fungicide costs subtracted off.

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

Control of Cercospora and Alternaria Leafspot in Sugarbeets with Tank Mix Fungicide Treatments

Wackerle, Pinconning, MI - 2018

No.	Treatment***	Tank Mix**	Applic Timing	% Leafspot Damage						Net $/A	
				Avg 2		17-Sep		5-Sep			
1	Inspire XT* Super Tin* Badge* Badge* (no tank mix)	Yes	6/25, 8/9 7/13 7/26 8/30	8.3	def	**9.0**	**efg**	7.7	c-f	$846	b-g
4	Enable + Preference* Super Tin* Badge* Badge* (no tank mix)	Yes	6/25, 8/9 7/13 7/26 8/30	9.9	cde	12.2	def	7.6	c-f	$745	ghi
21	Priaxor* Super Tin* Badge*	No	6/25, 8/2 7/9, 8/16 7/23, 8/30	10.2	cde	13.6	de	6.8	d-g	$682	hi
14	Minerva* Super Tin* Badge*	No	6/25, 8/9 7/13 7/26, 8/30	14.5	bcd	18.8	cd	10.2	b-e	$786	e-h
15	Enable + Preference* Super Tin* Badge*	No	6/25, 8/9 7/13 7/26, 8/30	16.5	b	24.2	bc	8.8	c-f	**$893**	**a-f**
13	Proline + Preference* Super Tin* Badge*	No	6/25, 8/9 7/13 7/26, 8/30	17.2	b	20.4	bcd	14.0	b	$765	f-i
12	Inspire XT* Super Tin* Badge*	No	6/25, 8/9 7/13 7/26, 8/30	18.1	b	25.2	bc	11.1	bcd	$767	f- i
16	Topguard* Super Tin* Badge*	No	6/25, 8/9 7/13 7/26, 8/30	20.7	b	28.8	b	12.6	bc	$797	d-h
22	Manzate* (3 applic)	No	7/5, 7/28, 8/20	68.9	a	84.2	a	53.6	a	$636	i

Average	11.19	14.28	8.08	$831.9
LSD 5%	5.67	8.79	4.42	117.1
CV %	40.4	49.1	43.5	11.1

Means followed by the same letter are not significantly different. Duncans New MRT 5%.

*Fungicides applied at recommended rates and included Masterlock at 6.4 fl oz/A.

****Tank Mix:** Treatment is tank mixed with Manzate Max (1.6 qt/a)

***All treatments were sprayed with a maintenance spray of Badge @ 2pt/A and Masterlock @ 6.4 fl oz/A on 9/18

Net $/A: Assume a $40 beet payment and trial average RWST with fungicide costs subtracted off.

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

Control of Cercospora and Alternaria Leafspot in Sugarbeets with Tank Mix Fungicide Treatments

Wackerle, Pinconning, MI - 2018

No.	Treatment***	Tank Mix**	Applic Timing	RWSA	RWST	T/A	% Suc	% CJP
8	Super Tin + Topsin* Badge* Badge* (no tank mix)	Yes	6/25, 7/18, 8/13 7/9, 8/3 8/30	**5229 ab**	**196 a**	**26.7 ab**	**13.8 a**	**93.9 abc**
7	Super Tin* Badge* Badge* (no tank mix)	Yes	6/25, 7/20, 8/13 7/9, 8/3 8/30	5350 **a**	**198 a**	**27.0 ab**	**14.0 a**	93.7 bcd
19	Super Tin + Topsin* Badge*	No	6/25, 7/20, 8/13 7/9, 8/3, 8/30	**4782 a-e**	**196 a**	24.3 b-e	**13.9 a**	93.6 bcd
9	Gem SC* Super Tin* Badge* Badge* (no tank mix)	Yes	6/25, 8/2 7/9, 8/16 7/23, 8/30 8/30	4516 c-f	**192 abc**	23.6 c-f	**13.7 abc**	93.5 cd
10	Priaxor* Super Tin* Badge* Badge* (no tank mix)	Yes	6/25, 8/2 7/9, 8/16 7/23 8/30	4296 d-g	**198 a**	21.7 efg	**13.9 a**	**94.3 a**
11	Manzate* (6 applic)	Yes	6/25, 7/5, 7/20, 7/28, 8/9, 8/20	4648 b-f	**199 a**	23.3 def	**14.0 a**	**94.0 abc**
20	Gem SC* Super Tin* Badge*	No	6/25, 8/2 7/9, 8/16 7/23, 8/30	4400 c-g	**194 ab**	22.7 def	**13.7 abc**	**93.9 abc**
2	Proline + Preference* Super Tin* Badge* Badge* (no tank mix)	Yes	6/25, 8/9 7/13 7/26 8/30	**4857 a-d**	**198 a**	**24.5 a-e**	**14.1 a**	93.6 bcd
18	Super Tin* Badge*	No	6/25, 7/20, 8/13 7/9, 8/3, 8/30	4461 c-f	**194 ab**	23.0 def	**13.7 ab**	93.8 bcd
3	Minerva* Super Tin* Badge* Badge* (no tank mix)	Yes	6/25, 8/9 7/13 7/26 8/30	**4977 abc**	**195 ab**	**25.5 a-d**	**13.8 ab**	93.8 bc
5	Topguard* Super Tin* Badge* Badge* (no tank mix)	Yes	6/25, 8/9 7/13 7/26 8/30	4618 b-f	**193 ab**	23.9 cde	**13.7 abc**	93.7 bcd

Means followed by the same letter are not significantly different. Duncans New MRT 5%.

*Fungicides applied at recommended rates and included Masterlock at 6.4 fl oz/A.

****Tank Mix:** Treatment is tank mixed with Manzate Max (1.6 qt/a)

***All treatments were sprayed with a maintenance spray of Badge @ 2pt/A and Masterlock @ 6.4 fl oz/A on 9/18

Net $/A: Assume a $40 beet payment and trial average RWST with fungicide costs subtracted off.

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

Control of Cercospora and Alternaria Leafspot in Sugarbeets with Tank Mix Fungicide Treatments

Wackerle, Pinconning, MI - 2018

No.	Treatment***	Tank Mix**	Applic Timing	RWSA	RWST	T/A	% Suc	% CJP
1	Inspire XT* Super Tin* Badge* Badge* (no tank mix)	Yes	6/25, 8/9 7/13 7/26 8/30	4576 b-f	**194 ab**	23.6 c-f	**13.7 abc**	**93.9 abc**
4	Enable + Preference* Super Tin* Badge* Badge* (no tank mix)	Yes	6/25, 8/9 7/13 7/26 8/30	4088 fg	**194 ab**	21.0 fg	**13.7 ab**	**94.0 abc**
21	Priaxor* Super Tin* Badge*	No	6/25, 8/2 7/9, 8/16 7/23, 8/30	3755 gh	**191 abc**	19.6 gh	**13.7 abc**	93.5 cd
14	Minerva* Super Tin* Badge*	No	6/25, 8/9 7/13 7/26, 8/30	4114 efg	182 c	22.5 ef	13.1 c	93.5 cd
15	Enable + Preference* Super Tin* Badge*	No	6/25, 8/9 7/13 7/26, 8/30	4630 b-f	**198 a**	23.3 def	**14.0 a**	**94.0 abc**
13	Proline + Preference* Super Tin* Badge*	No	6/25, 8/9 7/13 7/26, 8/30	4071 fg	185 bc	21.9 efg	13.2 bc	93.7 bcd
12	Inspire XT* Super Tin* Badge*	No	6/25, 8/9 7/13 7/26, 8/30	4030 fg	185 bc	21.7 efg	13.2 bc	93.7 bcd
16	Topguard* Super Tin* Badge*	No	6/25, 8/9 7/13 7/26, 8/30	4184 d-g	**190 abc**	22.0 efg	**13.5 abc**	93.7 bcd
22	Manzate* (3 applic)	No	7/5, 7/28, 8/20	3200 h	173 d	18.4 h	12.5 d	93.3 d

Average	4439.1	192.3	23.01	13.65	93.76
LSD 5%	563.3	8.7	2.36	0.53	0.41
CV %	10.0	3.6	8.1	3.1	0.4

Means followed by the same letter are not significantly different. Duncans New MRT 5%.
*Fungicides applied at recommended rates and included Masterlock at 6.4 fl oz/A.
Tank Mix: Treatment is tank mixed with Manzate Max (1.6 qt/a)
***All treatments were sprayed with a maintenance spray of Badge @ 2pt/A and Masterlock @ 6.4 fl oz/A on 9/18

Comments: Leafspot (*Cercospora beticola* and *Alternaria alternata*) pressure was high and consisted of equal amounts of Cercospora and Alternaria leafspot. Tank mixing fungicides with Manzate Max improved leafspot control significantly. Super Tin treatments provided the best leafspot control. The addition of Topsin to Super Tin improved disease control. Priaxor and Gem (strobilurin fungicides) provided better leafspot control than did triazoles.

Net $/A: Assume a $40 beet payment and trial average RWST with fungicide costs subtracted off.
Bold: Results are not statistically different from top-ranking treatment in each column.

PIONEER · BIG CHIEF
MICHIGAN SUGAR

Control of Cercospora and Alternaria Leafspot Utilizing Fungicides Approved for use in Canada

Laker Agronomy Field, Elkton, MI - 2018

Trial Quality: Good
Variety: C-G333NT
Planted: May 2
Harvested: Oct 18
Plots: 6 rows X 38 ft, 4 reps
Row Spacing: 22 inches

Soil Info: Clay Loam
% OM: 2.5 **pH:** 6.9 **CEC:** 14.6
P: above opt **K:** above opt
Mn: high **B:** low
Added N: 135 lbs
Prev Crop: Soybeans

Rhizoc Level: Low
Cerc Control: See trts.
Problems: None
Seeding Rate: 4.1 inches
Rainfall: 21.5 inches
Beets/100 ft: ~165

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

No.	Treatment	Rate/A	Applic Timing	% Leafspot Damage		Net $/A	RWSA	RWST	T/A	% SUC
				21-Sep	7-Sep					
2	Proline + **NIS**** (1 application)	168.6 ml + 0.125 %	28-Jun	**32.0 h**	**1.9 gh**	**$1,239 ab**	**7346 a**	**224 a**	**32.8 a**	**15.3 a**
	Manzate Pro Stick + Masterlock (3 applications)	189.3 ml + 189.3 ml	16-Jul 10-Aug 5-Sep							
	Proline + **NIS** + Masterlock** (2 applications)	168.6 ml + 0.125 % + 189.3 ml	25-Jul 20-Aug							
10	Manzate Pro Stick (1 application)	907.2 g	28-Jun	**41.5 gh**	**1.6 h**	**$1,284 a**	**7273 a**	**223 a**	**32.5 a**	**15.2 a**
	Manzate Pro Stick + Masterlock (6 applications)	189.3 ml	9-Jul 19-Jul 30-Jul 10-Aug 20-Aug 30-Aug							
8	Topsin** (1 application)	591.5 ml	28-Jun	51.5 fg	**3.0 fgh**	**$1,261 ab**	**7146 ab**	**221 a**	**32.4 a**	**15.1 ab**
	Manzate Pro Stick + Masterlock (3 applications)	189.3 ml	12-Jul 20-Aug 30-Aug							
	Topsin + Masterlock** (1 application)	591.5 ml + 189.3 ml	6-Aug							
1	Inspire XT** (1 application)	207 ml	28-Jun	52.0 fg	**2.2 fgh**	**$1,195 abc**	**7017 abc**	**220 a**	**31.9 a**	**15.1 ab**
	Manzate Pro Stick + Masterlock (3 applications)	189.3 ml	16-Jul 10-Aug 5-Sep							
	Inspire XT + Masterlock** (2 applications)	207 ml + 189.3 ml	25-Jul 20-Aug							

Means followed by the same letter are not significantly different. Duncans New MRT 5%.

****Treatments sprayed with Manzate Pro Stick @ 2 lb = 907.2 grams**
NIS: Preference

*All treatments were sprayed with a maintenance spray of Badge @ 2 pt/A and Masterlock @ 6.4 fl oz/A on 9/18.

Net $/A: Assume a $40 beet payment and trial average RWST with fungicide costs subtracted off.

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

PIONEER · BIG CHIEF
MICHIGAN SUGAR

Control of Cercospora and Alternaria Leafspot Utilizing Fungicides Approved for use in Canada

Laker Agronomy Field, Elkton, MI - 2018

No.	Treatment	Rate/A	Applic Timing	% Leafspot Damage		Net $/A	RWSA	RWST	T/A	% SUC
				21-Sep	7-Sep					
4	Caramba** (1 application)	508.7 ml	28-Jun	59.5 ef	**3.6 e-h**	**$1,179 a-d**	**6805 a-d**	**215 ab**	**31.7 a**	**14.8 abc**
	Manzate Pro Stick + Masterlock (2 applications)	189.3 ml	12-Jul 20-Aug							
	Caramba + Masterlock** (2 applications)	508.7 ml + 189.3 ml	6-Aug 30-Aug							
3	Minerva** (1 application)	384.5 ml	28-Jun	60.0 ef	4.4 def	**$1,233 abc**	**7214 ab**	**222 a**	**32.5 a**	**15.2 a**
	Manzate Pro Stick + Masterlock (3 applications)	189.3 ml	16-Jul 10-Aug 5-Sep							
	Minerva + Masterlock** (2 applications)	384.5 ml + 189.3 ml	25-Jul 20-Aug							
6	Priaxor** (1 application)	180.4 ml	28-Jun	65.0 def	7.5 c	**$1,191 abc**	**6923 abc**	**218 ab**	**31.8 a**	**14.9 abc**
	Manzate Pro Stick + Masterlock (3 applications)	189.3 ml	12-Jul 20-Aug 30-Aug							
	Priaxor + Masterlock** (1 application)	180.4 ml + 189.3 ml	6-Aug							
5	Tilt** (1 application)	201.1 ml	28-Jun	66.5 c-f	6.0 cd	**$1,206 abc**	**6804 a-d**	**215 ab**	**31.6 a**	**14.9 abc**
	Manzate Pro Stick + Masterlock (3 applications)	189.3 ml	12-Jul 20-Aug 30-Aug							
	Tilt + Masterlock** (1 application)	201.1 ml + 189.3 ml	6-Aug							

Means followed by the same letter are not significantly different. Duncans New MRT 5%.

****Treatments sprayed with Manzate Pro Stick @ 907.2 grams**

*All treatments were sprayed with a maintenance spray of Badge @ 2 pt/A and Masterlock @ 6.4 fl oz/A on 9/18.

Net $/A: Assume a $40 beet payment and trial average RWST with fungicide costs subtracted off.

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

Control of Cercospora and Alternaria Leafspot Utilizing Fungicides Approved for use in Canada

Laker Agronomy Field, Elkton, MI - 2018

No.	Treatment	Rate/A	Applic Timing	% Leafspot Damage		Net $/A	RWSA	RWST	T/A	% SUC
				21-Sep	7-Sep					
16	Topsin** (1 application)	591.5 ml	28-Jun	68.8 cde	4.0 d-g	**$1,199 abc**	**6813 a-d**	**218 ab**	**31.2 a**	**15.0 abc**
	Manzate Pro Stick + Masterlock (3 applications)	189.3 ml	12-Jul 20-Aug 30-Aug							
	Topsin + Masterlock (1 application)	591.5 ml + 189.3 ml	6-Aug							
15	Inspire (not XT) + Topsin (1 application)	207 ml + 591.5 ml	28-Jun	71.3 cde	5.8 cde	**$1,158 a-d**	**6823 a-d**	**216 ab**	**31.6 a**	**14.8 abc**
	Manzate Pro Stick + Masterlock (3 applications)	189.3 ml	16-Jul 10-Aug 5-Sep							
	Inspire (not XT) + Topsin Masterlock (2 applications)	207 ml + 591.5 ml + 189.3 ml	25-Jul 20-Aug							
11	Badge (1 application)	950 ml	28-Jun	75.5 b-e	8.0 c	$1,120 bcd	6465 bcd	**213 ab**	**30.5 a**	**14.7 abc**
	Badge + Masterlock (5 applications)	950 ml + 189.3 ml	9-Jul 19-Jul 30-Jul 10-Aug 20-Aug							
	Manzate Pro Stick + Masterlock (1 application)	189.3 ml	30-Aug							
9	Inspire (not XT)** (1 application)	207 ml	28-Jun	75.5 b-e	**3.8 d-h**	**$1,206 abc**	**7042 abc**	**220 a**	**32.1 a**	**15.0 abc**
	Manzate Pro Stick + Masterlock (3 applications)	189.3 ml	16-Jul 10-Aug 5-Sep							
	Inspire (not XT) + Masterlock** (2 applications)	207 ml + 189.3 ml	25-Jul 20-Aug							

Means followed by the same letter are not significantly different. Duncans New MRT 5%.

****Treatments sprayed with Manzate Pro Stick @ 907.2 grams**

*All treatments were sprayed with a maintenance spray of Badge @ 2 pt/A and Masterlock @ 6.4 fl oz/A on 9/18.

Net $/A: Assume a $40 beet payment and trial average RWST with fungicide costs subtracted off.

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

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Control of Cercospora and Alternaria Leafspot Utilizing Fungicides Approved for use in Canada

Laker Agronomy Field, Elkton, MI - 2018

No.	Treatment	Rate/A	Applic Timing	% Leafspot Damage		Net $/A	RWSA	RWST	T/A	% SUC
				21-Sep	7-Sep					
7	Headline SC** (1 application)	363.8 ml	28-Jun	78.0 a-d	8.0 c	$1,122 bcd	**6613 a-d**	**214 ab**	**30.9 a**	**14.8 abc**
	Mazate Pro Stick + Masterlock (3 applications)	189.3 ml	12-Jul 20-Aug 30-Aug							
	Headline SC + Masterlock** (1 application)	236.8 ml + 189.3 ml	6-Aug							
13	Cueva (1 application)	5.7 L	28-Jun	82.5 abc	12.9 b	$1,043 d	6126 d	205 b	**29.9 a**	14.3 c
	Cueva + Masterlock (5 applications)	5.7 L + 189.3 ml	9-Jul 19-Jul 30-Jul 10-Aug 20-Aug							
	Manzate Pro Stick + Masterlock (1 application)	5.7 L + 189.3 ml	30-Aug							
12	Cueva (1 application)	2.8 L	28-Jun	88.5 ab	12.7 b	$1,090 cd	6326 cd	**210 ab**	**30.0 a**	14.4 bc
	Cueva + Masterlock (5 applications)	2.8 L + 189.3 ml	9-Jul 19-Jul 30-Jul 10-Aug 20-Aug							
	Manzate Pro Stick + Masterlock (1 application)	2.8 L + 189.3 ml	30-Aug							
14	Untreated			93.0 a	21.3 a	$875 e	4712 e	191 c	24.7 b	13.4 d
	Average			66.31	6.67	$1,162.7	6715.5	215.3	31.12	14.80
	LSD 5%			14.52	2.09	124.2	668.6	11.6	2.68	0.60
	CV %			17.3	24.8	8.4	7.9	4.3	6.8	3.2

Means followed by the same letter are not significantly different. Duncans New MRT 5%.

****Treatments sprayed with Manzate Pro Stick @ 907.2 grams**

*All treatments were sprayed with a maintenance spray of Badge @ 2 pt/A and Masterlock @ 6.4 fl oz/A on 9/18.

Comments: Cercospora (*Cercospora beticola*) and Alternaria (*Alternaria alternata*) leafspot pressure was very high. The Untreated plots lost over 6 tons/acre and 2 points of sugar. None of the treatments provided adequate disease control. One or two more applications should have been applied. All of the main fungicides (Inspire XT, Topsin, etc,) were tank mixed with Manzate Prostick. Manzate Prostick + Masterlock (7 applic) gave better leafspot control than most treatments.

***Net $/A:** Assume a $40 beet payment and trial average RWST with fungicide costs subtracted off.

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

Control of *Cercospora beticola* and *Alternaria Alternata* Leafspot in Sugarbeets with Several Fungicide Programs
Laker Agronomy Field, Elkton, MI - 2018

Trial Quality: Good
Variety: C-G333NT
Planted: May 2
Harvested: Oct 18
Plots: 6 rows X 38 ft, 4 reps
Row Spacing: 22 inches

Soil Info: Clay Loam
% OM: 2.5 **pH:** 6.9 **CEC:** 14.6
P: above opt **K:** above opt
Mn: high **B:** low
Added N: 135 lbs.
Prev Crop: Wheat

Rhizoc Level: Low
Cerc Control: See trts.
Problems: None
Seeding Rate: 4.1 inches
Rainfall: 21.6 inches
Beets/100 ft: ~185

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

No.	Treatment***	Rate / A	Applic Timing	% Leafspot Damage 21-Sep	Net $/A	RWSA	RWST	T/A	% SUC
3	Manzate* (1 application)	1.6 qt	28-Jun	**2.0 e**	**$1,089 a**	**7183 a**	233 cd	**30.8 a**	15.7 bc
	Super Tin + Manzate* (2 applications)	8 fl oz + 1.6 qt	3-Jul 4-Aug						
	Inspire XT + Manzate* (1 application)	7 fl oz + 1.6 qt	17-Jul						
	Proline + NIS** + Manzate* (1 application)	5.7 fl oz + 1.6 qt	18-Aug						
	Badge* (1 application)	2 pt	30-Aug						
1	Manzate* (1 application)	1.6 qt	28-Jun	**4.5 e**	$929 de	6251 cd	236 bcd	26.5 bc	15.9 bc
	Inspire XT + Manzate* (1 application)	7 fl oz + 1.6 qt	3-Jul						
	Super Tin + Manzate* (2 applications)	8 fl oz + 1.6 qt	20-Jul 23-Aug						
	Proline + NIS** + Manzate* (1 application)	5.7 fl oz + 1.6 qt	4-Aug						
	Badge* (1 application)	2 pt	5-Sep						
4	Super Tin + Topsin + Manzate* (1 application)	8 fl oz + 20 fl oz + 1.6 qt	3-Jul	**5.6 de**	$1,001 bcd	6649 bc	238 bc	28.0 b	16.0 bc
	Inspire XT + Manzate* (1 application)	7 fl oz + 1.6 qt	17-Jul						
	Super Tin + Manzate* (1 application)	8 fl oz + 1.6 qt	4-Aug						
	Proline + NIS** + Manzate* (1 application)	5.7 fl oz + 1.6 qt	18-Aug						
	Badge* (1 application)	2 pt	5-Sep						

*Treatments sprayed with Masterlock (6.4 fl oz)

****NIS:** Preference (0.125%)

***All treatments were sprayed with a maintenance spray of Badge @ 2 pt/A and Masterlock @ 6.4 fl oz/A on 9/18.

Means followed by the same letter are not significantly different. Duncans New MRT 5%.

Net $/A: Assume a $40 beet payment and trial average RWST with fungicide costs subtracted off.

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

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Control of *Cercospora beticola* and *Alternaria Alternata* Leafspot in Sugarbeets with Several Fungicide Programs
Laker Agronomy Field, Elkton, MI - 2018

No.	Treatment***	Rate / A	Applic Timing	% Leafspot Damage 21-Sep	Net $/A	RWSA	RWST	T/A	% SUC
7	Manzate* (1 application)	1.6 qt	28-Jun	**6.3 de**	$924 de	6397 cd	240 bc	26.7 bc	**16.1 abc**
	Priaxor + Manzate* (2 applications)	8 fl oz + 1.6 qt	3-Jul 31-Jul						
	Super Tin + Manzate* (1 application)	8 fl oz + 1.6 qt	17-Jul						
	Inspire XT + Manzate* (1 application)	7 fl oz + 1.6 qt	14-Aug						
	Badge* (1 application)	2 pt	30-Aug						
2	Inspire XT + Manzate* (1 application)	7 fl oz + 1.6 qt	3-Jul	**6.3 de**	$964 b-e	6377 cd	**242 abc**	26.4 bc	**16.2 ab**
	Super Tin + Manzate* (2 applications)	8 fl oz + 1.6 qt	20-Jul 23-Aug						
	Proline + NIS** + Manzate* (1 application)	5.7 fl oz + 1.6 qt	4-Aug						
	Badge* (1 application)	2 pt	5-Sep						
10	Echo + Manzate* (1 application)	2 pt + 1.6 qt	3-Jul	**7.5 de**	$957 cde	6441 cd	236 bcd	27.3 bc	15.8 bc
	Priaxor + Manzate* (1 application)	8 fl oz + 1.6 qt	17-Jul						
	Super Tin + Topsin (1 application)	8 fl oz + 20 fl oz	31-Jul						
	Inspire XT + Manzate* (1 application)	7 fl oz + 1.6 qt	14-Aug						
	Badge* (1 application)	2 pt	30-Aug						

*Treatments sprayed with Masterlock (6.4 fl oz)

****NIS:** Preference (0.125%)

***All treatments were sprayed with a maintenance spray of Badge @ 2 pt/A and Masterlock @ 6.4 fl oz/A on 9/18.

Means followed by the same letter are not significantly different. Duncans New MRT 5%.

Net $/A: Assume a $40 beet payment and trial average RWST with fungicide costs subtracted off.

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

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Control of *Cercospora beticola* and *Alternaria Alternata* Leafspot in Sugarbeets with Several Fungicide Programs

Laker Agronomy Field, Elkton, MI - 2018

No.	Treatment***	Rate / A	Applic Timing	% Leafspot Damage 21-Sep	Net $/A	RWSA	RWST	T/A	% SUC
9	Manzate* (1 application)	1.6 qt	28-Jun	**8.5 de**	**$1,038 ab**	**6983 ab**	**252 a**	27.7 b	**16.8 a**
	Echo + Manzate* (1 application)	2 pt + 1.6 qt	3-Jul						
	Priaxor + Manzate* (1 application)	8 fl oz + 1.6 qt	17-Jul						
	Super Tin + Topsin (1 application)	8 fl oz + 20 fl oz	31-Jul						
	Inspire XT + Manzate* (1 application)	7 fl oz + 1.6 qt	14-Aug						
	Badge* (1 application)	2 pt	30-Aug						
5	Manzate* (1 application)	1.6 qt	28-Jun	**10.5 cde**	$964 b-e	6608 bc	**242 abc**	27.3 bc	**16.3 ab**
	Priaxor + Manzate* (1 application)	8 fl oz + 1.6 qt	3-Jul						
	Inspire XT + Manzate* (1 application)	7 fl oz + 1.6 qt	17-Jul						
	Manzate + Badge* (1 application)	1.6 qt + 2 pt	4-Aug						
	Proline + NIS** + Manzate* (1 application)	5.7 fl oz + 1.6 qt	14-Aug						
	Badge* (1 application)	2 pt	30-Aug						
11	Manzate (4 applications)	1.6 qt	28-Jun 3-Jul 13-Jul 23-Jul	13.9 cd	$1,013 bc	6549 bcd	237 bc	27.6 bc	15.9 bc
	Manzate + Badge (2 applications)	1.6 qt + 2 pt	2-Aug						
	Badge* (1 application)	2 pt	13-Aug						
	Badge (2 application)	2 pt	23-Aug 4-Sep						

*Treatments sprayed with Masterlock (6.4 fl oz)

****NIS:** Preference (0.125%)

***All treatments were sprayed with a maintenance spray of Badge @ 2 pt/A and Masterlock @ 6.4 fl oz/A on 9/18.

Means followed by the same letter are not significantly different. Duncans New MRT 5%.

Net $/A: Assume a $40 beet payment and trial average RWST with fungicide costs subtracted off.

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

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Control of *Cercospora beticola* and *Alternaria Alternata* Leafspot in Sugarbeets with Several Fungicide Programs

Laker Agronomy Field, Elkton, MI - 2018

No.	Treatment***	Rate / A	Applic Timing	% Leafspot Damage 21-Sep	Net $/A	RWSA	RWST	T/A	% SUC
8	Priaxor + Manzate* (2 applications)	8 fl oz + 1.6 qt	3-Jul 31-Jul	18.1 c	$913 e	6270 cd	**246 ab**	25.5 c	**16.4 ab**
	Super Tin + Manzate* (1 application)	8 fl oz + 1.6 qt	17-Jul						
	Inspire XT + Manzate* (1 application)	7 fl oz + 1.6 qt	14-Aug						
	Badge* (1 application)	2 pt	30-Aug						
6	Priaxor + Manzate* (1 application)	8 fl oz + 1.6 qt	3-Jul	32.5 b	$892 e	6118 d	236 bcd	25.9 bc	15.8 bc
	Inspire XT + Manzate* (1 application)	7 fl oz + 1.6 qt	17-Jul						
	Manzate + Badge* (1 application)	1.6 qt + 2 pt	4-Aug						
	Proline + NIS** + Manzate* (1 application)	5.7 fl oz + 1.6 qt	14-Aug						
	Badge* (1 application)	2 pt	30-Aug						
12	Untreated			94.4 a	758 f	4523 e	225 d	20.1 d	15.3 c
	Average			17.50	$953.5	6362.5	238.6	26.65	16.02
	LSD 5%			7.88	71.1	424.2	10.9	1.80	0.67
	CV %			31.3	5.2	4.6	3.2	4.7	2.9

*Treatments sprayed with Masterlock (6.4 fl oz)

****NIS:** Preference (0.125%)

***All treatments were sprayed with a maintenance spray of Badge @ 2 pt/A and Masterlock @ 6.4 fl oz/A on 9/18.

Means followed by the same letter are not significantly different. Duncans New MRT 5%.

Comments: Leafspot (*Cercospora beticola* and *Alternaria alternata*) pressure was very high and consisted of 50% Cercospora and 50% Alternaria leafspot. Starting early (Jun 28) followed by a Triazole + EBDC / Super Tin + EBDC program gave the best overall results. Priaxor based treatments were slightly less effective than triazole based treatments. Starting early and including Super Tin in the program improved results.

Net $/A: Assume a $40 beet payment and trial average RWST with fungicide costs subtracted off.

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

Evaluate Protectant Fungicides for Control of *Cercospora beticola* and *Alternaria alternata* leafspot in Sugarbeets

Laker Agronomy Field, Elkton, MI - 2018

Trial Quality: Good
Variety: C-G333NT
Planted: May 2
Harvested: Oct 18
Plots: 6 rows X 38 ft, 4 reps
Row Spacing: 22 inches

Soil Info: Clay Loam
% OM: 2.7 **pH:** 6.3 **CEC:** 16.3
P: above opt **K:** above opt
Mn: high **B:** low
Added N: 135 lbs.
Prev Crop: Soybeans

Rhizoc Level: Low
Cerc Control: See trts.
Problems: None
Seeding Rate: 4.1 inches
Rainfall: 21.6 inches
Beets/100 ft: ~165

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

No.	Treatment	Rate/A	Applic Timing	% Leafspot Damage 21-Sep	% Leafspot Damage 7-Sep	Net $/A	RWSA	RWST	T/A	% SUC
7	Echo* (5 applications)	3 pt	28-Jun 13-Jul 27-Jul 10-Aug 28-Aug	**4.5 f**	**0.9 j**	**$1,422 ab**	**8549 ab**	**234 abc**	**36.5 a**	**15.7 abc**
21	Super Tin + Topsin Manzate* (2 applications)	8 fl oz + 20 fl oz + 1.6 fl	28-Jun 23-Jul	**5.0 f**	**0.5 j**	**$1,438 a**	**8679 a**	**242 a**	**35.9 abc**	**16.2 a**
	Manzate + Na Bicarb* (3 applications)	1.6 qt + 5 lb	13-Jul 7-Aug 18-Aug							
	Badge* (1 application)	2 pt	30-Aug							
9	Super Tin + Topsin + Manzate* (2 applications)	8 fl oz + 20 fl oz + 1.6 qt	28-Jun 23-Jul	**5.3 f**	**0.7 j**	$1,346 bc	8137 bc	**237 ab**	34.3 bcd	**16.0 abc**
	Manzate* (3 applications)	1.6 qt	13-Jul 7-Aug 18-Aug							
	Badge* (1 application)	2 pt	30-Aug							
12	Echo + Manzate* (2 applications)	2 pt + 1.6 qt	28-Jun 23-Jul	**8.1 f**	**1.5 j**	**$1,388 ab**	**8411 ab**	**238 ab**	**35.3 a-d**	**16.0 ab**
	Manzate* (2 applications)	1.6 qt	13-Jul 7-Aug							
	Inspire XT + Manzate* (1 application)	7 fl oz + 1.6 qt	18-Aug							
	Badge* (1 application)	2 pt	30-Aug							
8	Super Tin + Manzate* (2 applications)	8 fl oz + 1.6 qt	28-Jun 23-Jul	**8.1 f**	**0.4 j**	**$1,440 a**	**8561 ab**	**238 ab**	**36.0 ab**	**15.9 abc**
	Manzate* (3 applications)	1.6 qt	13-Jul 7-Aug 18-Aug							
	Badge* (1 application)	2 pt	30-Aug							

*Treatments sprayed with Masterlock (6.4 fl oz)

Na Bicarb: Sodium Bicarbonate

Means followed by the same letter are not significantly different. Duncans New MRT 5%.

Net $/A: Assume a $40 beet payment and trial average RWST with fungicide costs subtracted off.

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

Evaluate Protectant Fungicides for Control of *Cercospora beticola* and *Alternaria alternata* leafspot in Sugarbeets

Laker Agronomy Field, Elkton, MI - 2018

No.	Treatment	Rate/A	Applic Timing	% Leafspot Damage 21-Sep	% Leafspot Damage 7-Sep	Net $/A	RWSA	RWST	T/A	% SUC
20	Super Tin + Manzate* (2 applications)	8 fl oz + 1.6 qt	28-Jun 23-Jul	**9.5 f**	**0.4 j**	**$1,356 abc**	8110 bc	**236 ab**	34.3 bcd	**15.8 abc**
	Manzate + Sodium Bicarbonate* (3 applications)	1.6 qt + 5 lb	13-Jul 7-Aug 18-Aug							
	Badge* (1 application)	2 pt	30-Aug							
6	Echo* (5 applications)	2 pt	28-Jun 13-Jul 27-Jul 10-Aug 28-Aug	**16.0 f**	**3.9 hij**	**$1,402 ab**	**8294 ab**	**232 a-d**	**35.7 abc**	**15.6 a-d**
4	Manzate + Badge* (6 applications)	1.6 qt + 2 pt	28-Jun 9-Jul 19-Jul 30-Jul 10-Aug 23-Aug	28.6 e	**4.6 g-j**	$1,229 de	7692 cd	231 bcd	33.4 de	15.4 b-e
	Badge* (1 application)	2 pt	30-Aug							
11	Priaxor + Manzate* (2 applications)	8 fl oz + 1.6 qt	28-Jun 23-Jul	34.9 e	**2.2 ij**	$1,171 ef	7421 de	**233 a-d**	31.9 ef	**15.6 a-d**
	Manzate* (2 applications)	1.6 qt	13-Jul 7-Aug							
	Inspire XT + Manzate* (1 application)	7 fl oz + 1.6 qt	18-Aug							
	Badge* (1 application)	2 pt	30-Aug							
1	Manzate* (6 applications)	1.6 qt	28-Jun 9-Jul 19-Jul 30-Jul 10-Aug 23-Aug	38.0 e	**2.1 ij**	$1,233 de	7381 de	231 bcd	31.9 ef	**15.6 a-d**
	Badge* (1 application)	2 pt	30-Aug							
10	Inspire XT + Manzate* (1 application)	7 fl oz + 1.6 qt	28-Jun	53.1 d	**3.0 ij**	$1,278 cd	7767 cd	228 b-e	34.1 bcd	15.4 cde
	Manzate* (2 applications)	1.6 qt	17-Jul 10-Aug							
	Super Tin + Manzate* (1 application)	8 fl oz + 1.6 qt	27-Jul							
	Proline + Preference + Manzate (1 application)	5.7 fl oz +0.125 % + 1.6	22-Aug							

*Treatments sprayed with Masterlock (6.4 fl oz)

Na Bicarb: Sodium Bicarbonate

Means followed by the same letter are not significantly different. Duncans New MRT 5%.

Net $/A: Assume a $40 beet payment and trial average RWST with fungicide costs subtracted off.

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

Evaluate Protectant Fungicides for Control of *Cercospora beticola* and *Alternaria alternata* leafspot in Sugarbeets

Laker Agronomy Field, Elkton, MI - 2018

No.	Treatment	Rate /A	Applic Timing	% Leafspot Damage 21-Sep	% Leafspot Damage 7-Sep	Net $/A	RWSA	RWST	T/A	% SUC
22	Priaxor + Manzate + Na Bicarb* (2 applications)	8 fl oz + 1.6 qt + 5 lbs	28-Jun 23-Jul	68.8 c	**3.0 ij**	$1,234 de	7814 cd	231 bcd	33.8 cde	15.5 bcd
	Manzate + Na Bicarb* (2 applications)	1.6 qt + 5 lb	13-Jul 7-Aug							
	Inspire + Manzate + Na Bicarb* (1 application)	7 fl oz + 1.6 qt + 5 lb	18-Aug							
	Badge* (1 application)	2 pt	30-Aug							
5	Cuprofix* (6 applications)	2 lb	28-Jun 9-Jul 19-Jul 30-Jul 10-Aug 23-Aug	71.9 c	9.4 e-h	$1,145 fg	6984 ef	223 def	31.3 f	15.0 def
	Badge* (1 application)	2 pt	30-Aug							
3	Badge* (6 applications)	3 pt	28-Jun 9-Jul 19-Jul 30-Jul 10-Aug 23-Aug	73.8 c	7.9 f-i	$1,141 fg	7014 ef	224 c-f	31.3 f	15.1 def
	Badge* (1 application)	2 pt	30-Aug							
19	Inspire XT + Manzate + Na Bicarb* (1 application)	7 fl oz + 1.6 qt + 5 lb	28-Jun	74.4 c	**6.1 g-j**	$1,230 de	7469 de	223 def	33.6 de	15.0 def
	Manzate + Na Bicarb* (3 applications)	1.6 qt + 5 lb	17-Jul 10-Aug 23-Aug							
	Super Tin + Manzate* (1 application)	8 fl oz + 1.6 qt	27-Jul							
	Badge* (1 application)	2 pt	30-Aug							
2	Badge* (7 applications)	2 pt	28-Jun 9-Jul 19-Jul 30-Jul 10-Aug 23-Aug 30-Aug	75.0 c	10.0 d-g	$1,084 f-i	6637 fgh	220 ef	30.2 fg	14.8 efg

*Treatments sprayed with Masterlock (6.4 fl oz)

Na Bicarb: Sodium Bicarbonate

Means followed by the same letter are not significantly different. Duncans New MRT 5%.

Net $/A: Assume a $40 beet payment and trial average RWST with fungicide costs subtracted off.

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

Evaluate Protectant Fungicides for Control of *Cercospora beticola* and *Alternaria alternata* leafspot in Sugarbeets

Laker Agronomy Field, Elkton, MI - 2018

No.	Treatment	Rate /A	Applic Timing	% Leafspot Damage 21-Sep	% Leafspot Damage 7-Sep	Net $/A	RWSA	RWST	T/A	% SUC
18	Badge + Na Bicarb + NIS* (6 applications)	2 pt + 5 lb + 0.125%	28-Jun 9-Jul 19-Jul 30-Jul 10-Aug 23-Aug	80.6 bc	12.5 c-f	$1,096 f-i	6776 fg	223 def	30.4 fg	15.0 def
	Badge* (1 application)	2 pt	30-Aug							
17	Manzate + Na Bicarb + NIS* (6 applications)	1.6 qt + 5 lb + 0.125%	28-Jun 9-Jul 19-Jul 30-Jul 10-Aug 23-Aug	89.4 ab	7.5 f-i	$1,105 fgh	6713 fgh	219 ef	30.6 fg	14.8 efg
	Badge* (1 application)	2 pt	30-Aug							
24	Na Bicarb + Sun Spray (6 applications)	5 lb + 1 qt	28-Jun 9-Jul 19-Jul 30-Jul 10-Aug 23-Aug	91.3 ab	12.4 c-f	$987 j	6242 hij	216 fg	28.9 gh	14.7 fg
	Badge* (1 application)	2 pt	30-Aug							
16	Ammonium Bicarbonate + NIS* (6 applications)	5 lb + 0.125%	28-Jun 9-Jul 19-Jul 30-Jul 10-Aug 23-Aug	92.5 ab	14.5 b-e	$1,105 fgh	6477 ghi	215 fg	30.1 fg	14.7 fg
	Badge* (1 application)	2 pt	30-Aug							
13	Na Bicarb + NIS* (6 applications)	2.5 lb + 0.125%	28-Jun 9-Jul 19-Jul 30-Jul 10-Aug 23-Aug	93.8 ab	12.9 c-f	$1,078 ghi	6326 g-j	217 f	29.1 gh	14.7 fg
	Badge* (1 application)	2 pt	30-Aug							

*Treatments sprayed with Masterlock (6.4 fl oz)

Na Bicard: Sodium Bicarbonate

Means followed by the same letter are not significantly different. Duncans New MRT 5%.

Net $/A: Assume a $40 beet payment and trial average RWST with fungicide costs subtracted off.

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

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Evaluate Protectant Fungicides for Control of *Cercospora beticola* and *Alternaria alternata* leafspot in Sugarbeets

Laker Agronomy Field, Elkton, MI - 2018

No.	Treatment	Rate /A	Applic Timing	% Leafspot Damage 21-Sep	% Leafspot Damage 7-Sep	Net $/A	RWSA	RWST	T/A	% SUC
23	Na Bicarb + Sun Spray (6 applications)	5 lb + 1 qt	28-Jun 9-Jul 19-Jul 30-Jul 10-Aug 23-Aug	95.0 a	15.6 bcd	$1,013 ij	5916 jk	217 fg	27.3 hi	14.6 fg
	Badge* (1 application)	2 pt	30-Aug							
15	Milstop + NIS* (6 applications)	5 lb + 0.125%	28-Jun 9-Jul 19-Jul 30-Jul 10-Aug 23-Aug	97.5 a	16.6 bc	$665 l	5610 k	217 f	25.8 i	14.7 fg
	Badge* (1 application)	2 pt	30-Aug							
14	Sodium Bicarbonate + NIS* (6 applications)	5 lb + 0.125%	28-Jun 9-Jul 19-Jul 30-Jul 10-Aug 23-Aug	98.8 a	18.9 b	$1,038 hij	6058 ijk	216 fg	28.0 h	14.8 efg
	Badge* (1 application)	2 pt	30-Aug							
25	Untreated			100.0 a	37.5 a	$786 k	4445 l	207 g	21.5 j	14.2 g
	Average			56.55	8.19	$1,176.4	7179.3	226.0	31.64	15.24
	LSD 5%			11.84	4.99	77.1	436.0	8.7	1.84	0.53
	CV %			14.9	43.2	4.7	4.3	2.7	4.1	2.5

Means followed by the same letter are not significantly different. Duncans New MRT 5%.

*Treatments sprayed with Masterlock (6.4 fl oz)

Na Bicarb: Sodium Bicarbonate

**All treatments were sprayed with a maintenance spray of Badge @ 2pt/A and Masterlock @ 6.4 fl oz/A on 9/18

Comments: The leafspot infection (*Alternaria alternata* and *Cercospora beticola*) was very high. Echo at 3 pt/A and Super Tin + Topsin treatments provided the best leafspot control. Triazole and strobilurin treatments were less effective. Most treatments were overwhelmed by the intense disease pressure and more fungicide applications would have been needed to achieve acceptable control. Bicarbonates alone gave some early protection.

Net $/A: Assume a $40 beet payment and trial average RWST with fungicide costs subtracted off.

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

Control of Cercospora Leafspot with Fungicides Using Six Different Spray Tips
Wark, Akron , MI - 2018

Trial Quality: Good
Variety: B-149N
Planted: May 8
Harvested: Oct 5
Plots: 6 rows X 38 ft, 4 reps
Row Spacing: 22 inches

Soil Info: Loam
% OM: 2.1 **pH:** 7.8 **CEC:** 15.9
P: below opt **K:** above opt
Mn: high **B:** med
Added N: 135 lbs.
Previous Crop: Soybeans

Rhizoc Level: Low
Cerc. Control: See trts.
Problems: Slope
Seeding Rate: 4.1 inches
Rainfall: 17.2 inches
Beets/100 ft: ~189

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

No.	Treatment	Droplet Size	% Leafspot Damage		Net $/A	RWSA	RWST	T/A	% SUC	% CJP
			20-Sep	31-Aug						
6	TTJ60 11002*	Medium	**43.1 e**	**4.6 d**	**$1,318 ab**	**6776 ab**	**198 ab**	**34.2 ab**	13.9	**95.1 ab**
4	HYPRO 3D 02*	Fine	**46.3 de**	**4.0 d**	**$1,298 ab**	**6678 ab**	**194 ab**	**34.5 ab**	13.7	**95.0 ab**
2	AIXR 11002*	Medium	58.1 d	**5.5 d**	**$1,301 ab**	**6692 ab**	**196 ab**	**34.1 ab**	13.7	**95.2 ab**
3	TDAT 02*	Medium	71.9 c	**11.1 cd**	$1,088 cd	5664 c	**194 ab**	29.3 c	13.7	**95.0 ab**
5	TTI 11002*	Xtra Coarse	79.4 bc	**8.8 cd**	$1,188 bc	6149 bc	**194 ab**	31.8 bc	13.6	**95.1 ab**
1	TeeJet 8002XR*	V. Fine	91.3 ab	**9.8 cd**	$1,116 c	5800 c	**199 ab**	29.1 c	13.8	**95.5 ab**
10	HYPRO 3D 02**	Fine	91.6 ab	23.9 bc	**$1,421 a**	**7055 a**	**198 ab**	**35.6 a**	13.8	**95.2 ab**
7	TeeJet 8002XR**	V. Fine	93.8 a	17.3 bc	**$1,351 ab**	**6720 ab**	**193 ab**	**34.8 ab**	13.6	**95.5 a**
9	TDAT 02**	Medium	93.8 a	22.5 bc	**$1,384 a**	**6876 ab**	**192 ab**	**35.7 a**	13.5	**95.4 ab**
12	TTJ60 11002**	Medium	95.0 a	18.3 bc	**$1,465 a**	**7268 a**	**206 a**	**35.1 a**	14.3	**95.3 ab**
8	AIXR 11002**	Medium	95.0 a	26.5 b	**$1,373 a**	**6826 ab**	**193 ab**	**35.4 a**	13.5	**95.3 ab**
11	TTI 11002**	Xtra Coarse	97.5 a	23.8 bc	**$1,360 a**	**6760 ab**	191 b	**35.5 a**	13.5	95.0 b
13	Untreated		100.0 a	43.8 a	$777 d	3754 d	164 c	22.8 c	11.9	93.5 c

Average	81.27	16.89	$1,264.5	6386.0	193.2	32.92	13.58	95.08
LSD 5%	12.76	13.45	150.6	727.2	12.7	2.76	n.s.	0.48
CV %	10.9	55.1	8.2	7.9	4.6	5.8	3.7	0.4

Means followed by the same letter are not significantly different. Duncans New MRT 5%.

*Treatments 1-6 received the same spray program.
A - July 10th: Inspire XT @ 7 fl oz. + Manzate @ 1.6 qt. + Masterlock @ 6.4 fl oz.
B - August 2nd: Super Tin @ 8 fl oz. + Manzate @ 1.6 qt. + Masterlock @ 6.4 fl oz.
C - August 16th: Manzate @ 1.6 qt. + Masterlock @ 6.4 fl oz.
D - August 30th: Proline @ 5.7 fl oz. + Manzate @ 1.6 qt. + Masterlock @ 6.4 fl oz.

**Treatments 7-12 received the same spray program.
ABCD - July 10th, July 26th, August 10th, August 30th: Manzate @ 1.6 qt. + Masterlock @ 6.4 fl oz.

Net $/A: Assume a $40 beet payment and trial average RWST with fungicide costs subtracted off.
Bold: Results are not statistically different from top-ranking treatment in each column.

Control of Leafspot Diseases in Sugarbeets With Fungicides Using Different Spray Tips
Wark, Akron, MI - 2018

No.	Treatment	Nozzle	Droplet Size	% Leafspot Damage	Net $/Acre	RWSA	RWST
6	Triazole / S. Tin / Manz.	TTJ60 11002	Medium	**24 h**	**$1,318 ab**	**6776 ab**	**198 ab**
4	Triazole / S. Tin / Manz.	HYPRO 3D 02	Fine	**25 h**	**$1,298 ab**	**6678 ab**	**194 ab**
2	Triazole / S. Tin / Manz.	AIXR 11002	Medium	32 g	**$1,301 ab**	**6692 ab**	**196 ab**
3	Triazole / S. Tin / Manz.	TDAT 02	Medium	39 f	$1,118 c	5813 c	**194 ab**
5	Triazole / S. Tin / Manz.	TTI 11002	Coarse	42 ef	$1,188 bc	6149 bc	**194 ab**
1	Triazole / S. Tin / Manz.	Tee Jet 8002 XR	Very Fine	46 de	$1,116 c	5800 c	**199 ab**
7	Manzate Max	Tee Jet 8002 XR	Very Fine	52 cd	**$1,351 ab**	**6720 ab**	**193 ab**
10	Manzate Max	HYPRO 3D 02	Fine	54 bc	**$1,421 a**	**7055 a**	**198 ab**
12	Manzate Max	TTJ60 11002	Medium	55 bc	**$1,465 a**	**7268 a**	**206 a**
9	Manzate Max	TDAT 02	Medium	55 bc	**$1,384 a**	**6876 ab**	**192 ab**
11	Manzate Max	TTI 11002	Coarse	58 bc	**$1,360 a**	**6760 ab**	191 b
8	Manzate Max	AIXR 11002	Medium	59 b	**$1,373 a**	**6826 ab**	**193 ab**
13	Untreated Check			74 c	$777 c	3754 c	164 c
Average				47.4	$1,266.8	6397.5	193.2
LSD 5%				6.0	$148.6	717.9	12.7
CV%				8.8	8.1	7.8	4.6

Means followed by the same letter are not significantly different. Duncans New MRT 5%.

Fungicides were applied at recommended rates and Masterlock was included in all treatments

Each fungicide program was applied 4 times

Comments: Six different nozzle tips were utilized to apply fungicides for Cercospora (*Cercospora beticola*) and Alternaria (*Alternaria alternata*) leafspot control. Two fungicide programs were evaluated: 1: Triazole / Super Tin / Manzate program and 2: Manzate alone program. The leafspot pressure was high. The applications were started late to stress the trial. The Triazole / Super Tin program provided better leafspot control than the straight Manzate program. With respect to nozzle tips, with the Triazole / Super Tin (Trts 1-6), the HYPRO 3D (fine droplet size) and the TT J60 (medium droplet size) provided the best results. In the straight Manzate (Trts 7-12) Tee Jet XR (very fine) gave the best results followed by the HYPRO and TT J60 tips. Coarse nozzle tips were less effective. Leafspot % damage is an average of 2 ratings.

Net $/A: Assume a $40 beet payment and trial average RWST with fungicide costs subtracted off.

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

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Evaluate Sticker / Spreaders added to Fungicides for *Cercospora beticola* and *Alternaria alternata* Leafspot Control in Sugarbeets

Average of 2 Locations - 2018

Trial Quality: Good
Variety: B-149N
Plots: 6 rows X 38 ft, 3 reps
Row Spacing: 22 inches
Soil and Other Info: See individual trials
Application: JD 3520 tractor mounted plot sprayer, compressed air, 100 psi, 25 gpa
Rhizoc Level: Low
Cerc Control: See individual trials
Problems: None
Seeding Rate: 4.1 inches
Beets/100 ft: ~220

No.	Treatment	Sticker	% Leafspot Damage Avg	Net $/A	RWSA	RWST	T/A	% SUC	% CJP
48	Super Tin	Reguard Diligence	**0.5 s**	**$1,419 a-h**	**8057 a-f**	**219 a-h**	**37.1 a-f**	**15.0 a-h**	95.7
46	Super Tin	Masterlock	**1.0 rs**	**$1,467 abc**	**8168 a-d**	**219 a-g**	**37.5 a-d**	**15.0 a-h**	95.7
50	Super Tin	Cide Winder	**1.1 rs**	$1,406 c-j	7823 b-l	212 e-l	**37.0 a-f**	14.7 c-o	95.8
47	Super Tin	Reguard	**1.2 rs**	$1,409 c-j	**7928 a-i**	215 b-l	**37.3 a-e**	14.9 b-m	95.9
52	Super Tin	Liberate	**1.4 rs**	**$1,430 a-g**	**7953 a-g**	**218 a-i**	**36.8 a-g**	**15.1 a-g**	95.4
49	Super Tin	Coron 25-0-0 Cide Winder	**2.1 rs**	$1,399 c-k	7890 b-k	**218 a-i**	**36.8 a-g**	**14.9 a-k**	95.8
51	Super Tin	LI 700	**2.3 rs**	**$1,422 a-h**	**7906 a-j**	**217 a-j**	**36.8 a-g**	**14.9 a-k**	96.3
53	Super Tin	Wet-Sol 99	**3.6 qrs**	**$1,443 a-e**	**8010 a-f**	**224 a-e**	**36.2 a-i**	**15.3 a-d**	95.7
54	Super Tin	No Sticker	**3.7 p-s**	**$1,479 abc**	**8162 a-e**	**224 a-d**	**36.7 a-g**	**15.3 abc**	96.1
11	EBDC (7 Day)	Reguard	**0.6 s**	**$1,459 a-d**	**8314 abc**	**220 a-f**	**38.0 ab**	**15.2 a-e**	96.1
12	EBDC (7 Day)	Reguard Diligence	**0.8 rs**	$1,409 c-j	**8159 a-e**	**225 abc**	**36.6 a-h**	**15.4 ab**	95.6
10	EBDC (7 Day)	Masterlock	**0.9 rs**	$1,383 c-m	7833 b-l	**218 a-i**	**36.3 a-i**	14.7 c-o	95.6
16	EBDC (7 Day)	Liberate	**1.1 rs**	**$1,532 a**	**8597 a**	**228 a**	**38.1 a**	**15.5 a**	96.5
14	EBDC (7 Day)	Cide Winder	**1.1 rs**	$1,413 b-i	**7951 a-h**	**218 a-i**	**36.8 a-g**	**14.9 a-l**	95.6
15	EBDC (7 Day)	LI 700	**1.3 rs**	$1,389 c-l	**8065 a-f**	215 b-l	**36.6 a-h**	14.8 b-n	95.8
18	EBDC (7 Day)	No Sticker	**1.5 rs**	**$1,528 ab**	**8476 ab**	**225 ab**	**37.7 abc**	**15.3 a-d**	95.7
13	EBDC (7 Day)	Coron 25-0-0 Cide Winder	**1.8 rs**	$1,399 c-k	**8041 a-f**	**218 a-i**	**37.3 a-e**	**14.9 a-l**	95.7
17	EBDC (7 Day)	Wet-Sol 99	**1.8 rs**	**$1,433 a-g**	**8051 a-f**	**220 a-g**	**36.9 a-g**	**15.1 a-f**	95.8
19	EBDC (10 Day)	Masterlock	**4.9 o-s**	$1,369 c-o	7625 c-o	213 e-l	**36.1 a-j**	14.6 e-o	95.6
21	EBDC (10 Day)	Reguard Diligence	**6.3 n-s**	$1,391 c-l	7882 b-k	**218 a-i**	**36.5 a-i**	**15.0 a-i**	95.8
24	EBDC (10 Day)	LI 700	**6.8 m-s**	**$1,441 a-f**	**7955 a-g**	214 c-l	**37.2 a-e**	14.8 b-n	95.6
27	EBDC (10 Day)	No Sticker	7.9 l-r	$1,385 c-m	7591 d-o	212 f-l	**36.0 a-j**	14.7 d-o	96.0
22	EBDC (10 Day)	Coron 25-0-0 Cide Winder	9.5 k-g	$1,301 h-r	7571 d-o	213 d-l	34.8 e-o	14.7 c-o	95.7
20	EBDC (10 Day)	Reguard	9.8 j-q	$1,396 c-l	7805 b-l	216 b-j	**36.1 a-j**	**14.9 a-l**	96.0
26	EBDC (10 Day)	Wet-Sol 99	10.5 j-q	$1,403 c-k	7733 c-l	212 f-l	**36.6 a-h**	14.5 f-o	95.5
25	EBDC (10 Day)	Liberate	10.6 j-p	$1,380 c-n	7625 c-o	212 f-l	**35.9 a-k**	14.6 e-o	95.7
23	EDBC (10 Day)	Cide Winder	12.7 h-n	$1,396 c-l	7718 c-m	220 a-g	35.3 c-o	**15.0 a-h**	96.1

Evaluate Sticker / Spreaders added to Fungicides for *Cercospora beticola* and *Alternaria alternata* Leafspot Control in Sugarbeets

Average of 2 Locations - 2018

No.	Treatment	Sticker	% Leafspot Damage Avg	Net $/A	RWSA	RWST	T/A	% SUC	% CJP
34	EBDC (13 Day)	Liberate	11.5 i-o	$1,343 d-p	7379 f-q	209 g-m	35.4 b-n	14.4 h-p	95.2
29	EBDC (13 Day)	Reguard	13.4 f-n	$1,287 j-r	7165 l-r	208 i-m	34.7 e-o	14.3 i-p	95.6
30	EBDC (13 Day)	Reguard Diligence	13.6 f-m	$1,294 i-r	7280 g-q	207 i-m	35.1 c-o	14.3 j-p	95.6
36	EBDC (13 Day)	No Sticker	16.2 e-k	$1,317 g-p	7196 j-q	208 h-m	34.8 e-o	14.4 i-p	95.9
33	EBDC (13 Day)	LI 700	16.8 d-j	$1,265 m-s	6967 o-r	209 g-m	33.6 j-o	14.4 h-p	95.5
28	EBDC (13 Day)	Masterlock	18.7 c-h	$1,237 p-s	7187 k-q	205 j-m	33.3 k-o	14.3 l-p	95.6
31	EBDC (13 Day)	Coron 25-0-0 Cide Winder	22.6 b-e	$1,158 s	6502 r	199 m	32.9 no	13.9 p	95.8
32	EBDC (13 Day)	Cide Winder	23.2 bcd	$1,216 qrs	6710 qr	204 lm	33.2 l-o	14.2 nop	95.8
35	EBDC (13 Day)	Wet-Sol 99	26.8 b	$1,237 p-s	6814 pqr	205 klm	33.6 j-o	14.1 op	95.8
43	Badge	Liberate	**6.4 n-s**	$1,216 qrs	6986 n-r	212 f-l	33.2 mno	14.6 e-o	96.0
44	Badge	Wet-Sol 99	**6.8 m-s**	$1,227 p-s	7017 m-r	211 f-l	33.2 mno	14.6 e-o	95.2
45	Badge	No Sticker	11.3 i-o	$1,282 k-r	7236 h-q	208 i-m	35.1 c-o	14.5 g-p	95.7
38	Badge	Reguard	12.1 h-n	$1,237 p-s	7204 j-q	211 f-l	34.4 g-o	14.6 e-o	95.5
42	Badge	LI 700	13.2 g-n	$1,276 l-s	7294 g-q	214 c-l	34.0 h-o	14.7 b-o	96.1
37	Badge	Masterlock	13.3 f-n	$1,322 e-q	7588 d-o	218 a-i	35.1 c-o	14.8 b-m	95.8
39	Badge	Reguard Diligence	13.7 f-m	$1,251 o-s	7391 f-q	209 g-m	35.4 b-n	14.5 f-o	95.4
40	Badge	Coron 25-0-0 Cide Winder	13.9 f-l	$1,157 s	6802 pqr	205 j-m	33.1 mno	14.3 l-p	95.4
41	Badge	Cide Winder	14.6 f-l	$1,335 e-q	7608 c-o	**219 a-g**	34.5 f-o	**15.1 a-g**	95.7
2	Triazole	Reguard	9.7 j-q	$1,318 f-q	7611 c-o	215 b-k	35.6 a-m	14.8 b-n	95.9
6	Triazole	LI 700	17.8 c-i	$1,260 n-s	7216 i-q	208 h-m	34.9 d-o	14.2 m-p	95.4
3	Triazole	Reguard Diligence	18.0 c-i	$1,319 f-q	7690 c-n	215 b-k	**35.9 a-k**	14.8 b-n	95.5
5	Triazole	Cide Winder	20.1 c-g	$1,380 c-n	7848 b-l	**218 a-i**	**35.8 a-m**	**15.0 a-j**	95.2
1	Triazole	Masterlock	20.2 b-f	$1,299 h-r	7458 d-p	209 g-m	**35.8 a-l**	14.4 g-p	95.5
4	Triazole	Coron 25-0-0 Cide Winder	22.2 b-e	$1,194 rs	6972 o-r	213 d-l	32.7 o	14.7 c-o	95.9
7	Triazole	Liberate	23.4 bcd	$1,304 h-r	7445 e-p	213 e-l	35.3 c-o	14.6 e-o	95.8
9	Triazole	No Sticker	24.2 bc	$1,331 e-q	7538 d-o	213 e-l	**35.6 a-m**	14.7 d-o	95.9
8	Triazole	Wet-Sol 99	34.5 a	$1,212 qrs	6959 o-r	207 i-m	33.9 i-o	14.3 k-p	96.0

Average	10.47	$1,343.7	7591.7	213.9	35.58	14.72	95.72
LSD 5%	5.78	98.6	571.5	8.9	2.12	0.51	0.64
CV%	34.1	4.5	4.6	2.6	3.7	2.1	0.4

Means followed by the same letter are not significantly different. Duncans New MRT 5%.

Net $/A: Assume a $40 beet payment and trial average RWST with fungicide costs subtracted off.

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

Evaluate Sticker / Spreaders added to Fungicides for *Cercospora beticola* and *Alternaria alternata* Leafspot Control in Sugarbeets

Average of 2 Locations - 2018

Effect of Spreader / Sticker

No.	Treatment	% Leafspot Damage Avg	Net $/A	RWSA	RWST	T/A	% SUC	% CJP
2	Reguard	**7.8 e**	**$1,351 abc**	**7671 a**	214	**36.0 ab**	14.8	95.8
3	Reguard Diligence	**8.8 de**	**$1,347 abc**	**7743 a**	215	**36.1 a**	14.8	95.6
7	Liberate	**9.1 de**	**$1,368 ab**	**7664 a**	215	**35.8 ab**	14.8	95.8
6	LI 700	**9.7 cde**	$1,342 bc	**7567 ab**	213	**35.5 ab**	14.7	95.8
1	Masterlock	**9.9 b-e**	$1,346 bc	**7643 ab**	214	**35.7 ab**	14.6	95.6
9	No Sticker	10.8 bcd	**$1,387 a**	**7700 a**	215	**36.0 a**	14.8	95.9
4	Coron 25-0-0 Cide Winder	12.0 abc	$1,268 d	7296 c	211	34.6 c	14.6	95.7
5	Cide Winder	12.1 ab	**$1,357 abc**	**7610 ab**	215	**35.4 abc**	14.8	95.7
8	Wet-Sol 99	14.0 a	$1,326 c	7431 bc	213	35.1 bc	14.7	95.7

Average	10.47	$1,343.7	7591.7	213.9	35.58	14.72	95.72
LSD 5%	2.36	40.3	233.3	3.6	0.87	0.21	0.26
CV%	34.1	4.5	4.6	2.6	3.7	2.1	0.4

Effect of Fungicide Program

No.	Treatment	% Leafspot Damage Avg	Net $/A	RWSA	RWST	T/A	% SUC	% CJP
2	EBDC (7 Day)	**1.2 e**	**$1,438 a**	**8165 a**	**221 a**	**37.1 a**	**15.1 a**	95.8
6	Super Tin	**1.9 e**	**$1,431 a**	7989 b	**218 a**	**36.9 a**	**15.0 a**	95.8
3	EBDC (10 Day)	8.8 d	$1,385 b	7723 c	214 b	36.1 b	14.8 b	95.8
5	Badge	11.7 c	$1,256 d	7236 e	212 b	34.2 d	14.6 b	95.6
4	EBDC (13 Day)	18.1 b	$1,262 cd	7022 f	206 c	34.1 d	14.3 c	95.6
1	Triazole	21.1 a	$1,291 c	7415 d	212 b	35.1 c	14.6 b	95.7

Average	10.46	$1,343.7	7591.7	213.9	35.58	14.72	95.72
LSD 5%	2.12	32.4	169.0	3.49	0.57	0.22	0.23
CV%	33.4	4.0	3.7	2.7	2.7	2.5	0.4

Means followed by the same letter are not significantly different. Duncans New MRT 5%.

Comments: Reguard, Reguard + Diligence, Liberate, LI 700 and Masterlock appeared to improve fungicide efficacy in these trials. Coron, Cidewinder and Wet-Sol did not improve fungicide efficacy. None of the sticker treatments extended the fungicidal activity of an EBDC. Protectant fungicides were more effective than Triazole fungicides. In past years stickers have improved fungicide efficacy more than in this years trials, possibly due to lack of rainfall during the fungicide application season in 2018.

Net $/A: Assume a $40 beet payment and trial average RWST with fungicide costs subtracted off.
Bold: Results are not statistically different from top-ranking treatment in each column.

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Evaluate Sticker / Spreaders added to Fungicides for *Cercospora beticola* and *Alternaria alternata* Leafspot Control in Sugarbeets

Auernhamer, Richville, MI - 2018

Trial Quality: Good
Variety: B-149N
Planted: April 30
Harvested: Oct 3
Plots: 6 rows X 38 ft, 3 reps
Row Spacing: 22 inches

Soil Info: Sandy Clay Loam
%OM: 3.4 **pH:** 7.6 **CEC:** 17.1
P: above opt **K:** above opt
Mn: high **B:** med
Added N: 135 lbs.
Prev Crop: Corn

Rhizoc Level: Low
Cerc Control: See trts.
Problems: None
Seeding Rate: 4.1 inches
Rainfall: 23.1 inches
Beets/100 ft: ~225

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

No.	Treatment*	Sticker	# Applic	% Leafspot Damage 5-Sep	Net $/A	RWSA	RWST	T/A	% SUC
48	Super Tin	Reguard Diligence	5	**0.5 d**	$1,643 b-n	9064 b-i	208 c-i	**43.4 a-l**	14.4 c-h
46	Super Tin	Masterlock	5	**0.9 d**	**$1,798 a-d**	**9742 a-d**	**213 a-g**	**45.7 a-e**	**14.7 a-g**
50	Super Tin	Cide Winder	5	**1.2 d**	$1,662 b-l	9004 b-j	205 d-i	**44.0 a-j**	14.2 c-h
52	Super Tin	Liberate	5	**1.9 d**	$1,689 b-j	9145 b-i	207 d-i	**44.2 a-j**	14.5 c-h
47	Super Tin	Reguard	5	**2.0 d**	$1,600 d-p	8758 d-l	201 e-i	**43.5 a-l**	14.1 e-h
54	Super Tin	No Sticker	5	**2.3 d**	**$1,742 a-i**	**9372 a-g**	**213 a-g**	**44.0 a-j**	**14.8 a-f**
49	Super Tin	Coron 25-0-0 Cide Winder	5	**2.7 d**	$1,657 b-m	9077 b-i	203 d-i	**44.7 a-i**	14.3 c-h
51	Super Tin	LI 700	5	**3.3 d**	**$1,709 a-j**	**9250 a-h**	207 c-i	**44.6 a-i**	14.5 c-h
53	Super Tin	Wet-Sol 99	5	**3.7 d**	**$1,764 a-g**	**9530 a-f**	**213 a-g**	**44.8 a-i**	**14.7 a-g**
16	EBDC (7 Day)	Liberate	8	**0.6 d**	**$1,830 ab**	**9986 ab**	**217 a-e**	**46.0 abc**	**15.0 a-f**
17	EBDC (7 Day)	Wet-Sol 99	8	**0.8 d**	**$1,771 a-g**	**9670 a-e**	**214 a-f**	**45.2 a-h**	**14.9 a-f**
11	EBDC (7 Day)	Reguard	8	**0.8 d**	**$1,800 abc**	**9940 abc**	**215 a-f**	**46.3 a**	**15.0 a-f**
14	EBDC (7 Day)	Cide Winder	8	**0.9 d**	**$1,791 a-e**	**9783 a-d**	**212 a-g**	**46.1 ab**	**14.6 a-g**
12	EBDC (7 Day)	Reguard Diligence	8	**1.2 d**	**$1,746 a-i**	**9766 a-d**	218 a-d	**44.7 a-i**	**15.1 a-d**
10	EBDC (7 Day)	Masterlock	8	**1.2 d**	**$1,714 a-j**	**9415 a-g**	208 c-i	**45.2 a-h**	14.5 c-h
18	EBDC (7 Day)	No Sticker	8	**1.4 d**	**$1,895 a**	**10237 a**	**224 abc**	**45.8 a-d**	**15.2 abc**
13	EBDC (7 Day)	Coron 25-0-0 Cide Winder	8	**1.6 d**	$1,606 c-p	8952 b-k	204 d-i	**43.8 a-j**	14.2 d-h
15	EBDC (7 Day)	LI 700	8	**1.9 d**	**$1,760 a-h**	**9619 a-f**	**211 a-h**	**45.6 a-f**	**14.6 a-g**
24	EBDC (10 Day)	LI 700	6	**0.9 d**	**$1,769 a-g**	**9515 a-f**	**215 a-f**	**44.3 a-i**	**14.9 a-f**
19	EBDC (10 Day)	Masterlock	6	**1.0 d**	$1,523 j-p	8262 h-l	202 d-i	40.9 i-m	14.1 fgh
23	EBDC (10 Day)	Cide Winder	6	**1.6 d**	$1,693 b-j	9117 b-i	**216 a-e**	**42.2 a-l**	**14.9 a-f**
20	EBDC (10 Day)	Reguard	6	**1.9 d**	**$1,759 a-h**	**9558 a-f**	**219 a-d**	**43.8 a-j**	**15.0 a-e**
22	EBDC (10 Day)	Coron 25-0-0 Cide Winder	6	**2.3 d**	$1,611 c-o	8813 d-l	204 d-i	**43.4 a-l**	14.3 c-h
25	EBDC (10 Day)	Liberate	6	**2.3 d**	**$1,715 a-j**	**9237 a-h**	**212 a-g**	**43.5 a-k**	**14.7 a-g**
27	EBDC (10 Day)	No Sticker	6	**3.3 d**	**$1,703 a-j**	9109 b-i	205 d-i	**44.3 a-i**	14.4 c-h
26	EBDC (10 Day)	Wet-Sol 99	6	**3.3 d**	**$1,776 a-f**	**9543 a-f**	**210 a-i**	**45.5 a-g**	14.5 c-h
21	EBDC (10 Day)	Reguard Diligence	6	**4.2 d**	**$1,701 a-j**	**9351 a-g**	**211 a-i**	**44.4 a-i**	**14.6 a-g**

* All treatments were sprayed with a maintenance spray of Badge @ 2pt/A and Masterlock @ 6.4 fl oz/A on 9/18

Evaluate Sticker / Spreaders added to Fungicides for *Cercospora beticola* and *Alternaria alternata* Leafspot Control in Sugarbeets

Auernhamer, Richville, MI - 2018

No.	Treatment*	Sticker	# Applic	% Leafspot Damage 5-Sep	Net $/A	RWSA	RWST	T/A	% SUC
28	EBDC (13 day)	Masterlock	6	**1.8 d**	$1,594 e-p	8580 f-l	205 d-i	41.9 c-l	14.3 c-h
34	EBDC (13 Day)	Liberate	6	**3.0 d**	$1,690 b-j	9059 b-i	207 c-i	**43.6 a-j**	14.3 c-h
29	EBDC (10 Day)	Reguard	6	**4.0 d**	$1,598 e-p	8655 e-l	203 d-i	**42.6 a-l**	14.2 d-h
36	EBDC (13 Day)	No Sticker	6	**6.7 cd**	$1,578 f-p	8419 g-l	204 d-i	41.2 h-m	14.1 fgh
30	EBDC (13 Day)	Reguard Diligence	6	**7.7 cd**	$1,619 c-o	8842 d-k	208 c-i	42.6 a-l	14.4 c-h
33	EBDC (13 Day)	LI 700	6	**9.0 cd**	$1,562 h-p	8389 g-l	203 d-i	41.4 g-m	14.1 e-h
35	EBDC (13 Day)	Wet-Sol 99	6	15.3 bc	$1,540 j-p	8267 h-l	197 ghi	41.9 c-l	13.8 gh
31	EBDC (13 Day)	Coron 25-0-0 Cide Winder	6	19.8 ab	$1,429 op	7795 l	194 i	40.1 j-m	13.5 h
32	EBDC (13 Day)	Cide Winder	6	20.7 ab	$1,478 k-p	7948 kl	195 hi	40.7 i-m	13.8 gh
44	Copper	Wet-Sol 99	8	**1.6 d**	$1,607 c-p	8880 d-k	**214 a-f**	41.5 f-m	**14.9 a-f**
39	Copper	Reguard Diligence	8	**1.6 d**	$1,547 i-p	8798 d-l	206 d-i	**42.6 a-l**	14.4 c-h
40	Copper	Coron 25-0-0 Cide Winder	8	**1.9 d**	$1,452 nop	8216 h-l	209 b-i	39.4 klm	**14.6 a-g**
43	Copper	Liberate	8	**2.1 d**	$1,460 m-p	8125 i-l	206 d-i	39.4 lm	14.4 c-h
38	Copper	Reguard	8	**2.1 d**	$1,533 j-p	8614 f-l	205 d-i	42.1 b-l	14.4 c-h
42	Copper	LI 700	8	**2.3 d**	$1,615 c-o	8931 c-k	**215 a-f**	41.6 e-m	**14.9 a-f**
41	Copper	Cide Winder	8	**3.0 d**	$1,672 b-k	**9227 a-h**	**226 a**	40.9 i-m	**15.5 a**
37	Copper	Masterlock	8	**4.7 cd**	$1,559 i-p	8676 e-l	209 b-i	41.5 f-m	14.5 c-h
45	Copper	No Sticker	8	**6.0 cd**	$1,632 b-n	8930 c-k	201 e-i	**44.4 a-i**	14.2 d-h
5	Triazole	Cide Winder	5	**3.6 d**	**$1,717 a-j**	**9465 a-f**	**225 ab**	42.1 b-l	**15.5 a-b**
6	Triazole	LI 700	5	**4.7 cd**	$1,555 i-p	8619 f-l	205 d-i	**42.2 a-l**	14.1 e-h
2	Triazole	Reguard	5	**4.7 cd**	$1,575 g-p	8799 d-l	208 c-i	**42.2 a-l**	14.5 c-h
3	Triazole	Reguard Diligence	5	**6.3 cd**	$1,618 c-o	9103 b-i	**211 a-i**	**43.3 a-l**	**14.6 a-g**
7	Triazole	Liberate	5	**6.7 cd**	$1,651 b-m	9118 b-i	207 c-i	**44.0 a-j**	14.4 c-h
4	Triazole	Coron 25-0-0 Cide Winder	5	**8.3 cd**	$1,414 p	7980 jkl	**211 a-h**	37.8 m	14.5 b-g
1	Triazole	Masterlock	5	**9.2 cd**	$1,552 i-p	8629 e-l	207 d-i	41.8 d-l	14.4 c-h
9	Triazole	No Sticker	5	**10.0 cd**	$1,670 b-k	9164 b-i	208 c-i	**44.1 a-j**	14.4 c-h
8	Triazole	Wet-Sol 99	5	28.3 a	$1,470 l-p	8171 i-l	199 f-i	41.1 h-m	13.8 gh

Average	4.53	$1,644.6	9003.9	208.8	43.11	14.50
LSD 5%	8.9	158.6	827.8	13.2	3.3	0.7
CV%	121.5	6.0	5.7	3.9	4.7	3.2

* All treatments were sprayed with a maintenance spray of Badge @ 2pt/A and Masterlock @ 6.4 fl oz/A on 9/18

Means followed by same letter are not significantly different. Duncan's New MRT 5%.

Net $/A: Assume a $40 beet payment and trial average RWST with fungicide costs subtracted off.

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

Evaluate Sticker / Spreaders added to Fungicides for *Cercospora beticola* and *Alternaria alternata* Leafspot Control in Sugarbeets

Auernhamer, Richville, MI - 2018

Effect of Spreader / Sticker

No.	Treatment	% Leafspot Damage 5-Sep	Net $/A	RWSA	RWST	T/A	% SUC	% CJP
2	Reguard	**2.6 b**	**$1,644 ab**	**9054 a**	208	**43.4 a**	14.5	95.6
7	Liberate	**2.8 b**	**$1,673 ab**	**9112 a**	210	**43.5 a**	14.5	95.4
1	Masterlock	**3.1 b**	$1,623 b	**8884 a**	207	**42.8 ab**	14.4	95.3
3	Reguard Diligence	**3.6 b**	**$1,646 ab**	**9154 a**	210	**43.5 a**	14.6	95.2
6	LI 700	**3.7 b**	**$1,662 ab**	**9054 a**	209	**43.3 a**	14.5	95.7
9	No Sticker	**4.9 b**	**$1,703 a**	**9205 a**	209	**44.0 a**	14.5	95.6
5	Cide Winder	**5.2 b**	**$1,669 ab**	**9091 a**	213	**42.7 ab**	14.7	95.4
4	Coron 25-0-0 Cide Winder	**6.1 ab**	$1,528 c	8472 b	204	41.5 b	14.2	95.3
8	Wet-Sol 99	8.8 a	**$1,655 ab**	**9010 a**	208	**43.3 a**	14.4	95.4
Average		4.53	$1,644.6	9003.9	208.8	43.11	14.49	95.40
LSD 5%		3.64	64.7	337.9	n.s.	1.34	n.s.	n.s.
CV%		121.5	5.9	5.7	3.9	4.7	3.2	0.5

Effect of Fungicide Program

No.	Treatment	% Leafspot Damage 5-Sep	Net $/A	RWSA	RWST	T/A	% SUC	% CJP
2	EBDC (7 Day)	**1.1 b**	**$1,768 a**	**9707 a**	**214 a**	**45.4 a**	**14.8 a**	95.6
6	Super Tin	**2.1 b**	$1,696 b	9216 b	208 b	**44.3 ab**	14.5 b	95.5
3	EBDC (10 Day)	**2.3 b**	$1,694 b	9167 b	**210 ab**	43.6 b	**14.6 ab**	95.5
5	Copper	**2.8 b**	$1,564 c	8711 c	210 b	41.5 c	**14.6 ab**	95.3
1	Triazole	9.1 a	$1,580 c	8783 c	209 b	42.1 c	14.5 b	95.2
4	EBDC (13 Day)	9.8 a	$1,565 c	8439 d	202 c	41.8 c	14.1 c	95.3
Average		4.53	$1,644.6	9003.9	208.8	43.11	14.50	95.40
LSD 5%		4.30	51.9	270.9	3.6	1.36	0.23	n.s.
CV%		156.6	5.2	5.0	2.8	5.2	2.6	0.4

Means followed by the same letter are not significantly different. Duncans New MRT 5%.

Comments: Reguard, Liberate, Masterlock and LI 700 appeared to improve fungicide efficacy. Cide Winder, Coron 25-0-0 and Wet-Sol 99 did not improve the effectiveness of fungicides. None of the stickers extended the fungicidal activity of an EBDC. The Cercospora (*Cercospora beticola*) and Alteranaria (*Alternaria alternata*) leafspot pressure was high.

Net $/A: Assume a $40 beet payment and trial average RWST with fungicide costs subtracted off.
Bold: Results are not statistically different from top-ranking treatment in each column.

Evaluate Sticker / Spreaders added to Fungicides for *Cercospora beticola* and *Alternaria alternata* Leafspot Control in Sugarbeets

Auernhamer, Richville, MI - 2018

No.	Program	Sticker	Treatment	# App	Date
1	Triazole	Masterlock	Inspire + Manzate Manzate	3 2	7/11, 8/7, 9/4 7/28, 8/23
2	Triazole	Reguard	Inspire + Manzate Manzate	3 2	7/11, 8/7, 9/4 7/28, 8/23
3	Triazole	Reguard + Diligence	Inspire + Manzate Manzate	3 2	7/11, 8/7, 9/4 7/28, 8/23
4	Triazole	Coron 25-0-0 + Cidewinder	Inspire + Manzate Manzate	3 2	7/11, 8/7, 9/4 7/28, 8/23
5	Triazole	Cidewinder	Inspire + Manzate Manzate	3 2	7/11, 8/7, 9/4 7/28, 8/23
6	Triazole	LI 700	Inspire + Manzate Manzate	3 2	7/11, 8/7, 9/4 7/28, 8/23
7	Triazole	Liberate	Inspire + Manzate Manzate	3 2	7/11, 8/7, 9/4 7/28, 8/23
8	Triazole	Wet-Sol 99	Inspire + Manzate Manzate	3 2	7/11, 8/7, 9/4 7/28, 8/23
9	Triazole	No Sticker	Inspire + Manzate Manzate	3 2	7/11, 8/7, 9/4 7/28, 8/23
10	EBDC - (7 Day)	Masterlock	Manzate Badge	7 1	7/11, 7/19, 7/25, 8/1 8/7, 8/15, 8/23 8/31
11	EBDC - (7 Day)	Reguard	Manzate Badge	7 1	7/11, 7/19, 7/25, 8/1 8/7, 8/15, 8/23 8/31
12	EBDC - (7 Day)	Reguard + Diligence	Manzate Badge	7 1	7/11, 7/19, 7/25, 8/1 8/7, 8/15, 8/23 8/31
13	EBDC - (7 Day)	Coron 25-0-0 + Cidewinder	Manzate Badge	7 1	7/11, 7/19, 7/25, 8/1 8/7, 8/15, 8/23 8/31
14	EBDC - (7 Day)	Cidewinder	Manzate Badge	7 1	7/11, 7/19, 7/25, 8/1 8/7, 8/15, 8/23 8/31
15	EBDC - (7 Day)	LI 700	Manzate Badge	7 1	7/11, 7/19, 7/25, 8/1 8/7, 8/15, 8/23 8/31
16	EBDC - (7 Day)	Liberate	Manzate Badge	7 1	7/11, 7/19, 7/25, 8/1 8/7, 8/15, 8/23 8/31
17	EBDC - (7 Day)	Wet-Sol 99	Manzate Badge	7 1	7/11, 7/19, 7/25, 8/1 8/7, 8/15, 8/23 8/31
18	EBDC - (7 Day)	No Sticker	Manzate Badge	7 1	7/11, 7/19, 7/25, 8/1 8/7, 8/15, 8/23 8/31
19	EBDC - (10 Day)	Masterlock	Manzate	6	7/11, 7/20, 7/30, 8/9 8/20, 8/31
20	EBDC - (10 Day)	Reguard	Manzate	6	7/11, 7/20, 7/30, 8/9 8/20, 8/31

Evaluate Sticker / Spreaders added to Fungicides for *Cercospora beticola* and *Alternaria alternata* Leafspot Control in Sugarbeets
Auernhamer, Richville, MI - 2018

No.	Program	Sticker	Treatment	# App	Date
21	EBDC - (10 Day)	Reguard + Diligence	Manzate	6	7/11, 7/20, 7/30, 8/9 8/20, 8/31
22	EBDC - (10 Day)	Coron 25-0-0 + Cidewinder	Manzate	6	7/11, 7/20, 7/30, 8/9 8/20, 8/31
23	EBDC - (10 Day)	Cidewinder	Manzate	6	7/11, 7/20, 7/30, 8/9 8/20, 8/31
24	EBDC - (10 Day)	LI 700	Manzate	6	7/11, 7/20, 7/30, 8/9 8/20, 8/31
25	EBDC - (10 Day)	Liberate	Manzate	6	7/11, 7/20, 7/30, 8/9 8/20, 8/31
26	EBDC - (10 Day)	Wet-Sol 99	Manzate	6	7/11, 7/20, 7/30, 8/9 8/20, 8/31
27	EBDC - (10 Day)	No Sticker	Manzate	6	7/11, 7/20, 7/30, 8/9 8/20, 8/31
28	EBDC - (13 Day)	Masterlock	Manzate	5	7/11, 7/24, 8/6 8/20, 9/4
29	EBDC - (13 Day)	Reguard	Manzate	5	7/11, 7/24, 8/6 8/20, 9/4
30	EBDC - (13 Day)	Reguard + Diligence	Manzate	5	7/11, 7/24, 8/6 8/20, 9/4
31	EBDC - (13 Day)	Coron 25-0-0 + Cidewinder	Manzate	5	7/11, 7/24, 8/6 8/20, 9/4
32	EBDC - (13 Day)	Cidewinder	Manzate	5	7/11, 7/24, 8/6 8/20, 9/4
33	EBDC - (13 Day)	LI 700	Manzate	5	7/11, 7/24, 8/6 8/20, 9/4
34	EBDC - (13 Day)	Liberate	Manzate	5	7/11, 7/24, 8/6 8/20, 9/4
35	EBDC - (13 Day)	Wet-Sol 99	Manzate	5	7/11, 7/24, 8/6 8/20, 9/4
36	EBDC - (13 Day)	No Sticker	Manzate	5	7/11, 7/24, 8/6 8/20, 9/4
37	Copper	Masterlock	Badge	8	7/11, 7/19, 7/25, 8/1 8/7, 8/15, 8/23, 8/31
38	Copper	Reguard	Badge	8	7/11, 7/19, 7/25, 8/1 8/7, 8/15, 8/23, 8/31
39	Copper	Reguard + Diligence	Badge	8	7/11, 7/19, 7/25, 8/1 8/7, 8/15, 8/23, 8/31
40	Copper	Coron 25-0-0 + Cidewinder	Badge	8	7/11, 7/19, 7/25, 8/1 8/7, 8/15, 8/23, 8/31

Evaluate Sticker / Spreaders added to Fungicides for *Cercospora beticola* and *Alternaria alternata* Leafspot Control in Sugarbeets

Auernhamer, Richville, MI - 2018

No.	Program	Sticker	Treatment	App	Date
41	Copper	Cidewinder	Badge	8	7/11, 7/19, 7/25, 8/1 8/7, 8/15, 8/23, 8/31
42	Copper	LI 700	Badge	8	7/11, 7/19, 7/25, 8/1 8/7, 8/15, 8/23, 8/31
43	Copper	Liberate	Badge	8	7/11, 7/19, 7/25, 8/1 8/7, 8/15, 8/23, 8/31
44	Copper	Wet-Sol 99	Badge	8	7/11, 7/19, 7/25, 8/1 8/7, 8/15, 8/23, 8/31
45	Copper	No Sticker	Badge	8	7/11, 7/19, 7/25, 8/1 8/7, 8/15, 8/23, 8/31
46	Super Tin	Masterlock	Super Tin + Manzate Manzate	3 2	7/11, 8/6, 8/31 7/25, 8/20
47	Super Tin	Reguard	Super Tin + Manzate Manzate	3 2	7/11, 8/6, 8/31 7/25, 8/20
48	Super Tin	Reguard + Diligence	Super Tin + Manzate Manzate	3 2	7/11, 8/6, 8/31 7/25, 8/20
49	Super Tin	Coron 25-0-0 + Cidewinder	Super Tin + Manzate Manzate	3 2	7/11, 8/6, 8/31 7/25, 8/20
50	Super Tin	Cidewinder	Super Tin + Manzate Manzate	3 2	7/11, 8/6, 8/31 7/25, 8/20
51	Super Tin	LI 700	Super Tin + Manzate Manzate	3 2	7/11, 8/6, 8/31 7/25, 8/20
52	Super Tin	Liberate	Super Tin + Manzate Manzate	3 2	7/11, 8/6, 8/31 7/25, 8/20
53	Super Tin	Wet-Sol 99	Super Tin + Manzate Manzate	3 2	7/11, 8/6, 8/31 7/25, 8/20
54	Super Tin	No Sticker	Super Tin + Manzate Manzate	3 2	7/11, 8/6, 8/31 7/25, 8/20

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Evaluate Sticker / Spreaders added to Fungicides for *Cercospora beticola* and *Alternaria alternata* Leafspot Control in Sugarbeets

Laker Agronomy Field, Elkton, MI - 2018

Trial Quality: Good
Variety: B-149N
Planted: May 2
Harvested: Oct 18
Plots: 6 rows X 38 ft, 3 reps
Row Spacing: 22 inches

Soil Info: Clay Loam
%OM: 2.5 **pH:** 6.9 **CEC:** 14.6
P: above opt **K:** above opt
Mn: high **B:** low
Added N: 135 lbs.
Prev Crop: Soybeans

Rhizoc Level: Low
Cerc Control: See trts.
Problems: None
Seeding Rate: 4.1 inches
Rainfall: 21.6 inches
Beets/100 ft: ~180

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

No.	Treatment*	Sticker	# Applic	% Leafspot Damage 18-Sep	% Leafspot Damage 7-Sep	Net $/A	RWSA	RWST	T/A	% SUC
47	Super Tin	Reguard	5	**0.1 n**	**0.2 k**	**$1,218 ab**	**7099 abc**	**228 a-g**	**31.1 a**	**15.6 abc**
48	Super Tin	Reguard Diligence	5	**0.7 n**	**0.2 k**	**$1,195 a-d**	**7051 a-d**	**229 a-f**	**30.7 abc**	**15.6 abc**
50	Super Tin	Cide Winder	5	**1.6 n**	**0.3 k**	**$1,550 a-f**	**6643 a-h**	220 c-l	**30.1 a-d**	**15.2 a-i**
52	Super Tin	Liberate	5	**1.7 n**	**0.2 k**	**$1,172 a-e**	**6762 a-g**	**230 a-f**	**29.4 a-f**	**15.7 abc**
51	Super Tin	LI 700	5	**2.3 n**	**0.2 k**	**$1,135 a-h**	**6563 a-i**	**227 a-h**	**28.9 a-h**	**15.4 a-f**
46	Super Tin	Masterlock	5	**2.3 n**	**0.2 k**	**$1,136 a-h**	**6595 a-i**	**225 a-j**	**29.3 a-g**	**15.4 a-g**
49	Super Tin	Coron 25-0-0 Cide Winder	5	**2.7 n**	**0.3 k**	**$1,142 a-g**	**6702 a-h**	**232 a-d**	**28.9 a-h**	**15.6 a-d**
53	Super Tin	Wet Sol 99	5	**4.7 n**	**2.3 jk**	**$1,123 a-i**	**6490 a-j**	**234 abc**	**27.7 a-h**	**15.9 ab**
54	Super Tin	No Sticker	5	**10.0 mn**	**0.4 k**	**$1,217 abc**	**6952 a-f**	**236 ab**	**29.5 a-f**	**15.9 ab**
11	EBDC (7 Day)	Reguard Diligence	7	**0.6 n**	**0.1 k**	**$1,117 a-i**	**6688 a-h**	**226 a-i**	**29.7 a-f**	**15.4 a-e**
12	EBDC (7 Day)	Reguard	7	**0.8 n**	**0.1 k**	**$1,071 a-j**	**6551 a-i**	**231 a-e**	**28.4 a-h**	**15.6 abc**
15	EBDC (7 Day)	LI 700	7	**1.2 n**	**0.1 k**	$1,018 e-m	**6511 a-j**	218 d-n	**27.7 a-h**	15.0 b-m
10	EBDC (7 Day)	Masterlock	7	**1.2 n**	**0.1 k**	$1,052 b-l	**6252 a-m**	**228 a-g**	**27.4 a-h**	14.9 c-m
14	EBDC (7 Day)	Cide Winder	7	**2.6 n**	**0.1 k**	$1,034 d-l	6119 b-n	223 b-k	**27.5 a-h**	**15.2 a-j**
18	EBDC (7 Day)	No Sticker	7	**3.0 n**	**0.1 k**	**$1,160 a-f**	**6716 a-h**	**227 a-h**	**29.6 a-f**	**15.4 a-e**
16	EBDC (7 Day)	Liberate	7	**3.0 n**	**0.1 k**	**$1,233 a**	**7207 a**	**239 a**	**30.2 a-d**	**16.0 a**
13	EBDC (7 Day)	Coron 25-0-0 Cide Winder	7	**4.0 n**	**0.1 k**	**$1,193 a-d**	**7129 ab**	**231 a-e**	**30.8 ab**	**15.6 a-d**
17	EBDC (7 Day)	Wet Sol 99	7	**5.5 n**	**0.4 k**	**$1,094 a-j**	**6433 a-k**	**226 a-j**	**28.5 a-h**	**15.4 a-e**
21	EBDC (10 day)	Reguard Diligence	6	**14.3 k-n**	**2.6 ijk**	**$1,081 a-j**	**6414 a-l**	**225 a-k**	**28.6 a-h**	**15.3 a-g**
19	EBDC (10 Day)	Masterlock	6	**15.7 j-n**	**1.9 jk**	**$1,216 abc**	**6988 a-e**	224 b-k	**31.2 a**	15.1 b-l
24	EBDC (10 Day)	LI 700	6	23.5 h-m	**1.9 jk**	**$1,114 a-i**	**6396 a-l**	213 h-o	**30.1 a-d**	14.7 e-n
27	EBDC (10 day)	No Sticker	6	23.7 h-m	**1.5 jk**	**$1,067 a-j**	6074 c-n	219 d-m	**27.8 a-h**	14.9 c-m
22	EBDC (10 Day)	Coron 25-0-0 Cide Winder	6	28.3 f-k	**5.2 g-k**	$992 f-n	**6329 a-l**	223 b-k	26.3 d-h	15.1 b-k
20	EBDC (10 Day)	Reguard	6	29.5 f-j	**6.0 f-k**	$1,033 d-l	6053 c-n	214 g-o	**28.3 a-h**	14.7 d-n
26	EBDC (10 Day)	Wet Sol 99	6	34.2 d-i	**1.0 jk**	$1,030 d-m	5923 f-n	213 h-o	**27.8 a-h**	14.6 e-n
25	EBDC (10 Day)	Liberate	6	35.8 d-h	**1.8 jk**	$1,044 d-l	6014 d-n	212 i-o	**28.3 a-h**	14.5 f-n
23	EBDC (10 Day)	Cide Winder	6	39.2 b-g	**8.3 d-k**	**$1,100 a-j**	6318 a-l	223 b-k	**28.3 a-h**	15.1 b-j

* All treatments were sprayed with a maintenance spray of Badge @ 2pt/A and Masterlock @ 6.4 fl oz/A on 9/18

Evaluate Sticker / Spreaders added to Fungicides for *Cercospora beticola* and *Alternaria alternata* Leafspot Control in Sugarbeets

Laker Agronomy Field, Elkton, MI - 2018

No.	Treatment*	Sticker	# Applic	% Leafspot Damage 18-Sep	% Leafspot Damage 7-Sep	Net $/A	RWSA	RWST	T/A	% SUC
30	EBDC (13 Day)	Reguard Diligence	5	30.0 f-j	9.0 d-j	$969 h-n	5718 g-n	207 l-o	**27.6 a-h**	14.3 j-n
34	EBDC (13 Day)	Liberate	5	32.5 e-i	**7.5 e-k**	$996 f-n	5698 h-n	210 k-o	**27.1 a-h**	14.4 h-n
31	EBDC (13 Day)	Coron 25-0-0 Cide Winder	5	37.5 c-h	13.2 c-g	$887 k-n	5208 mn	204 no	25.6 fgh	14.2 mn
33	EBDC (13 Day)	LI 700	5	38.3 c-h	10.7 d-i	$968 h-n	5545 i-n	215 f-o	25.8 e-h	14.7 d-n
36	EBDC (13 Day)	No Sticker	5	39.2 b-g	12.2 c-g	$1,056 b-k	5973 e-n	211 j-o	**28.3 a-h**	14.6 e-n
29	EBDC (13 Day)	Reguard	5	39.2 d-g	**6.3 f-k**	$976 g-n	5676 h-n	212 i-o	26.8 b-h	14.5 g-n
32	EBDC (13 Day)	Cide Winder	5	42.5 b-f	9.2 d-j	$954 i-n	5473 j-n	213 h-o	25.7 e-h	14.6 e-n
28	EBDC (13 Day)	Masterlock	5	57.5 a	13.7 c-f	$880 lmn	5794 g-n	205 mno	24.8 h	14.2 k-n
35	EBDC (13 Day)	Wet Sol 99	5	57.9 a	18.8 bc	$935 j-n	5361 lmn	212 h-o	25.2 gh	14.5 f-n
43	Copper	Liberate	8	**13.0 lmn**	**8.3 d-k**	$972 g-n	5846 g-n	217 e-n	26.9 b-h	14.8 c-m
44	Copper	Wet Sol 99	8	20.2 i-m	**4.0 h-k**	$847 n	5153 n	207 l-o	24.9 h	14.2 lmn
45	Copper	No Sticker	8	24.8 g-l	**8.3 d-k**	$933 j-n	5542 i-n	214 g-o	25.9 e-h	14.8 c-n
37	Copper	Masterlock	8	31.7 e-i	12.3 c-g	**$1,084 a-j**	**6500 a-j**	226 a-i	**28.8 a-h**	**15.2 a-h**
38	Copper	Reguard	8	32.8 e-i	11.5 c-h	$941 j-n	5794 g-n	217 e-n	26.6 c-h	14.8 c-n
39	Copper	Reguard Diligence	8	35.8 d-h	16.0 cd	$955 i-n	5983 e-n	212 i-o	**28.2 a-h**	14.7 e-n
40	Copper	Coron 25-0-0 Cide Winder	8	36.7 d-h	15.2 cde	$862 mn	5387 k-n	201 o	26.8 b-h	14.0 n
42	Copper	LI 700	8	40.0 b-g	**8.3 d-k**	$937 j-n	5657 h-n	213 h-o	26.5 d-h	14.6 e-n
41	Copper	Cide Winder	8	40.0 b-g	12.3 c-g	$997 f-n	5988 e-n	213 h-o	**28.1 a-h**	14.6 e-n
2	Triazole	Reguard	5	26.0 g-l	**3.4 h-k**	$1,062 b-j	**6422 a-k**	222 b-l	**28.9 a-h**	15.1 b-l
6	Triazole	LI 700	5	46.7 a-e	15.3 cde	$966 h-n	5813 g-n	211 j-o	**27.5 a-h**	14.4 i-n
4	Triazole	Coron 25-0-0 Cide Winder	5	47.1 a-e	25.0 ab	$974 h-r	5964 e-n	215 f-o	**27.7 a-h**	14.8 c-m
3	Triazole	Reguard Diligence	5	47.1 a-e	12.3 c-g	$1,020 e-m	**6276 a-l**	220 c-m	**28.6 a-h**	15.0 b-m
7	Triazole	Liberate	5	49.6 a-d	30.8 a	$958 i-n	5771 g-n	218 d-n	26.5 d-h	14.9 c-m
5	Triazole	Cide Winder	5	49.6 a-d	23.5 ab	$1,042 d-l	**6231 a-m**	211 j-o	**29.5 a-f**	14.4 h-n
1	Triazole	Masterlock	5	49.6 a-d	13.0 c-g	$1,047 c-l	**6287 a-l**	210 k-o	**29.9 a-e**	14.4 h-n
9	Triazole	No Sticker	5	52.1 abc	24.8 ab	$993 f-n	5911 f-n	218 d-n	**27.2 a-h**	15.0 c-m
8	Triazole	Wet Sol 99	5	54.2 ab	27.0 a	$955 i-n	5748 g-n	216 f-n	26.6 c-h	14.8 c-m

Average	25.26	7.55	1042.7	6179.4	219.0	28.04	14.95
LSD 5%	12.56	6.72	136.6	839.7	11.8	3.3	0.70
CV	30.7	54.9	8.1	8.4	3.3	7.2	2.9

Means followed by the same letter are not significantly different. Duncans New MRT 5%.

* All treatments were sprayed with a maintenance spray of Badge @ 2pt/A and Masterlock @ 6.4 fl oz/A on 9/18

Net $/A: Assume a $40 beet payment and trial average RWST with fungicide costs subtracted off.
Bold: Results are not statistically different from top-ranking treatment in each column.

Effect of Fungicide Program

No.	Treatment	% Leafspot Damage 18-Sep	% Leafspot Damage 7-Sep	Net $/A	RWSA	RWST	T/A	% SUC	% CJP
2	EBDC (7 Day)	**2.4 d**	**0.2 d**	$1,108 b	**6623 ab**	**228 a**	**28.9 ab**	**15.4 a**	96.1
6	Super Tin	**2.9 d**	**0.5 d**	**$1,165 a**	**6762 a**	**229 a**	**29.5 a**	**15.6 a**	96.1
3	EBDC (10 Day)	27.1 c	3.4 c	$1,075 b	6279 bc	218 b	**28.5 ab**	14.9 b	96.1
5	Copper	30.6 c	10.7 b	$948 c	5761 de	213 bc	27.0 cd	14.6 bc	96.0
4	EBDC (13 Day)	41.6 b	11.2 b	$958 c	5605 e	210 c	26.3 d	14.4 c	96.0
1	Triazole	46.9 a	19.5 a	$1,002 c	6047 cd	216 b	28.0 bc	14.8 b	96.1
Average		25.26	7.55	$1,042.7	6179.4	219.0	28.04	14.95	96.04
LSD 5%		4.57	2.70	56.4	348.0	5.7	1.39	0.29	n.s.
CV %		29.8	59.0	8.9	9.3	4.3	8.2	3.2	0.5

Effect of Spreader / Sticker

No.	Treatment	% Leafspot Damage 18-Sep	% Leafspot Damage 7-Sep	Net $/A	RWSA	RWST	T/A	% SUC	% CJP
2	Reguard	**21.4 b**	**4.6 d**	$1,058	6289	220	28.6	15.0	96.0
3	Reguard Diligence	**21.5 b**	**6.7 bcd**	$1,049	6332	221	28.7	15.1	96.0
7	Liberate	**22.6 b**	8.1 abc	$1,062	6216	221	28.1	15.0	96.1
6	LI 700	**25.3 ab**	**6.1 cd**	$1,023	6081	216	27.8	14.8	95.9
9	No Sticker	**25.5 ab**	7.9 abc	$1,071	6195	221	28.0	15.1	96.2
4	Coron 25-0-0 Cide Winder	**26.0 ab**	9.8 a	$1,008	6120	218	27.7	14.9	96.1
1	Masterlock	**26.3 ab**	**6.9 bcd**	$1,069	6402	220	28.6	14.9	96.0
5	Cide Winder	29.2 a	9.0 ab	$1,046	6129	217	28.2	14.9	96.0
8	Wet-Sol 99	29.4 a	8.9 ab	$997	5851	218	26.8	14.9	95.9
Average		25.26	7.55	$1,042.7	6179.4	219.0	28.04	14.95	96.04
LSD 5%		5.13	2.74	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.
CV%		30.7	54.9	8.1	8.4	3.3	7.2	2.9	0.6

Means followed by the same letter are not significantly different. Duncans New MRT 5%.

Comments: Reguard, Reguard + Diligence and Liberate appeared to improve fungicidal efficacy. LI 700, Coron 25-0-0, Masterlock, Cide Winder and Wet-Sol 99 did not improve fungicidal activity. None of the stickers extended the fungicidal activity of an EBDC treatment. Cercospora (*Cercospora beticola*) and Alternaria (*Alternaria alternata*) leafspot pressure was very high.

Net $/A: Assume a $40 beet payment and trial average RWST with fungicide costs subtracted off.
Bold: Results are not statistically different from top-ranking treatment in each column.

Evaluate Sticker / Spreaders added to Fungicides for *Cercospora beticola* and *Alternaria alternata* Leafspot Control in Sugarbeets

Laker Agronomy Field, Elkton, MI - 2018

No.	Program	Sticker	Treatment	# App	Date
1	Triazole	Masterlock	Inspire + Manzate	3	7/12, 8/7, 9/7
			Manzate	2	7/27, 8/28
2	Triazole	Reguard	Inspire + Manzate	3	7/12, 8/7, 9/7
			Manzate	2	7/27, 8/28
3	Triazole	Reguard + Diligence	Inspire + Manzate	3	7/12, 8/7, 9/7
			Manzate	2	7/27, 8/28
4	Triazole	Coron 25-0-0 + Cidewinder	Inspire + Manzate	3	7/12, 8/7, 9/7
			Manzate	2	7/27, 8/28
5	Triazole	Cidewinder	Inspire + Manzate	3	7/12, 8/7, 9/7
			Manzate	2	7/27, 8/28
6	Triazole	LI 700	Inspire + Manzate	3	7/12, 8/7, 9/7
			Manzate	2	7/27, 8/28
7	Triazole	Liberate	Inspire + Manzate	3	7/12, 8/7, 9/7
			Manzate	2	7/27, 8/28
8	Triazole	Wet-Sol 99	Inspire + Manzate	3	7/12, 8/7, 9/7
			Manzate	2	7/27, 8/28
9	Triazole	No Sticker	Inspire + Manzate	3	7/12, 8/7, 9/7
			Manzate	2	7/27, 8/28
10	EBDC - (7 Day)	Masterlock	Manzate	7	7/12, 7/19, 7/25, 8/1 8/10, 8/18, 8/28
			Badge	1	9/4
11	EBDC - (7 Day)	Reguard	Manzate	7	7/12, 7/19, 7/25, 8/1 8/10, 8/18, 8/28
			Badge	1	9/4
12	EBDC - (7 Day)	Reguard + Diligence	Manzate	7	7/12, 7/19, 7/25, 8/1 8/10, 8/18, 8/28
			Badge	1	9/4
13	EBDC - (7 Day)	Coron 25-0-0 + Cidewinder	Manzate	7	7/12, 7/19, 7/25, 8/1 8/10, 8/18, 8/28
			Badge	1	9/4
14	EBDC - (7 Day)	Cidewinder	Manzate	7	7/12, 7/19, 7/25, 8/1 8/10, 8/18, 8/28
			Badge	1	9/4
15	EBDC - (7 Day)	LI 700	Manzate	7	7/12, 7/19, 7/25, 8/1 8/10, 8/18, 8/28
			Badge	1	9/4
16	EBDC - (7 Day)	Liberate	Manzate	7	7/12, 7/19, 7/25, 8/1 8/10, 8/18, 8/28
			Badge	1	9/4
17	EBDC - (7 Day)	Wet-Sol 99	Manzate	7	7/12, 7/19, 7/25, 8/1 8/10, 8/18, 8/28
			Badge	1	6/4
18	EBDC - (7 Day)	No Sticker	Manzate	7	7/12, 7/19, 7/25, 8/1 8/10, 8/18, 8/28
			Badge	1	9/4
19	EBDC - (10 Day)	Masterlock	Manzate	6	7/12, 7/23, 8/2, 8/13 8/28, 9/7
20	EBDC - (10 Day)	Reguard	Manzate	6	7/12, 7/23, 8/2, 8/13 8/28, 9/7

Evaluate Sticker / Spreaders added to Fungicides for *Cercospora beticola* and *Alternaria alternata* Leafspot Control in Sugarbeets

Laker Agronomy Field, Elkton, MI - 2018

No.	Program	Sticker	Treatment	# App	Date
21	EBDC - (10 Day)	Reguard + Diligence	Manzate	6	7/12, 7/23, 8/2, 8/13 8/28, 9/7
22	EBDC - (10 Day)	Coron 25-0-0 + Cidewinder	Manzate	6	7/12, 7/23, 8/2, 8/13 8/28, 9/7
23	EBDC - (10 Day)	Cidewinder	Manzate	6	7/12, 7/23, 8/2, 8/13 8/28, 9/7
24	EBDC - (10 Day)	LI 700	Manzate	6	7/12, 7/23, 8/2, 8/13 8/28, 9/7
25	EBDC - (10 Day)	Liberate	Manzate	6	7/12, 7/23, 8/2, 8/13 8/28, 9/7
26	EBDC - (10 Day)	Wet-Sol 99	Manzate	6	7/12, 7/23, 8/2, 8/13 8/28, 9/7
27	EBDC - (10 Day)	No Sticker	Manzate	6	7/12, 7/23, 8/2, 8/13 8/28, 9/7
28	EBDC - (13 Day)	Masterlock	Manzate	5	7/12, 7/25, 8/7 8/20, 9/4
29	EBDC - (13 Day)	Reguard	Manzate	5	7/12, 7/25, 8/7 8/20, 9/4
30	EBDC - (13 Day)	Reguard + Diligence	Manzate	5	7/12, 7/25, 8/7 8/20, 9/4
31	EBDC - (13 Day)	Coron 25-0-0 + Cidewinder	Manzate	5	7/12, 7/25, 8/7 8/20, 9/4
32	EBDC - (13 Day)	Cidewinder	Manzate	5	7/12, 7/25, 8/7 8/20, 9/4
33	EBDC - (13 Day)	LI 700	Manzate	5	7/12, 7/25, 8/7 8/20, 9/4
34	EBDC - (13 Day)	Liberate	Manzate	5	7/12, 7/25, 8/7 8/20, 9/4
35	EBDC - (13 Day)	Wet-Sol 99	Manzate	5	7/12, 7/25, 8/7 8/20, 9/4
36	EBDC - (13 Day)	No Sticker	Manzate	5	7/12, 7/25, 8/7 8/20, 9/4
37	Copper	Masterlock	Badge	8	7/12, 7/19, 7/25, 8/1 8/10, 8/18, 8/28, 9/4
38	Copper	Reguard	Badge	8	7/12, 7/19, 7/25, 8/1 8/10, 8/18, 8/28, 9/4
39	Copper	Reguard + Diligence	Badge	8	7/12, 7/19, 7/25, 8/1 8/10, 8/18, 8/28, 9/4
40	Copper	Coron 25-0-0 + Cidewinder	Badge	8	7/12, 7/19, 7/25, 8/1 8/10, 8/18, 8/28, 9/4

Evaluate Sticker / Spreaders added to Fungicides for *Cercospora beticola* and *Alternaria alternata* Leafspot Control in Sugarbeets

Laker Agronomy Field, Elkton, MI - 2018

No.	Program	Sticker	Treatment	# App	Date
41	Copper	Cidewinder	Badge	8	7/12, 7/19, 7/25, 8/1 8/10, 8/18, 8/28, 9/4
42	Copper	LI 700	Badge	8	7/12, 7/19, 7/25, 8/1 8/10, 8/18, 8/28, 9/4
43	Copper	Liberate	Badge	8	7/12, 7/19, 7/25, 8/1 8/10, 8/18, 8/28, 9/4
44	Copper	Wet-Sol 99	Badge	8	7/12, 7/19, 7/25, 8/1 8/10, 8/18, 8/28, 9/4
45	Copper	No Sticker	Badge	8	7/12, 7/19, 7/25, 8/1 8/10, 8/18, 8/28, 9/4
46	Super Tin	Masterlock	Super Tin + Manzate Manzate	3 2	7/12, 8/4, 8/30 7/25, 8/18
47	Super Tin	Reguard	Super Tin + Manzate Manzate	3 2	7/12, 8/4, 8/30 7/25, 8/18
48	Super Tin	Reguard + Diligence	Super Tin + Manzate Manzate	3 2	7/12, 8/4, 8/30 7/25, 8/18
49	Super Tin	Coron 25-0-0 + Cidewinder	Super Tin + Manzate Manzate	3 2	7/12, 8/4, 8/30 7/25, 8/18
50	Super Tin	Cidewinder	Super Tin + Manzate Manzate	3 2	7/12, 8/4, 8/30 7/25, 8/18
51	Super Tin	LI 700	Super Tin + Manzate Manzate	3 2	7/12, 8/4, 8/30 7/25, 8/18
52	Super Tin	Liberate	Super Tin + Manzate Manzate	3 2	7/12, 8/4, 8/30 7/25, 8/18
53	Super Tin	Wet-Sol 99	Super Tin + Manzate Manzate	3 2	7/12, 8/4, 8/30 7/25, 8/18
54	Super Tin	No Sticker	Super Tin + Manzate Manzate	3 2	7/12, 8/4, 8/30 7/25, 8/18

Effect of Copper / Roundup Applications on Sugarbeet Leaf Injury
Laker Agronomy Field, Elkton, MI - 2018

Trial Quality: Good
Variety: C-G333NT
Planted: May 2
Harvested: Oct 17
Plots: 6 rows X 38 ft, 6 reps
Row Spacing: 22 inches

Soil Info: Loam
% OM: 2.5 **pH:** 6.9 **CEC:** 14.6
P: above opt **K:** above opt
Mn: high **B:** low
Added N: 135 lbs
Prev Crop: Soybeans

Rhizoc Level: Low
Leafspot Control: N.A.
Problems:
Seeding Rate: 4.1 inches
Rainfall: 21.6 inches
Beets/100 ft: ~162

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

No.	Treatment*	Badge Applic Timing	Rate/A	Phyto %	
				2-Aug	
1	Roundup P Max + AMS, no Badge	0 Day - July 10th	32 fl oz + 17 lbs.	**4.2**	**e**
12	Badge SC + Masterlock	12 Days After Roundup	2 pt + 6.4 fl oz.	**6.7**	**de**
11	Badge SC + Masterlock	9 Days After Roundup	2 pt + 6.4 fl oz.	**10.0**	**cde**
10	Badge SC + Masterlock	6 Days After Roundup	2 pt + 6.4 fl oz.	12.5	bcd
7	Badge SC + Masterlock	12 Days Before Roundup	2 pt + 6.4 fl oz.	12.5	bcd
6	Badge SC + Masterlock	9 Days Before Roundup	2 pt + 6.4 fl oz.	12.5	bcd
5	Badge SC + Masterlock	6 Days Before Roundup	2 pt + 6.4 fl oz.	12.5	bcd
9	Badge SC + Masterlock	3 Days After Roundup	2 pt + 6.4 fl oz.	13.3	bcd
8	Badge SC + Masterlock	1 Day After Roundup	2 pt + 6.4 fl oz.	15.0	bcd
4	Badge SC + Masterlock	3 Days Before Roundup	2 pt + 6.4 fl oz.	15.8	abc
3	Badge SC + Masterlock	1 Day Before Roundup	2 pt + 6.4 fl oz.	17.5	ab
2	Badge SC + Masterlock	Same day as Roundup	2 pt + 6.4 fl oz.	21.7	a

Average	12.85
LSD: 5%	5.84
CV %	39.3

Means followed by the same letter are not significantly different. Duncans New MRT 5%.
*All Treatments were sprayed with a maintenance spray of Badge @ 2 pt/A and Masterlock @ 6.4 fl oz/A on 8/18, 8/30 and 9/18.

Comments: This trial was conducted to determine the effect of Roundup and Badge applications on sugarbeet leaf injury. Badge was applied the same day as Roundup, 1, 3, 6, 9 and 12 days before Roundup and 1, 3, 6, 9 and 12 days after Roundup. AMS was included in the Roundup application and Masterlock was included in the Badge applications. In general, it appeared that Badge applications were safer to sugarbeets when the spray interval between Roundup and Badge was 6 or more days. Treatment rankings (safest to most injuries) were: Badge applied 12 days after Roundup, 9 days after, 6 days after, 12 days before, 9 days before, 6 days before, 3 days after, 1 day after, 3 days before, 1 day before and when Badge and Roundup were applied on the same day. It appeared that Badge applied after Roundup was safer than Badge applied before Roundup.

Net $/A: Assume a $40 beet payment and trial average RWST with fungicide costs subtracted off.
Bold: Results are not statistically different from top-ranking treatment in each column.

Cercospora leaf spot: cultivar and fungicide program, Ridgetown, 2018
Ridgetown, Ontario, Canada
Cheryl Trueman, University of Guelph, Ridgetown Campus, Ridgetown, ON

Trial Quality:	Good	**Variety:**	B-1399, C-RR059, C-G333NT
Planted:	May 2	**Location:**	Ridgetown, Ontario, Canada
Harvested:	October 22	**Application Method:**	hand-held boom, CO_2 pressure
Plot Size:	2 rows x 23 feet	**Application Water Volume:**	25 gal/A except where indicated
Row Spacing:	2.5 feet	**Reps:**	4
Seeding Rate:	3.5 seeds/foot		

Highlights:

- Table 1: Disease severity was high. Harvest delays due to poor weather resulted in a six-week gap from the time of the last fungicide application to harvest.
    - The MSC 'moderate' and 'susceptible' programs reduced AUDPS more than Manzate Pro-Stick programs. RWSA was higher for MSC 'susceptible' program than the nontreated control, Manzate Pro-Stick beginning at 40 DSVs, and Manzate Pro-Stick beginning at 50 DSVs with low water volume. These results differed from 2017 when we saw no advantage of the MSC programs over Manzate Pro-Stick programs. This may be because disease established earlier in 2018 and there was a delayed harvest.
    - The lowest number of fungicide applications was with Manzate Pro-Stick beginning at 40 DSVs, 50 DSVs (high and low water volume), and the MSC 'tolerant' program. Among these, the MSC 'tolerant' program and Manzate Pro-Stick beginning at 50 DSVs with high water volume were equivalent for AUDPS, yield, sugar, RWST, and RWSA. Thus, these programs may be adequate and use of appropriate water volume is beneficial. We also observed benefits from water volume (25 vs. 12 gpa) in 2017.
- Table 2: Interestingly, disease severity in C-RR059 was higher than B-1399 and C-G333NT. To the best of our knowledge, only Cercospora leaf spot was present in the trial, but through September and October disease intensity was high and so it is possible other pathogens were present. Sugar and RWST were also higher in C-RR059 than B-1399 and C-G333NT. This compensated for the beet yield reduction in C-RR059 and there was no difference in RWSA among cultivars. High sugar in C-RR059 was also noted in 2017.

Acknowledgements: This project was funded in part through the Canadian Agricultural Partnership (the Partnership), a federal-provincial-territorial initiative. The Agricultural Adaptation Council assists in the delivery of the Partnership in Ontario. We also thank the Ontario Sugarbeet Growers' Association (OSGA) and the Michigan Sugar Company (MSC) for financial support.

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Table 1. Disease severity (% leaf area affected), area under the disease progress stairs (AUDPS), yield, and sugar in three sugar beet cultivars (B-1399, C-RR059, C-G333NT) grown under eight different fungicide schedules for management of Cercospora leaf spot, Ridgetown, ON, 2018.

Schedule (carrier volume) (# applications)	Severity (%) – Sept 19	AUDPS [a]	Yield (tons/acre)	Sugar (%)	RWST	RWSA
Unsprayed control	96 a	2819 a	29.4 b	13.6 d	193.8 e	5698 c
Manzate Pro-Stick, begin 50 DSV (12 gpa) (7)	**52 b**	**1386 b**	31.5 ab	**14.3 c**	**206.4 d**	6479 bc
Manzate Pro-Stick, begin 50 DSV (25 gpa) (7)	**43 bc**	**1160 bc**	33.3 ab	**14.7 bc**	**212.0 bcd**	**7029 ab**
Manzate Pro-Stick, begin 40 DSV (25 gpa) (7)	59 ab	**1562 b**	32.0 ab	**14.4 c**	**208.1 cd**	6640 bc
Manzate Pro-Stick, begin 35 DSV (25 gpa) (8)	**41 bc**	**1078 bc**	34.1 ab	**14.7 bc**	**212.9 bcd**	**7252 ab**
MSC 'tolerant cultivar' program (25 gpa) (7)	**25 cd**	**667 cd**	34.5 ab	**15.0 ab**	**217.7 abc**	**7487 ab**
MSC 'moderate cultivar' program (25 gpa) (9)	**16 de**	**435 de**	**35.0 a**	**15.3 ab**	**221.6 ab**	**7715 ab**
MSC 'susceptible cultivar' program (25 gpa) (11)	**11 e**	**301 e**	**35.1 a**	**15.5 a**	**226.4 a**	**7911 a**

[a] AUDPS = area under the disease progress stairs. A lower number is better.[b] Manzate Pro-Stick programs began at the BEETcast™ DSV threshold indicated and were applied approximately every 14 days. MSC Canada-adapted programs were as follows: 'tolerant' 1) Proline + Manzate Pro-Stick at 50 DSV, 2) Manzate Pro-Stick at 45 DSV or 21 days, 3) Proline + Manzate Pro-Stick at 35 DSV or 14 days, 4) Manzate Pro-Stick at 35 DSV or 14 days, 5+) Manzate Pro-Stick 21 DSV or 10 days, 'moderate' 1) Proline + Manzate Pro-Stick at 40 DSV, 2) Manzate Pro-Stick at 40 DSV or 18 days, 3) Proline + Manzate Pro-Stick at 25 DSV or 14 days, 4) Manzate Pro-Stick at 25 DSV or 14 days, 5+) Manzate Pro-Stick 18 DSV or 10 days, 'susceptible' 1) Proline + Manzate Pro-Stick at 35 DSV, 2) Manzate Pro-Stick at 35 DSV or 15 days, 3) Proline + Manzate Pro-Stick at 20 DSV or 12 days, 4) Manzate Pro-Stick at 20 DSV or 12 days, 5+) Manzate Pro-Stick 15 DSV or 10 days. For MSC Canada-adapted programs, where both DSV and number of days are listed, the fungicide was applied according to the criteria that was reached first. [c] Numbers in a column followed by the same letter are not significantly different at $P \leq 0.05$, Tukey's HSD. Data from different cultivars was pooled because of no significant program x cultivar interaction.

Table 2. Area under the disease progress stairs (AUDPS), yield, and sugar in three sugar beet cultivars grown under eight different fungicide schedules for management of Cercospora leaf spot, Trial 1, Ridgetown, ON, 2018.

Cultivar	Severity (%) – Sept 19	AUDPS [a]	Yield (tons/acre)	% Sugar	RWST	RWSA
B-1399	**32 b**	**847.35 b**	**34.0 a**	**14.6 b**	**211.1 b**	7171 a
C-G333NT	**30 b**	**831.59 b**	**34.7 a**	**14.3 c**	**206.0 c**	7180 a
C-RR059	**46 a**	**1218.65 a**	**30.7 b**	**15.2 a**	**220.0 a**	6728 a

[a] AUDPS = area under the disease progress stairs. A lower number is better. [b] Numbers in a column followed by the same letter are not significantly different at $P \leq 0.05$, Tukey's adjustment. Data from three sugarbeet cultivars was pooled because of not program x cultivar interaction.

Cercospora leaf spot: deposition aids and carrier volume, Ridgetown, 2018

Ridgetown, Ontario, Canada
Cheryl Trueman, University of Guelph, Ridgetown Campus, Ridgetown, ON

Trial Quality:	Very good	**Variety:**	C-RR059
Planted:	May 2	**Location:**	Ridgetown, Ontario, Canada
Harvested:	October 19	**Application Method:**	hand-held boom, CO_2 pressure
Plot Size:	2 rows x 23 feet	**Application Water Volume:**	See table
Row Spacing:	2.5 feet	**Reps:**	4
Seeding Rate:	3.5 seeds/foot		

Highlights:

- Cercospora leaf spot severity was very high. Burn down was visible in all plots by early September but the trial was not harvested until October 19 due to poor weather.
- Programs that included Manzate Pro-Stick had lower disease severity and higher percent sugar than those treated with water only or Interlock only. The addition of Interlock to Manzate Pro-Stick did not reduce disease or increase sugar content more than applications of Manzate Pro-Stick alone.
- There was no effect of water volume on program response.

Table 1. Cercospora leaf spot severity (% leaf area affected), area under the disease progress stairs (AUDPS), yield, and sugar quality in 'C-RR059' managed using Manzate Pro-Stick fungicide with or without the deposition aid Interlock at different carrier volumes, Ridgetown, ON, 2018.

Factor [a]	Severity (%) Oct 9	AUDPS [b]	Yield (tons/acre)	Sugar (%)	RWST	RWSA
Program						
Water	96 a [c]	5198 a	26.4 a	12.8 b	181 ab	4842 ab
Interlock	95 a	5366 a	25.9 a	12.5 b	176 b	4538 b
Manzate Pro-Stick	**90 b**	**4504 b**	30.7 a	**13.4 a**	190 a	5845 a
Manzate Pro-Stick + Interlock	**90 b**	**4379 b**	28.4 a	**13.4 a**	190 a	5426 ab
Carrier volume (gpa)						
12	93 a	4978 a	28.1 a	13.0 a	184 a	5158 a
25	92 a	4804 a	27.9 a	13.0 a	183 a	5214 a
38	92 a	4773 a	27.7 a	13.2 a	186 a	5194 a
50	94 a	4891 a	27.7 a	13.0 a	183 a	5085 a

[a] Treatments were applied on June 19, July 3, 17, 31, Aug 14, 28, and Sept 14. [b] AUDPS = area under the disease progress stairs. A lower number is better. [c] Numbers in a column followed by the same letter are not significantly different at $P \leq 0.05$, Tukey's adjustment. Data from different application carrier volumes and programs was pooled because the response for program was the same at different carrier volumes and response for carrier volume was the same with different programs.

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MICHIGAN STATE UNIVERSITY EXTENSION

Michigan State University AgBioResearch

Evaluation of foliar fungicide treatments to manage Cercospora leaf spot of sugar beet

Jaime Willbur and Chris Bloomingdale, Michigan State University

Location: Frankenmuth (SVREC)	**Treatment Timings:** 14 day interval starting at 45 DSV
Planting Dates: April 30, 2018	**Pesticides:** see table
Soil Type: Loam	**O.M.:** 5.0 **pH:** 7.5
Replicates: 4	**Variety:** C-G351NT

Summary: Mean CLS ratings were significantly different among treatments (P<0.0001). Programs 1-7 provided the greatest level of plant protection, with a mean disease severity ranging from 4.3-5.0, which is below the economic threshold of 6. Disease levels in programs 17-19 were not significantly different from the non-treated control, and had disease severity range of 7.5-8.0. Significant differences among program yields were detected (P=0.01). Though numerically many programs had mean yields greater than the control plot (18.7 t/A), programs 3, 5, and 8 were the only programs with mean yields significantly greater than the control. Significant differences were found among treatments for percent sugar (P<0.0001) and RWST values (P<0.001). The greatest percent sugar values resulted from programs 1, 3, 4, and 6, with a range of 13.9-14.6%. RWST values were greatest in programs 1-8, and had mean values of 191.9-205.3 lb sugar/ton of beet. The lowest percent sugar and RWST means resulted from programs 15-20. It is noted that lower than normal yields, percent sugar, and RWST values are most likely due to the early harvest and stand establishment issues. Overall, the top three performing programs were numbers 2, 3, and 8.

See next page for data table.

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Soil Type: Loam	**O.M.:** 5.0 **pH:** 7.5
Replicates: 4	**Variety:** C-G351NT

Table 1. End of season disease severity and yield parameters from the tested fungicide programs.

No.	Treatment, Rate/A, and Timing[a]	Disease Severity[b,c]	Yield (t/A)	Sugar (%)	RWST
1	Minerva Duo (16 fl oz) ACDF + Super Tin (8 fl oz) BE + Koverall (1.5 lbs) BE	4.3 e	21.7 a-e	14.1 a-c	199.0 ab
2	Manzate Max (1.6 qt) ABCDEF + Inspire XT (7 fl oz) AC + Super Tin (8 fl oz) BD	4.5 de	22.0 a-e	13.8 b-d	192.3 a-d
3	Manzate Max (1.6 qt) ABCDEF + Acropolis (32 fl oz) AC + Super Tin (8 fl oz) BD	4.5 de	23.3 a	14.6 a	205.3 a
4	Inspire XT (7 fl oz) A + Manzate Max (1.6 qt) ABCDF + Super Tin (8 fl oz) C + Cuprofix Ultra (3 lb) E	4.7 de	22.5 a-d	13.9 a-d	193.6 a-c
5	Manzate Max (1.6 qt) ABCDEF + Inspire XT (7 fl oz) AC + MasterCop (1.5 pt) BCD + Super Tin (8 fl oz) BD	4.8 de	23.2 ab	13.6 b-f	191.9 a-e
6	Manzate Max (1.6 qt) ABCDEF + Inspire XT (7 fl oz) AC + AgriLife (1 qt) BCD + Super Tin (8 fl oz) BD	4.8 de	19.4 d-g	14.5 a-b	204.6 a
7	Manzate Max (1.6 qt) ABCDEF + Inspire XT (7 fl oz) AC + Badge SC (2 pt) BCD + Super Tin (8 fl oz) BD	5.0 de	22.4 a-e	13.8 b-e	192.2 a-d
8	Super Tin (8 fl oz) A + Manzate Max (1.6 qt) ACF + Dexter Max (2.1 lb) BD + Inspire XT (7 fl oz) C + Cuprofix Ultra (3 lb) E	5.3 d	23.25 b	13.8 b-e	192.6 a-d
9	Super Tin (8 fl oz) A + Manzate Max (1.6 qt) ABCDF + Inspire XT (7 fl oz) C + Cuprofix Ultra (3 lb) E	5.3 d	20.3 b-g	13.3 d-f	183.5 c-e
10	Inspire XT (7 fl oz) A + Manzate Max (1.6 qt) ACF + Dexter Max (2.1 lb) BD + Super Tin (8 fl oz) C + Cuprofix Ultra (3 lb) E	5.3 d	20.7 b-g	13.3 d-f	183.2 c-e
11	Brixen (21 fl oz) AD + Super Tin (8 fl oz) BE + Koverall (1.5 lb) BE + Minerva Duo (16 fl oz) CF	5.3 d	19.6 a-g	13.5 c-f	188.1 b-e
12	Minerva (13 fl oz) AD + Super Tin (8 fl oz) BE + Koverall (1.5 lb) BE + Minerva Duo (16 fl oz) CF	5.3 d	21.3 b-f	13.6 c-e	189.4 b-e
13	Manzate Max (1.6 qt) ABDF + Inspire XT (7 fl oz) AB + LifeGard (4.5 oz/100gal) CE + Super Tin (8 fl oz) D	6.3 c	21.9 a-e	13.1 e-g	180.8 d-f
14	Manzate Max (1.6 qt) A + Badge SC (2 pt) BCDEF	6.5 c	22.7 a-d	13.6 c-e	189.3 b-e
15	Manzate Max (1.6 qt) A + MasterCop (1.5 pt) BCDEF	7.0 bc	19.1 e-g	12.5 gh	169.1 fg
16	Manzate Max (1.6 qt) A + AgriLife (1 qt) BCDEF	7.0 bc	18.3 fg	12.2 h	165.0 g
17	Double Nickel (1 qt) ABCDEF + Kocide 3000-O (1.5 lb) ABCDEF	7.5 ab	20.2 b-g	12.9 f-h	177.1 e-g
18	Experimental (1% v/v) ABCDEF	7.8 ab	19.5 d-g	12.2 h	166.7 g
19	LifeGard (4.5 oz/100 gal) ABCDEF	7.8 ab	17.6 g	12.4 gh	169.7 fg
20	Non-Treated Control	8.0 a	18.7 c-g	12.3 h	166.3 g

[a] Application letters code for the following dates: A=20 Jun, B=3 Jul, C=17 Jul, D=31 Jul, E=14 Aug, F=30 Aug.

[b] Disease severity based on a 0-10 scale with the following breakdown of leaf area: 1=0.1% (1-5 spots/leaf), 2=0.35% (6-12 spots/leaf), 3=0.75% (13-25 spots/leaf), 4=1.5% (26-50 spots/leaf), 5=2.5% (51-75 spots/leaf), 6=3%, 7=6%, 8=12% 9=25%, 10=50%.

[c] Column values followed by the same letter are not significantly different based on Fisher's Protected LSD (α=0.05); if no letter, then the effect is not significant

Sugarbeet (*Beta vulgaris*)
Cercospora leaf spot; *Cercospora beticola*

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In-vitro fungicide sensitivity of *Cercospora beticola* isolates from sugarbeet 2018

Cercospora leaf spot (CLS) caused by *Cercospora beticola* is the most serious foliar disease of sugarbeet in Michigan and when conditions are conducive can cause yield losses. The need to preserve the usefulness of existing fungicide chemistries has been particularly important since the development of fungicide insensitivity issues in CLS. Additionally, from 2013-2017, there has been a steady increase in frequency of *C. beticola* isolates with triazole and QoI resistance collected from commercial production fields in Michigan and Ontario, CA. Major issues have developed over the past few years with the introduction of effective fungicides for control of this disease related to fungicide application timing and development of insensitivity to established and novel fungicides in *C. beticola* populations. This has led to the increase in the development of insensitivity to some fungicides previously recommended for CLS management, most notably thiophanate-methyl, benzimidazoles and QoIs. Therefore, this project continued to monitor fungicide sensitivity of pathogen populations to inform the development of resistant management and fungicide use recommendations.

Sample collection and geographical origin of isolates: Isolates of *C. beticola* were collected from leaves with symptoms of CLS sampled from sugarbeet fields in east-central Michigan during Sep and Oct in 2018. Samples of up to 20 leaves from throughout a selection of sugarbeet production fields in Michigan and Ontario CA were used in sensitivity testing. Isolates of *C. beticola* were recovered from infected leaf tissue from multiple field locations using established methods. Pure cultures isolated from individual CLS lesions were obtained to determine sensitivity to each fungicide described below. Representative lesions were randomly selected from sugarbeet leaves, surfaced sterilized, and placed into plastic bags with moist paper towel to maintain humidity near 100 %, and placed under fluorescent light with an 8-h photo-period at 24°C for 7 d to promote sporulation. Hyphal tipping was used to isolate pure cultures of *C. beticola* onto clarified V8 (CV8) media amended with $CaCO_3$ (900 ml of distilled H_2O, 100 ml of CV8, 15 g of Bacto Agar, and 1.5 g of $CaCO_3$) for subsequent fungicide sensitivity assays.

In vitro fungicide sensitivity of *Cercospora beticola* by dilution gradient: Difenoconazole [DFZ; Inspire®, (Group 3)], fenbuconazloe [FBZ; Enable®, (Group 3)], flutriafol [FTL; Topguard®, (Group 3)], prothioconazole [PTZ; Proline®, (Group 3)], tetraconazole [TTZ; Eminent®125 SL, (Group 3)], pyraclostrobin [PYR; Headline® 2.08SC, (Group 11)], thiophanate-methyl [TPN; Topsin® 4.5FL (Group 1)] and triphenyltin OH [TPT; Super Tin® 80WP (Group 30)] and stock solutions of 10,000 mg/liter of each fungicide were prepared by dissolving commercial-grade fungicides in a sterile solvent. 50 ml of CV8 agar was poured into each dish, to form a layer of CV8 agar with a constant volume, thus when a stock solution is added to the agar, it results in a gradient from 0 to 1000 mg/liter across the agar surface. A method using a spiral gradient plater was used to determine effective concentration in inhibiting growth by 50% (EC_{50}). Pure cultures of *C. beticola* were prepared as described above. Conidial suspensions were prepared by flooding colony Petri dishes with 1 mL distilled water and scraping the conidia free from the surface with a rubber policeman. The conidial suspension (10 µL) was spread across the fungicide gradient plate from edge to center. Isolates were incubated for 14 d, at 24°C (two replications). The point coordinates at which the colonies start and end was recorded and entered into a software program, which calculates the EC_{50} for each isolate for each of the fungicides.

Results

The mean EC_{50} values were estimated for each of the fungicides listed above. In 2018 a total of 82, 73, 74, 74, 74, 53, 34 and 74 isolates were screened against the fungicides DFZ, FBZ, FTL, PTZ, TTZ, PYR, TPN and TPT respectively (Table 1). For DFZ, FBZ, FTL, PTZ, TTZ, PYR, TPN and TPT the mean EC_{50} values were 21.6, 23.6, 118.0, 122.7, 40.6, 44.4, 54.1 and 8.7 respectively in 2018 (Table 1). The distribution of *C. beticola* isolate sensitivity in EC_{50} values (mg/L) for all fungicides tested in 2018 ranged from <1 to >100 (Tables 1 and Figure 1).

Table 1. Comparison of mean effective concentration in growth by 50% (EC_{50}) for isolates of *Cercospora beticola* isolates to DFZ, FBZ, FTL, PTZ, TTZ, PYR, TPN and TPT 2018.

			EC_{50} (mg/L)[a]		
Active ingredient	FRAC[b] code	Total # of isolates	Mean (s.e.)[c]	Minimum	Maximum
Difenoconazole (DFZ)	3	82	21.6 ± 2.4	0.6	99.0
Fenbuconazole (FBZ)	3	73	23.6 ± 3.4	0.7	133.6
Flutriafol (FTL)	3	74	118.0 ± 4.4	4.1	137.8
Prothioconazole (PTZ)	3	74	122.7 ± 3.3	40.3	132.7
Tetraconazole (TTZ)	3	74	40.6 ± 5.0	0.7	136.5
Pyraclostrobin (PYR)	11	53	44.4 ± 5.5	0.6	128.0
Thiophanate-methyl (TPN)	1	34	54.1 ± 11.3	0.8	133.0
Triphenyltin OH (TPT)	30	74	8.7 ± 1.8	0.7	39.1

[a] EC50 values determined for two replications based on mean effective concentration in growth by 50% by spiral gradient dilution method.
[b] FRAC=Fungicide Resistance Action Committee group name based on chemical relatedness and mode of action
[c] s.e.=standard error of the mean.

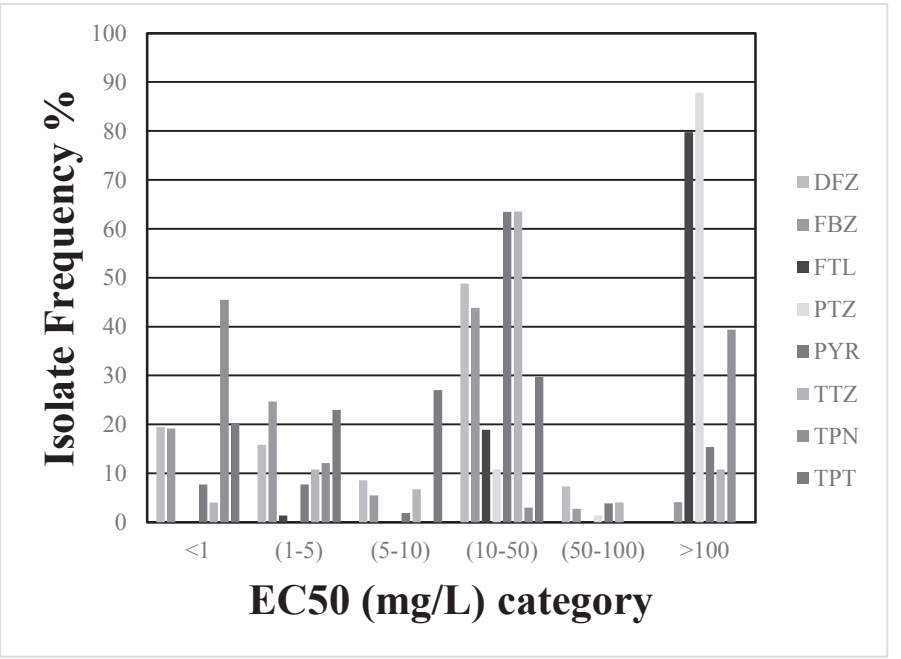

Figure 1. Frequency distributions of in vitro sensitivity of *Alternaria* spp. isolates collected in 2018 from sugarbeet leaves. Sensitivity expressed as 50% inhibition of fungal growth (EC_{50}) in vitro, fungicide concentration estimate based determined by the spiral gradient dilution method. Difenoconazole=DFZ; fenbuconazole=FBZ; flutriafol=FTL; prothioconazole=PTZ; tetraconazole=TTZ; pyraclostrobin=PYR, Thiophanate-methyl=TPN and triphenyltin OH=TPT.

Sugarbeet (*Beta vulgaris*)
Alternaria leaf spot; *Alternaria* spp.

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In-vitro fungicide sensitivity distributions of *Alternaria* spp. isolates from sugarbeet 2018

Alternaria leaf spot (ALS) disease caused by *Alternaria* spp. in the *alternata* and *tenuis* species-group is common wherever sugarbeet is grown. Infection by *Alternaria* spp. has historically been considered a minor pathogen in sugarbeet production in the US, due to its more opportunistic or secondary nature. During the 2016 growing season, increased incidence and severity of ALS was observed in MI at levels high enough to have the potential to cause yield loss due to defoliation. From 2015 to 2017 *Alternaria* spp. with higher levels of insensitivity to many classes of fungicides were recovered from commercial production areas in Michigan. Isolates of *Alternaria* spp. were tolerant to the quinone outside inhibitor (QoI), triazole, triphenyltin OH and prothioconazole fungicides. Therefore, sensitivity monitoring of pathogen populations to inform the development of fungicide resistant management and fungicide use recommendations is essential.

Sample collection and geographical origin of isolates: Isolates of *Alternaria* spp. were collected from leaves with symptoms of ALS sampled from sugarbeet fields in east-central Michigan during Sep and Oct in 2018. Samples of up to 20 leaves from throughout a selection of sugarbeet production fields in Michigan and Ontario, CA were used in sensitivity testing. Isolates of *Alternaria* spp. were recovered from infected leaf tissue from multiple field locations using standard methods for the program. Mono-conidial isolates from individual ALS lesions were obtained to determine sensitivity to each fungicide described below. From each sugarbeet leaf representative lesions were cut with a cork borer; the lesions were chosen from similar sizes and in similar stages of sporulation and surfaced sterilized. All leaf disks derived from a particular sampling site were placed onto water agar media (WA) amended with streptomycin and $CaCO_3$ (1000 ml of distilled H_2O, 15 g of Bacto Agar, and 1.5 g of $CaCO_3$) for sporulation induction and positive identification. From individual lesions one conidium of *Alternaria* spp. was transferred to clarified V-8 (CV8) media amended with streptomycin and $CaCO_3$ (900 ml of distilled H_2O, 100 ml of CV8, 15 g of Bacto Agar, and 1.5 g of $CaCO_3$) for subsequent fungicide sensitivity assays.

In vitro fungicide sensitivity of *Alternaria spp.* by dilution gradient: Difenoconazole [DFZ; Inspire®, (Group 3)], fenbuconazloe [FBZ; Enable®, (Group 3)], flutriafol [FTL; Topguard®, (Group 3)], prothioconazole [PTZ; Proline®, (Group 3)], tetraconazole [TTZ; Eminent®125 SL, (Group 3)], pyraclostrobin [PYR; Headline® 2.08SC, (Group 11)] and triphenyltin OH [TPT; Super Tin® 80WP (Group 30)] and stock solutions of 10,000 mg/liter of each fungicide were prepared by dissolving commercial-grade fungicides in a sterile solvent. 50 ml of CV8 agar was poured into each dish, to form a layer of CV8 agar with a constant volume, thus when a stock solution is added to the agar, it results in a gradient from 0 to 1000 mg/liter across the agar surface. A method using a spiral gradient plater was used to determine effective concentration in inhibiting growth by 50% (EC_{50}). Pure cultures of *Alternaria* spp. were prepared as described above. Conidial suspensions are prepared by flooding colony Petri dishes with 1 mL distilled water and scraping the conidia free from the surface with a rubber policeman. The conidial suspension (10 µL) was spread across the fungicide gradient plate from edge to center. Isolates were incubated for 14 d, at 24°C (two replications). The point coordinates at which the colonies start and end was recorded and entered into a software program, which calculates the EC_{50} for each isolate and fungicide.

Results

The mean EC_{50} values were estimated for each of the fungicides listed above. A total of 60, 77, 79, 73, 79, 79 and 68 isolates were screened against the fungicides DFZ, FBZ, FTL, PTZ, TTZ, PYR, and TPT respectively (Table 1). For DFZ, FBZ, FTL, PTZ, TTZ, PYR, and TPT the mean EC_{50} values were 1.7, 71.8, 55.1, 105.3, 78.7, 71.0 and 27.2 respectively (Table 1). The distribution of *Alternaria* spp. isolate sensitivity in EC_{50} values (mg/L) for all fungicides tested ranged from <1 to >100 (Table 1 and Figure 1).

Table 1. Comparison of mean effective concentration in growth by 50% (EC_{50}) for isolates of *Alternaria* spp. isolates to DFZ, FBZ, FTL, PTZ, TTZ, PYR, and TPT 2018.

			EC_{50} (mg/L)[a]		
Active ingredient	**FRAC[b] code**	**Total # of isolates**	**Mean (s.e.)[c]**	**Minimum**	**Maximum**
Difenoconazole (DFZ)	3	60	1.7 ± 0.3	0.6	8.95
Fenbuconazole (FBZ)	3	77	71.8 ± 7.8	0.7	133.6
Flutriafol (FTL)	3	79	55.1 ± 6.4	0.8	137.8
Prothioconazole (PTZ)	3	73	105.3 ± 7.0	0.7	132.7
Tetraconazole (TTZ)	3	79	78.7 ± 7.2	0.8	136.5
Pyraclostrobin (PYR)	11	79	71.0 ± 7.3	0.6	128.0
Triphenyltin OH (TPT)	30	68	27.2 ± 3.4	3.4	130.2

[a] EC50 values determined for two replications based on mean effective concentration in growth by 50% by spiral gradient dilution method.
[b] FRAC=Fungicide Resistance Action Committee group name based on chemical relatedness and mode of action
[c] s.e.=standard error of the mean.

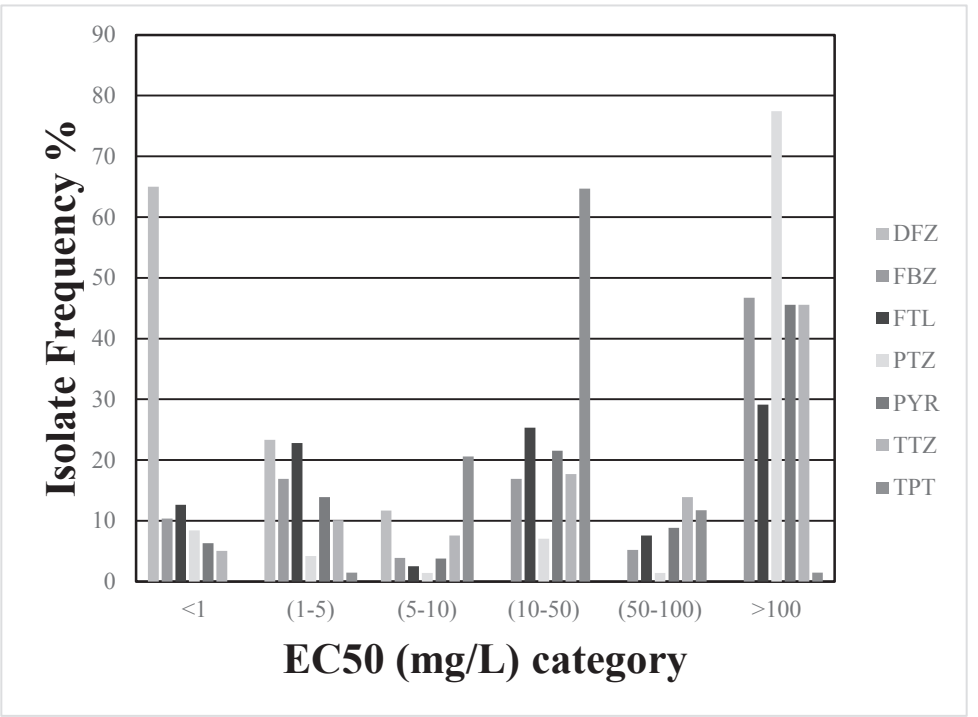

Figure 1. Frequency distributions of in vitro sensitivity of *Alternaria* spp. isolates collected in 2018 from sugarbeet leaves. Sensitivity expressed as 50% inhibition of fungal growth (EC_{50}) in vitro, fungicide concentration estimate based determined by the spiral gradient dilution method. Difenoconazole=DFZ; fenbuconazole=FBZ; flutriafol=FTL; prothioconazole=PTZ; tetraconazole=TTZ; pyraclostrobin=PYR and triphenyltin OH=TPT.

Evaluate Commercial Seed Treatments for Control of Rhizoctonia Root Rot in Sugarbeets
Bebow, Breckenridge, MI - 2018

Trial Quality: Fair-Good
Variety: SX-1245N
Planted: May 8
Harvested: Sept 14
Plots: 6 rows X 38 ft, 4 reps
Row Spacing: 22 inches

Soil Info: Sandy Clay Loam
% OM: 2.7 **pH:** 6.4 **CEC:** 13.3
P: above opt **K:** above opt
Mn: high **B:** med
Added N: 140 lbs
Prev Crop: Soybeans

Rhizoc Level: Very High
Cerc Control: Good
Problems: Too much disease
Seeding Rate: 4.5 inches
Rainfall: 20.5 inches

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 /Acre	App. Timing	Dead Beets / 100 Ft	Net $/A	Beets / 100ft		Vigor Rating* 0-10	RWSA	RWST
						Early	Late	Avg 3		
3	Systiva Quadris Quadris	5 g ai 10 fl oz 14.25 fl oz	ST In-Fur 8 lf	**23.9 e**	**$891 a-d**	250	**187 abc**	**7.3 ab**	**4796 ab**	**207 ab**
1	Systiva Quadris	5 g ai 10 fl oz	ST In-Fur	**26.4 e**	**$912 a-d**	250	**181 a-d**	**7.3 ab**	**4927 ab**	**210 ab**
9	Vibrance Quadris	2 g ai 10 fl oz	ST In-Fur	**33.1 e**	**$1,000 ab**	261	**195 ab**	**7.5 a**	**5391 a**	**217 a**
15	Metlock Rizolex Kabina Quadris Quadris	0.36 ml 5 g ai 7 g ai 10 fl oz 14.25 fl oz	ST ST ST In-Fur 8 lf	**35.3 e**	$836 cd	259	**185 abc**	**7.4 a**	4532 b	**213 ab**
5	Kabina Quadris	14 g ai 10 fl oz	ST In-Fur	**39.1 de**	**$940 abc**	263	**199 a**	**7.2 a-d**	**4998 ab**	**214 ab**
2	Systiva Quadris	5 g ai 14.25 fl oz	ST 8 lf	**47.8 cde**	**$1,006 a**	256	**168 a-d**	**7.3 abc**	**5372 a**	**209 ab**
11	Vibrance Quadris Quadris	2 g ai 10 fl oz 14.25 fl oz	ST In-Fur 8 lf	**49.9 cde**	$866 cd	249	**173 a-d**	**7.3 ab**	**4766 ab**	**216 ab**
13	Metlock Rizolex Kabina Quadris	0.36 ml 5 g ai 7 g ai 10 fl oz	ST ST ST In-Fur	**50.9 cde**	$864 cd	257	**181 a-d**	**7.3 ab**	4735 **ab**	**210 ab**
17	No Seed Trt Quadris	 10 fl oz	 In-Fur	**56.1 b-e**	$865 cd	271	**187 abc**	**7.1 a-d**	4572 b	**215 ab**
7	Kabina Quadris Quadris	14 g ai 10 fl oz 14.25 fl oz	ST In-Fur 8 lf	**56.7 b-e**	$837 cd	257	**174 a-d**	7.0 bcd	4506 b	**213 ab**
18	No Seed Trt Quadris	 14.25 fl oz	 8 lf	**57.7 b-e**	**$920 a-d**	264	**180 a-d**	**7.1 a-d**	**4886 ab**	**217 a**

Means followed by the same letter are not significantly different. Duncans New MRT 5%.

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

Net $/A: Assume a $40 beet payment and trial average RWST with fungicide costs subtracted off.
Bold: Results are not statistically different from top-ranking treatment in each column.

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Evaluate Commercial Seed Treatments for Control of Rhizoctonia Root Rot in Sugarbeets

Bebow, Breckenridge, MI - 2018

No.	Treatment	Rate /Acre	App. Timing	Dead Beets / 100 Ft	Net $/A	Beets / 100ft		Vigor Rating* 0-10	RWSA	RWST
						Early	Late	Avg 3		
14	Metlock Rizolex Kabina Quadris	0.36 ml 5 g ai 7 g ai 14.25 fl oz	ST ST ST 8 lf	**59.2 b-e**	$880 bcd	277	**160 a-d**	**7.3 ab**	**4820 ab**	**213 ab**
19	No Seed Trt Quadris Quadris	 10 fl oz 14.25 fl oz	 In-Fur 8 lf	**62.1 b-e**	$817 cd	268	**184 abc**	7.0 bcd	4348 b	**205 ab**
12	Vibrance No Quadris	2 g ai	ST	**62.3 b-e**	$860 cd	257	151 cd	**7.2 a-d**	4688 b	**206 ab**
16	Metlock Rizolex Kabina No Quadris	0.36 ml 5 g ai 7 g ai	ST ST ST	76.6 bcd	**$885 a-d**	269	**173 a-d**	**7.1 a-d**	**4726 ab**	**205 ab**
4	Systiva No Quadris	5 g ai	ST	77.4 bc	$870 cd	250	156 bcd	**7.2 a-d**	4684 b	205 b
10	Vibrance Quadris	2 g ai 14.25 fl oz	ST 8 lf	81.9 bc	$842 cd	273	151 cd	**7.1 a-d**	4508 b	**205 ab**
6	Kabina Quadris	14 g ai 14.25 fl oz	ST 8 lf	85.5 bc	$833 cd	268	152 cd	6.9 cd	4534 b	**208 ab**
8	Kabina No Quadris	14 g ai	ST	89.9 b	$804 d	266	151 cd	6.8 d	4361 b	**210 ab**
20	No Quadris No Seed Trt			124.7 a	$626 e	271	140 d	6.4 e	3291 c	193 c

Average	59.81	$867.8	261.9	171.4	7.14	4672.0	209.6
LSD 5%	32.00	108.0	n.s.	34.4	0.32	550.2	9.7
CV %	46.5	10.5	7.4	17.5	3.9	10.3	4.1

Means followed by the same letter are not significantly different. Duncans New MRT 5%.

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

Comments: Systiva, Vibrance, Tri-pak (Metlock = Rizolex + Kabina 7 g) and Kabina (seed treatments for Rhizoctonia) were applied with and without Quadris in this small plot replicated trial. The Rhizoctonia (*Rhizoctonia solani* AG 2-2 IIIB) level was very high. There were no significant differences between the seed treatments with respect to disease control or sugarbeet stand, however, all of the seed treatments were improvements over the untreated check plots. Performance was improved with the addition of Quadris, especially when applied In-furrow at planting. The sugarbeet variety planted is susceptible to Rhizoctonia.

Net $/A: Assume a $40 beet payment and trial average RWST with fungicide costs subtracted off.
Bold: Results are not statistically different from top-ranking treatment in each column.

Evaluate Commercial Seed Treatments for Control of Rhizoctonia Root Rot in Sugarbeets Bebow, Breckenridge, MI - 2018

Effect of Seed Treatments (avg. of all Quadris applic.)

No.	Treatment	Rate /Acre	App. Timing	Dead Beets / 100 Ft	Net $/A	Beets / 100ft		Vigor Rating* 0-10	RWSA	RWST
						Early	Late	Avg 3		
1	Quadris	10 fl oz	In Fur	**41.1 c**	**$916 a**	260.5	**188.5 a**	**7.3 a**	**4925 a**	**213 a**
3	Quadris Quadris	10 fl oz 14.25 fl oz	In Fur 8 lf	**45.6 c**	$849 bc	256.9	**180.4 a**	**7.2 a**	4590 bc	**211 a**
2	Quadris	14.25 fl oz	8 lf	66.4 b	**$896 ab**	267.6	162.2 b	**7.1 a**	**4824 ab**	**210 a**
4	No Quadris			86.2 a	$809 c	262.7	154.3 b	7.0 b	4350 c	204 b
Average				59.81	$867.8	261.91	171.36	7.14	4672.0	209.6
LSD 5 %				14.36	48.3	9.31	15.45	0.14	253.9	4.4
CV %				46.7	10.8	6.9	17.5	3.9	10.6	4.0

Effect of Quadris Applic. (avg. of all Seed Treatments)

No.	Treatment	Rate /Acre	App. Timing	Dead Beets / 100 Ft	Net $/A	Beets / 100ft		Vigor Rating* 0-10	RWSA	RWST
						Early	Late	Avg 3		
1	Systiva	5 g ai	ST	**43.9 c**	**$920 a**	251.6	173.2	**7.3 a**	**4945 a**	208
4	Metlock Rizolex Kabina	.36 ml 5 g ai 7 g ai	ST ST ST	**55.5 bc**	**$866 abc**	265.6	174.7	**7.3 a**	**4703 ab**	210
3	Vibrance	2 g ai	ST	**56.8 abc**	**$892 ab**	260.3	167.4	**7.3 a**	**4838 ab**	211
2	Kabina	14 g ai	ST	67.8 ab	$853 bc	263.7	168.9	7.0 b	4600 bc	211
5	No Seed Trt			75.2 a	$807 c	268.4	172.7	6.9 b	4274 c	208
Average				59.81	$867.8	261.91	171.35	7.14	4672.0	209.6
LSD 5 %				19.14	62.6	n.s.	n.s.	0.21	329.3	n.s.
CV %				53.2	12.0	9.9	19.0	4.9	11.7	3.9

Means followed by the same letter are not significantly different. Duncans New MRT 5%.

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

Net $/A: Assume a $40 beet payment and trial average RWST with fungicide costs subtracted off.

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

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Evaluate Commercial Seed Treatments for Control of Rhizoctonia Root Rot in Sugarbeets
Shaffner, Freeland, MI - 2018

Trial Quality: Fair
Variety: SX-1245N
Planted: May 9
Harvested: Sept 21
Plots: 6 rows X 38 ft, 4 reps
Row Spacing: 22 inches

Soil Info: Loam
% OM: 2.6 **pH:** 6.2 **CEC:** 13.4
P: above opt **K:** above opt
Mn: high **B:** low
Added N: 135 lbs
Prev Crop: Corn

Rhizoc Level: Low
Cerc Control: Good
Problems: Low disease
Seeding Rate: 4.5 inches
Rainfall: 12.8 inches

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 /Acre	App. Timing	Dead Beets / 100 Ft	Net $/A	Beets / 100ft		Vigor Rating* 0-10	RWSA	RWST
						Early	Late	Avg 2		
3	Systiva Quadris Quadris	5 g ai 10 fl oz 14.25 fl oz	ST In-Fur 8 lf	0.8	$1,495	**222 a-d**	**213 abc**	8.3	9268	242
7	Kabina Quadris Quadris	14 g ai 10 fl oz 14.25 fl oz	ST In-Fur 8 lf	1.7	$1,457	**221 a-d**	**213 abc**	7.9	9048	246
15	Metlock Rizolex Kabina Quadris Quadris	0.36 ml 5 g ai 7 g ai 10 fl oz 14.25 fl oz	ST ST ST In-Fur 8 lf	1.8	$1,451	**241 ab**	**233 a**	8.0	9087	246
8	Kabina No Quadris	14 g ai	ST	1.8	$1,432	**228 a-d**	**221 abc**	7.8	8906	250
14	Metlock Rizolex Kabina Quadris	0.36 ml 5 g ai 7 g ai 14.25 fl oz	ST ST ST 8 lf	2.3	$1,512	**222 a-d**	**214 abc**	8.1	9385	244
11	Vibrance Quadris Quadris	2 g ai 10 fl oz 14.25 fl oz	ST In-Fur 8 lf	2.3	$1,498	**237 ab**	**229 ab**	8.1	9348	252
4	Systiva No Quadris	5 g ai	ST	2.3	$1,547	**221 a-d**	**214 abc**	8.0	9584	252
16	Metlock Rizolex Kabina No Quadris	0.36 ml 5 g ai 7 g ai	ST ST ST	2.5	$1,473	**240 ab**	**231 ab**	8.2	9141	244
2	Systiva Quadris	5 g ai 14.25 fl oz	ST 8 lf	2.5	$1,522	203 cd	193 c	7.8	9429	249
13	Metlock Rizolex Kabina Quadris	0.36 ml 5 g ai 7 g ai 10 fl oz	ST ST ST In-Fur	2.8	$1,535	**230 a-d**	**223 abc**	8.2	9607	252

Means followed by the same letter are not significantly different. Duncans New MRT 5%.

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

Net $/A: Assume a $40 beet payment and trial average RWST with fungicide costs subtracted off.
Bold: Results are not statistically different from top-ranking treatment in each column.

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Evaluate Commercial Seed Treatments for Control of Rhizoctonia Root Rot in Sugarbeets

Shaffner, Freeland, MI - 2018

No.	Treatment	Rate /Acre	App. Timing	Dead Beets / 100 Ft	Net $/A	Beets / 100ft		Vigor Rating* 0-10	RWSA	RWST
						Early	Late	Avg 3		
10	Vibrance Quadris	2 g ai 14.25 fl oz	ST 8 lf	2.8	$1,463	**223 a-d**	**213 abc**	7.7	9128	240
19	No Seed Trt Quadris Quadris	 10 fl oz 14.25 fl oz	 In-Fur 8 lf	3.0	$1,452	**242 a**	**236 a**	7.9	8936	242
17	No Seed Trt Quadris	 10 fl oz	 In-Fur	3.0	$1,501	**232 abc**	**223 abc**	8.0	9234	247
12	Vibrance No Quadris	2 g ai	ST	3.5	$1,498	**228 a-d**	**219 abc**	7.9	9342	250
5	Kabina Quadris	14 g ai 10 fl oz	ST In-Fur	3.5	$1,484	**224 a-d**	**216 abc**	7.6	9210	248
1	Systiva Quadris	5 g ai 10 fl oz	ST In-Fur	3.5	$1,515	201 d	194 c	7.7	9386	244
9	Vibrance Quadris	2 g ai 10 fl oz	ST In-Fur	3.7	$1,463	**218 a-d**	**210 abc**	7.7	9132	247
6	Kabina Quadris	14 g ai 14.25 fl oz	ST 8 lf	4.0	$1,453	211 bcd	201 bc	7.8	9034	246
20	No Seed Trt No Quadris			4.2	$1,420	**239 ab**	**229 ab**	7.5	8734	237
18	No Seed Trt Quadris	 14.25 fl oz	 8 lf	4.7	$1,393	**230 a-d**	**213 abc**	7.4	8570	243

Average	2.84	$1,478.2	225.6	217.0	7.88	9175.5	246.1
LSD 5%	n.s.	n.s.	25.1	24.9	n.s.	n.s.	n.s.
CV %	65.6	5.6	9.7	10.0	6.8	5.7	4.4

Means followed by the same letter are not significantly different. Duncans New MRT 5%.

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

Comments: Systiva, Vibrance, Tri-Pak (Metlock = Rizolex + Kabina 7 g) and Kabina (seed treatments for Rhizoctonia) were applied with and without Quadris in this small plot replicated trial. The Rhizoctonia (*Rhizoctonia solani* AG 2-2 IIIB) level was too low to obtain valid disease ratings. Systiva appeared to reduce sugarbeet stand slightly. The variety planted is susceptible to Rhizoctonia.

Net $/A: Assume a $40 beet payment and trial average RWST with fungicide costs subtracted off.
Bold: Results are not statistically different from top-ranking treatment in each column.

Effect of Quadris Applic. (avg. of all Seed Treatments)

No.	Treatment	Rate /Acre	App. Timing	Dead Beets / 100 Ft	Net $/A	Beets / 100ft		Vigor Rating* 0-10	RWSA	RWST
						Early	Late	Avg 3		
3	Quadris Quadris	10 fl oz 14.25 fl oz	In Fur 8 lf	**1.9 b**	$1,471	**233 a**	**225 a**	8.0	9137	246
4	No Quadris			**2.9 ab**	$1,474	**231 ab**	**223 ab**	7.9	9142	247
1	Quadris	10 fl oz	In Fur	3.3 a	$1,500	221 bc	213 bc	7.8	9314	248
2	Quadris	14.25 f oz	8 lf	3.3 a	$1,468	218 c	207 c	7.8	9109	244

Average	2.85	$1,478.2	225.6	217.0	7.88	9175.5	246.1
LSD 5 %	0.96	n.s.	11.2	11.1	n.s.	n.s.	n.s.
CV %	65.6	5.7	9.7	10.0	6.8	5.7	4.4

Effect of Seed Treatments (avg. of all Quadris applic.)

No.	Treatment	Rate /Acre	App. Timing	Dead Beets / 100 Ft	Net $/A	Beets / 100ft		Vigor Rating* 0-10	RWSA	RWST
						Early	Late	Avg 3		
1	Systiva	5 g ai	ST	**2.3 b**	**$1,520 a**	212 c	204 c	**7.9 ab**	**9417 a**	247
4	Metlock Rizolex Kabina	0.36 ml 5 g ai 7 g ai	ST ST ST	**2.4 b**	**$1,493 ab**	**233 a**	**225 a**	**8.1 a**	**9305 ab**	247
2	Kabina	14 g ai	ST	**2.8 b**	$1,457 bc	221 bc	213 bc	7.8 b	9050 bc	247
3	Vibrance	2 g ai	ST	**3.1 ab**	**$1,481 abc**	**226 ab**	**218 ab**	7.8 b	**9238 ab**	248
5	No Seed Trt			3.7 a	$1,441 c	**236 a**	**225 a**	7.7 b	8869 c	242

Average	2.86	$1,478.2	225.6	217.0	7.88	9175.5	246.1
LSD 5 %	0.87	45.3	11.3	11.5	0.27	279.0	n.s.
CV %	50.9	5.1	8.3	8.8	5.6	5.0	4.4

Means followed by the same letter are not significantly different. Duncans New MRT 5%.

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

Net $/A: Assume a $40 beet payment and trial average RWST with fungicide costs subtracted off.
Bold: Results are not statistically different from top-ranking treatment in each column.

Evaluate Commercial Seed Treatments for Control of Rhizoctonia Root Rot in Sugarbeets
Blumfield, Richville, MI - 2018

Trial Quality: Fair
Variety: C-G333N
Planted: April 30
Harvested: Sept 25
Plots: 6 rows X 38 ft, 4 reps
Row Spacing: 22 inches

Soil Info: Sandy Clay Loam
% OM: 2.1 **pH:** 7.9 **CEC:** 19.7
P: above opt **K:** above opt
Mn: high **B:** med
Added N: 135 lbs
Prev Crop: radish

Rhizoc Level: Low
Cerc Control: Good
Problems: Lack of disease
Seeding Rate: 4.5 inches
Rainfall: 21.3 inches

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 /Acre	App. Timing	Dead Beets / 100 Ft		Net $/A	Beets / 100ft		Vigor Ratings * 0-10	RWSA	RWST
							Early		Late	Avg 3		
7	Kabina Quadris Quadris	14 g ai 10 fl oz 14.25 fl oz	ST In-Fur 8 lf	**0.2**	**d**	$1,298	**224**	**a-e**	183	8.0	7589	229
3	Systiva Quadris Quadris	5 g ai 10 fl oz 14.25 fl oz	ST In-Fur 8 lf	**0.2**	**d**	$1,278	207	e	169	7.9	7527	231
6	Kabina Quadris	14 g ai 14.25 fl oz	ST 8 lf	**0.3**	**cd**	$1,361	**230**	**a-d**	179	8.3	7883	228
1	Systiva Quadris	5 g ai 10 fl oz	ST In-Fur	**0.3**	**cd**	$1,307	211	cde	172	8.3	7598	234
11	No Seed Trt Quadris Quadris	 10 fl oz 14.25 fl oz	 In-Fur 8 lf	**0.7**	**bcd**	$1,275	210	de	173	7.8	7458	230
10	No Seed Trt Quadris	 14.25 fl oz	 8 lf	**0.7**	**bcd**	$1,298	**235**	**ab**	180	8.2	7526	225
5	Kabina Quadris	14 g ai 10 fl oz	ST In-Fur	**0.7**	**bcd**	$1,388	**225**	**a-e**	174	8.2	8014	229
2	Systiva Quadris	5 g ai 14.25 fl oz	ST 8 lf	**0.7**	**bcd**	$1,375	215	b-e	171	8.0	8019	232
4	Systiva No Quadris	5 g ai	ST	**1.2**	**bcd**	$1,247	217	b-e	170	7.7	7196	225
9	No Seed Trt Quadris	 10 fl oz	 In-Fur	1.3	bc	$1,367	214	cde	176	8.1	7890	230
8	Kabina No Quadris	14 g ai	ST	1.5	b	$1,325	**243**	**a**	176	7.8	7590	228
12	No Seed Trt No Quadris			2.7	a	$1,264	**231**	**abc**	180	7.7	7238	227

Average	0.86	$1,315.3	221.9	175.3	7.99	7627.2	229.1
LSD 5%	0.92	n.s.	17.9	n.s.	n.s.	n.s.	n.s.
CV %	91.9	9.4	6.9	6.9	6.6	9.2	4.2

Means followed by the same letter are not significantly different. Duncans New MRT 5%.

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

Net $/A: Assume a $40 beet payment and trial average RWST with fungicide costs subtracted off.
Bold: Results are not statistically different from top-ranking treatment in each column.

Evaluate Commercial Seed Treatments for Control of Rhizoctonia Root Rot in Sugarbeets
Blumfield, Richville, MI - 2018

Effect of Seed Treatments (avg. of all Quadris applic.)

No.	Treatment	Rate /Acre	App. Timing	Dead Beets / 100 Ft	Net $/A	Beets / 100ft		Vigor Rating* 0-10	RWSA	RWST
						Early	Late	Avg 3		
1	Systiva	5 g ai	ST	0.6	$1,302	213	170	8.0	7585	231
2	Kabina	14 g ai	ST	0.7	$1,343	231	178	8.1	7769	228
3	Untreated Check			1.3	$1,301	222	177	7.9	7528	228
Average				0.87	$1,315.3	221.91	175.28	7.99	7627.3	229.0
LSD 5 %				n.s.	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.
CV %				128.4	5.4	11.0	9.4	5.0	5.4	4.9

Effect of Quadris Applic. (avg. of all Seed Treatments)

No.	Treatment	Rate /Acre	App. Timing	Dead Beets / 100 Ft	Net $/A	Beets / 100ft		Vigor Rating* 0-10	RWSA	RWST
						Early	Late	Avg 3		
3	Quadris Quadris	10 fl oz 14.25 fl oz	In Fur 8 lf	**0.3 b**	$1,284	214 c	175	7.9	7524	230
2	Quadris	14.25 fl oz	8 lf	**0.6 b**	$1,345	**227 ab**	177	8.1	7809	229
1	Quadris	10 fl oz	In Fur	**0.8 b**	$1,354	217 bc	174	8.2	7834	231
4	Untreated Check			1.8 a	$1,279	**230 a**	175	7.7	7341	226
Average				0.88	$1,315.5	221.91	175.28	7.99	7627.0	229.0
LSD 5 %				0.53	n.s.	10.33	n.s.	n.s.	n.s.	n.s.
CV %				91.9	9.2	6.9	6.9	6.6	9.2	4.2

Means followed by the same letter are not significantly different. Duncans New MRT 5%.

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

Comments: Systiva and Kabina (seed treatments for Rhizoctonia) were applied with and without Quadris in this small plot replicated trial. The Rhizoctonia (*Rhizoctonia solani* AG 2-2 IIIB) level was too low to make accurate disease assessments. Neither seed treatment effected sugarbeet emergence. The sugarbeet variety planted has partial tolerance to Rhizoctonia.

Net $/A: Assume a $40 beet payment and trial average RWST with fungicide costs subtracted off.

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

Evaluate Commercial Seed Treatments for Control of Rhizoctonia Root Rot in Sugarbeets
Shaffner, Freeland, MI - 2018

Trial Quality: Fair-Good
Variety: C-G333N
Planted: May 9
Harvested: Sept 21
Plots: 6 rows X 38 ft, 4 reps
Row Spacing: 22 inches

Soil Info: Sandy Loam
% OM: 3.2 **pH:** 6.1 **CEC:** 10.7
P: above opt **K:** above opt
Mn: high **B:** low
Added N: 135 lbs
Prev Crop: Corn

Rhizoc Level: Low-Moderate
Cerc Control: Good
Problems: None
Seeding Rate: 4.5 inches
Rainfall: 12.8 inches

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 /Acre	App. Timing	Dead Beets / 100 Ft	Net $/A	Beets / 100ft Early	Beets / 100ft Late	Vigor Rating* 0-10 Avg 3	RWSA	RWST
3	Systiva Quadris Quadris	5 g ai 10 fl oz 14.25 fl oz	ST In-Fur 8 lf	**2.0 b**	$1,588	131 c	262	8.0	9634	241
7	Kabina Quadris Quadris	14 g ai 10 fl oz 14.25 fl oz	ST In-Fur 8 lf	**2.3 b**	$1,626	135 c	269	8.0	9807	240
11	No Seed Trt Quadris Quadris	 10 fl oz 14.25 fl oz	 In-Fur 8 lf	**2.5 b**	$1,595	128 c	270	7.9	9627	236
1	Systiva Quadris	5 g ai 10 fl oz	ST In-Fur	**3.3 b**	$1,622	136 c	244	7.2	9742	236
5	Kabina Quadris	14 g ai 10 fl oz	ST In-Fur	**3.5 b**	$1,608	136 c	246	7.0	9608	234
9	No Seed Trt Quadris	 10 fl oz	 In-Fur	**4.3 b**	$1,665	140 bc	243	6.7	9945	238
8	Kabina No Quadris	14 g ai	ST	**4.5 b**	$1,542	**172 a**	263	7.7	9153	236
10	No Seed Trt Quadris	 14.25 fl oz	 8 lf	**4.7 b**	$1,613	**153 abc**	225	6.8	9669	237
4	Systiva No Quadris	5 g ai	ST	**4.8 b**	$1,587	**169 a**	250	7.8	9473	240
2	Systiva Quadris	5 g ai 14.25 fl oz	ST 8 lf	**5.2 b**	$1,606	**173 a**	243	7.1	9677	241
6	Kabina Quadris	14 g ai 14.25 fl oz	ST 8 lf	**6.5 b**	$1,637	**165 ab**	238	6.6	9811	241
12	No Seed Trt No Quadris			11.0 a	$1,501	**147 abc**	247	7.4	8911	230
Average				4.56	$1,599.2	148.8	250.0	7.34	9588.0	237.4
LSD 5%				4.48	n.s.	24.2	n.s.	n.s.	n.s.	n.s.
CV %				84.6	7.4	14.0	11.1	15.4	7.3	2.7

Means followed by the same letter are not significantly different. Duncans New MRT 5%.

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

Net $/A: Assume a $40 beet payment and trial average RWST with fungicide costs subtracted off.
Bold: Results are not statistically different from top-ranking treatment in each column.

Evaluate Commercial Seed Treatments for Control of Rhizoctonia Root Rot in Sugarbeets

Shaffner, Freeland, MI - 2018

Effect of Seed Treatments (avg. of all Quadris applic.)

No.	Treatment	Rate /Acre	App. Timing	Dead Beets / 100 Ft	Net $/A	Beets / 100ft		Vigor Rating* 0-10	RWSA	RWST
						Early	Late	Avg 3		
1	Systiva	5 g ai	ST	3.8	$1,600	152	250	7.5	9632	239
2	Kabina	14 g ai	ST	4.2	$1,603	152	254	7.3	9595	237
3	Untreated Check			5.6	$1,594	142	246	7.2	9538	235
Average				4.53	$1,599.2	148.8	250.0	7.34	9588.0	237.4
LSD 5 %				1.47	79.1	15.8	16.2	0.50	469.7	2.5
CV %				50.2	7.7	16.5	10.1	10.5	7.6	1.7

Effect of Quadris Applic. (avg. of all Seed Treatments)

No.	Treatment	Rate /Acre	App. Timing	Dead Beets / 100 Ft	Net $/A	Beets / 100ft		Vigor Rating* 0-10	RWSA	RWST
						Early	Late	Avg 3		
3	Quadris Quadris	10 fl oz 14.25 fl oz	In Fur 8 lf	**2.3 c**	$1,603	131 b	**267 a**	**7.9 a**	9689	239
1	Quadris	10 fl oz	In Fur	**3.7 bc**	$1,631	138 b	244 b	7.0 bc	9765	236
2	Quadris	14.25 fl oz	8 lf	5.4 ab	$1,619	**164 a**	235 b	6.8 c	9719	240
4	Untreated Check			6.8 a	$1,544	**163 a**	**253 ab**	**7.6 ab**	9179	235
Average				4.55	$1,599.2	148.8	250.0	7.34	9588.0	237.4
LSD 5 %				2.59	79.1	13.9	18.6	0.76	469.5	4.2
CV %				84.6	7.4	14.0	11.1	15.4	7.3	2.7

Means followed by the same letter are not significantly different. Duncans New MRT 5%.

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

Comments: Systiva and Kabina (seed treatments for Rhizoctonia) were applied with and without Quadris in this small plot replicated trial. The Rhizoctonia (*Rhizoctonia solani* AG 2-2 IIIB) level was low to moderate. Systiva and Kabina provided similar levels of Rhizoctonia root rot control and did not damage sugarbeet emergence. Preformance was improved with the addition of Quadris, especially when applied In-furrow at planting, although it slowed emergence and had a slight effect on final stand. The sugarbeet variety planted has partial tolerance to Rhizoctonia.

Net $/A: Assume a $40 beet payment and trial average RWST with fungicide costs subtracted off.

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

MICHIGAN STATE UNIVERSITY EXTENSION

Michigan State University AgBioResearch

Evaluation of fungicide seed treatments to manage Aphanomyces root rot of sugar beet

Jaime Willbur and Chris Bloomingdale, Michigan State University

Location: Saginaw (Spero Farms)	**Treatment Timings:** Seed Treatment
Planting Dates: May 1, 2018 & May 18, 2018	**Pesticides:** see table
Soil Type: Sandy Loam	**O.M.:** 3.0 **pH:** 7.2
Replicates: 4	**Variety:** Valent Lot 7179.27.11.1001

Table 1. Sugar beet stand counts, disease index ratings, and yield parameters from the two tested planting dates.

Treatment	Stand Count[a]	Disease Index (%)[b]	Yield (t/A)	Sugar (%)	RWST
Planting 1	262.9	29.1	50.7 a	14.7	211.9
Planting 2	258.0	28.6	44.2 b	14.5	208.4

Table 2. Sugar beet stand counts, disease index ratings, and yield parameters by fungicide seed treatment programs.

Treatment and Rate/Acre	Stand Count[a]	Disease Index (%)[b]	Yield (t/A)	Sugar (%)	RWST
Non-treated control	259.0 a-c	30.6	47.5	14.6	211.7
Sebring 318FS 0.015 fl oz + Systiva XS 0.52 fl oz + Tachigaren 70WP 1.59 oz	254.6 bc	27.8	47.0	14.6	209.8
Sebring 318FS 0.015 fl oz + Systiva XS 0.52 fl oz + Intego Solo 3.2FS 0.35 fl oz	245.1 c	26.9	46.5	14.7	212.0
Sebring 318FS 0.015 fl oz + Experimental 0.04 fl oz + Intego Solo 3.2FS 0.35 fl oz	272.8 a	30.0	47.4	14.4	208.1
Sebring 318FS 0.015 fl oz + Experimental 0.04 fl oz + Metlock 3.7FS 0.015 fl oz + Rizolex 4.17FS 0.031 fl oz + Intego Solo 3.2FS 0.35 fl oz	269.1 a	30.1	48.5	14.7	211.2
Sebring 318FS 0.015 fl oz + Experimental 0.04 fl oz + Metlock 3.7FS 0.015 fl oz + Rizolex 4.17FS 0.031 fl oz + Intego Solo 3.2FS 0.35 fl oz + Aveo EZ 0.14 fl oz	262.0 ab	27.8	47.9	14.5	208.2

[a] Column values followed by the same letter are not significantly different based on Fisher's Protected LSD (α=0.05); if no letter, then the effect is not significant.

[b] Disease index was calculated by multiplying the disease incidence (0-100%) by the severity (0-7), then dividing by 7.

Summary: There was not a significant planting date x seed treatment interaction (P>0.05) for any of the parameters analyzed, so planting date and seed treatments were analyzed separately. Planting date did not have a significant effect on stand establishment (P>0.05). There were significant differences among seed treatments in stand establishment (P<0.01). Treatments with compound A did have numerically greater stand counts, but these values were not significantly different from the non-treated control. Analysis of root disease ratings revealed no effects of planting date or seed treatment on disease index (P>0.05). Yield was significantly affected by planting date (P<0.0001) but not by seed treatment (P>0.05). Plots planted at the earlier timing averaged 6.5 t/A more than the later planting date. Percent sugar did not differ among treatments or planting dates (P>0.05), with the trial average being 14.6%. Mean RWST also did not differ between planting dates or among seed treatments (P>0.05).

This trial was not inoculated with *Aphanomyces* sp. but was planted in a grower field with a previous history of disease. End-of-season root evaluations suggest that *Aphanomyces* sp. were widespread throughout the trial, but roots were unaffected by seed treatments. The Aphanomyces root rot symptoms observed were more consistent with the chronic phase of the disease, onset between June and harvest, than with the acute seedling blight. If seed treatments were targeted at early season prevention, then they may have been more effective if seedling blight had been an issue in this field. All yields were greater than the 30 t/A averages for Michigan in 2017. No significant stand loss was detected and Rhizoctonia and leaf spot diseases were heavily managed with foliar programs. This in combination with low early season disease pressure likely accounts for the high yields observed in this trial.

Systiva Seed Treatment

Wegener Farms, Auburn - 2018

Trial Quality: Very good
Variety: C-G333NT
Planted: April 29
Harv/Samp: Nov 3 / Oct 17
Plot Size: 4 reps
Row Spacing: 30 inch
Seeding Rate: 56,000

Soil Info: Loam
Fertilizer: Fall: 250# Potash; 2x2: 10 gal 28%, 6 gal 10-34-0, 4 gal Thiosul, 1 qt B; S.D.: 35 gal 28%
Prev Crop: Dry beans
Weather: Dry until mid July, then good weather

Rhiz Control: Low/moderate pressure: See treatments
Cerc Control: Good control: 6/30 Inspire XT + Topsin, 7/20 S.T. + Badge, 8/3 Enable + EBDC, 8/20 S.T. + EBDC, 9/5 Delaro + Proline
Other Pests: N/A

Treatment	$/A	RWSA	RWST	T/A	% Sugar	% CJP	Population 100 Ft. of Row		Dead Beets 1200 Ft
							10 Day	30 Day	
No Systiva Foliar Quadris	$1,480	**8801**	**241**	**36.5**	**16.4**	**96.4**	**110**	**286**	**50**
No Systiva In Furrow Quadris	$1,437	**8554**	**242**	**35.4**	**16.3**	**96.4**	**112**	**298**	**52**
Systiva Foliar Quadris	$1,432	**8532**	**243**	**35.1**	**16.4**	**96.3**	**129**	**298**	**18**
No Systiva In Furrow & Foliar	$1,431	**8518**	**245**	**34.8**	**16.5**	**96.0**	**112**	**298**	**26**
Systiva In Furrow & Foliar	$1,404	**8357**	**241**	**34.7**	**16.3**	**96.3**	**116**	**292**	**7**
Systiva In Furrow Quadris	$1,398	**8316**	**241**	**34.5**	**16.3**	**96.4**	**116**	**292**	**35**
Systiva No Quadris	$1,380	**8217**	**238**	**34.5**	**16.2**	**96.1**	**129**	**298**	82
No Systiva No Quadris	$1,336	**7952**	**236**	**33.6**	**16.0**	**96.2**	**110**	**286**	121
LSD 5%	—	ns	ns	ns	ns	ns	ns	ns	58
CV %	—	4	2	3.5	1.5	0.5	14	3	81

Comments: This trial was conducted to look at the effect of Systiva seed treatment (BASF) with and without Quadris applied in a T-band in-furrow and foliar. This is the third year of testing Systiva in SBA trials. This trial had low to moderate disease pressure which led to a low amount of impact on yield and quality. In these trials, the best indicator of the treatment's performance against Rhizoctonia is the dead beet counts. All treatments that had Quadris were significantly better than the check (No Quadris/No Systiva) for dead beet counts. In regard to dead beet counts, every Quadris treatment was numerically improved when Systiva was included in the same treatment (for instance In-furrow Quadris compared to Systiva + In-furrow Quadris). An interesting trend over 6 trials from the last 3 years has occurred in regard to tonnage. In any treatment that had Quadris applied (either in-furrow, foliar or both), the same treatment with Systiva yielded less than the Quadris only treatment in 13 of 14 comparisons. These yield differences are small and not statistically significant, but consistent. This spring, seedling injury from Systiva was seen at the VanDenBoom Trial. It is possible that since the Systiva does not greatly improve disease control when Quadris is used, the injury early in the season may be causing some small yield loss. The in-furrow treatments had 5.5 oz/acre of Quadris with 2.5 oz of Mustang Max. The foliar treatments were 10.5 oz/acre of Quadris applied on 6/7 at the 8 leaf stage.

$/A: Gross payment unless noted as net. Calculated assuming a $40 payment, an average RWST of 238.
Bold: Results are not statistically different from top ranking treatment in each column.

Systiva Seed Treatment

VanDenBoom Farms, Munger - 2018

Trial Quality: Very good
Variety: C-G333NT
Planted: May 1
Harv/Samp: Oct 29 / Oct 17
Plot Size: 4 reps
Row Spacing: 28 inch
Seeding Rate: 55,000

Soil Info: Loam
Fertilizer: Fall: V.R. MESZ, Potash; 2x2: 44#-20#-0-11S+ Zn, MN, B; S.D. 47 gal of 28%
Prev Crop: Corn
Weather: Dry until mid July, then good weather

Rhiz Control: Low/moderate pressure. See treatments.
Cerc Control: Good control: See comments for materials
Other Pests: N/A

Treatment	$/A	RWSA	RWST	T/A	% Sugar	% CJP	Population 100 Ft. of Row		Dead Beets
							13 Day	30 Day	1200 Ft
Systiva In Furrow & Foliar	$1,620	**9641**	**268**	**36.0**	**17.7**	**96.5**	216	**275**	**11**
No Systiva In Furrow Quadris	$1,616	**9620**	**263**	**36.6**	**17.4**	**96.7**	246	**269**	**36**
Systiva Foliar Quadris	$1,611	**9588**	**269**	**35.6**	**17.8**	**96.5**	209	**268**	**33**
No Systiva In Furrow & Foliar	$1,592	**9471**	**261**	**36.3**	**17.4**	**96.2**	246	**269**	**44**
No Systiva Foliar Quadris	$1,591	**9465**	**263**	**36.0**	**17.5**	**96.5**	**260**	**273**	**56**
No Systiva No Quadris	$1,573	**9360**	**260**	**36.0**	**17.4**	**96.4**	**260**	**273**	122
Systiva In Furrow Quadris	$1,560	**9284**	**263**	**35.3**	**17.5**	**96.9**	216	**275**	**49**
Systiva No Quadris	$1,502	**8936**	**264**	33.9	**17.5**	**96.3**	209	**268**	98
LSD 5%	—	ns	ns	1.4	ns	ns	12	ns	51
CV %	—	4	2	2.6	1.4	0.4	5	4	61

Comments: This trial was conducted to look at the effect of Systiva seed treatment (BASF) with and without Quadris applied in a T-band in-furrow and foliar. This is the third year of testing Systiva in SBA trials. This trial had low to moderate disease pressure which led to a low amount of impact on yield and quality. In these trials, the best indicator of the treatment's performance against Rhizoctonia is the dead beet counts. All treatments that had Quadris were significantly better than the check (No Quadris/No Systiva) for dead beet counts. An interesting trend over 6 trials from the last 3 years has occurred in regard to tonnage. In any treatment that had Quadris applied (either in-furrow, foliar or both), the same treatment with Systiva yielded less than the Quadris only treatment in 13 of 14 comparisons. These yield differences are small and not statistically significant, but consistent. This spring, seedling injury from Systiva was seen in this trial. The damage was apparent on the cotyledon leaves and the plants seemed to grow out of the damage within about a week. The damage is the reason for the lower early emergence counts. It is possible that since the Systiva does not greatly improve disease control when Quadris is used, the injury early in the season may be causing some small yield loss. The in-furrow treatments had 6 oz/acre of Quadris with 4 oz of Mustang Max. The foliar treatments were 11.25 oz/acre of Quadris applied on 6/8 at the 8 leaf stage. Leafspot materials: 6/25 Proline + EBDC, 7/11 Super Tin + EBDC, 7/23 Enable + EBDC, 8/9 Manzate, 8/18 Super Tin + EBDC, 8/31 Inspire XT + EBDC, 9/11 SuperTin, 9/24 Badge. All included Masterlock.

$/A: Gross payment unless noted as net. Calculated assuming a $40 payment, an average RWST of 238.
Bold: Results are not statistically different from top ranking treatment in each column.

MICHIGAN STATE UNIVERSITY EXTENSION

Michigan State University AgBioResearch

Sugar Beet Field: Evaluation in-furrow Abamectin treatments at planting for nematode management.

Brian Levene[1], Brian Groulx[2], James Stewart[2] and Marisol Quintanilla[1],
[1]Michigan State University and [2]Michigan Sugar

Location: Akron, MI	**Treatment Timings:** In-Furrow Treatments
Planting Dates: May 17, 2018	**Treatments:** 3 (see table)
Soil Type: Clay Loam	**O.M.:** 3.4 **pH:** 7.3
Replicates: 6	**Variety:** C-RR059

Table 1. Yield parameters[a] of in-furrow Abamectin application programs, 2018.

Rating Type					RWSA		RWST		T/A		Sugar		CJP	
Rating Unit					lb suc/A		lb suc/T		Tons/A		%		%	
Trt No.	Treatment Name	Rate	Rate Unit	Appl Code	1		2		3		4		5	
1	Abamectin	3.47	fl oz/a	A	9530.6	a	227.9	a	41.83	a	15.75	a	94.46	a
2	Abamectin	6.94	fl oz/a	A	9215.3	ab	225.9	a	40.8	ab	15.42	a	95.15	a
3	Untreated Check				8696.5	b	221.3	a	39.3	b	15.35	a	94.38	a
Replicate F					1.031		0.699		0.97		0.263		0.375	
Replicate Prob(F)					0.4433		0.586		0.4659		0.8501		0.7746	
Treatment F					11.712		2.125		10.394		1.221		3.984	
Treatment Prob(F)					0.0085		0.2006		0.0112		0.3591		0.0793	

[a] Column values followed by the same letter are not significantly different based on Tukey's HSD (α=0.05); if no letter, then the effect is not significant.

Summary: There was a statistical difference observed in the yield data (Table 1). The low rate Abamectin achieved significantly greater yield than the untreated control but was only numerically greater than the high rate Abamectin treatment. The concentration of sugar in the beets as well as the quantity of sugar when could be extracted from the beets was statistically similar for all treatments. However, when all these factors are combined to determine the total amount of Raw White Sugar per Acre (RWSA) there were again statistical differences that favored the low-rate Abamectin over the untreated control.

Early season evaluations for plant vigor showed a slight numerical advantage for the Abamectin treatments over the untreated control. However, all vigor and plant population evaluations showed no significant differences among treatments. The plot area experienced little or no rain for most of June and July this season. Had there been more rainfall during this mid-season development period, the observed differences many have been greater.

Initial nematode evaluations from the plot area showed an average of 1.6 cyst, 174 eggs and just over 2 juvenile BCN per 100 cc of soil at the time of planting. The evaluations for BCN associated with each treatment at the time of harvest have not yet been completed.

MICHIGAN STATE UNIVERSITY EXTENSION

Michigan State University AgBioResearch

Sugar Beet Field: Evaluation in-furrow and/or foliar pesticide applications for nematode management.

Brian Levene[1], Brian Groulx[2], James Stewart[2] and Marisol Quintanilla[1],
[1]Michigan State University and [2]Michigan Sugar

Location: Akron, MI	**Treatment Timings:** In-Furrow Treatments
Planting Dates: May 17, 2018	**Treatments:** 6 (see table)
Soil Type: Clay Loam	**O.M.:** 3.4 **pH:** 7.3
Replicates: 6	**Variety:** C-RR059

Table 1. Yield parameters[a] of in-furrow and foliar applications of pesticides to control BCN in sugar beets, 2018.

Rating Type					RWSA		RWST		T/A		Sugar		CJP	
Rating Unit					lb suc/A		lb suc/T		Tons/A		%		%	
Trt	Treatment	Rate	Rate	Appl										
No.	Name		Unit	Code	1		2		3		4		5	
1	Untreated Check				8945.8	a	235.6	a	37.98	ab	16.15	a	94.74	a
2	Velum Prime	6.5	fl oz/a	A	8800	a	235.6	a	37.36	b	16.14	a	94.8	a
3	Propulse	13.6	fl oz/a	A	9144.7	a	233.2	a	39.19	a	15.94	a	94.96	a
4	Velum Prime	6.5	fl oz/a	A	9117.6	a	240.1	a	37.99	ab	16.46	a	94.67	a
	Movento HL	2.5	fl oz/a	C										
	Destiny HC	0.5	% v/v	C										
5	Propulse	13.6	fl oz/a	A	9238.1	a	236.2	a	39.12	a	16.08	a	95.13	a
	Movento HL	2.5	fl oz/a	C										
	Destiny HC	0.5	% v/v	C										
6	Movento HL	2.5	fl oz/a	B	8960.4	a	231.8	a	38.68	ab	15.86	a	94.9	a
	Destiny HC	0.5	% v/v	B										
	Movento HL	2.5	fl oz/a	C										
	Destiny HC	0.5	% v/v	C										
Replicate F					1.66		1.382		3.525		1.511		0.159	
Replicate Prob(F)					0.1812		0.2646		0.0151		0.2222		0.975	
Treatment F					1.593		0.916		5.505		1.098		0.508	
Treatment Prob(F)					0.1985		0.4866		0.0015		0.3861		0.7676	

[a] Column values followed by the same letter are not significantly different based on Tukey's HSD (α=0.05); if no letter, then the effect is not significant.
[b] Application Codes: A=in-furrow T-Band at planting, B=14 days after emergence, C=30 days after emergence

Summary: All sugar beet yields from the plots were statistically similar with two exceptions (Table 1). The application of Velum Prime followed by Movento/Destiny (Treatment 4) had lower yields than both treatments where Propulse was applied as a T-band at planting (Treatments 3&5). This Velum treatment had the lowest plant populations on all sample dates (data not presented). Potentially more of this treatment contacted the seed than for treatment #2 which began with the same applications. The Movento/Destiny application alone, and also when it was followed by Propulse, did not appear to reduce plant stands or plant vigor. Therefore, something unexpected may have happened for the Velum Prime applications at planting for treatment #4 which reduced the plant populations for this specific treatment and reduced yields. We do not believe that this treatment directly reduced the sugar beet stands and therefore the treatment yields.

Despite significant differences in the crop yields by treatment and numerical differences in the sugar concentration, the quantity of RWSA was statistically similar for all treatments. The untreated control and all chemical treatments achieved similar levels of sugar production on a per acre basis. Had there not been a period of moisture stress during July, the early season differences in plant vigor and even plant stands may have allowed for some greater treatment separation in these yield values.

Initial nematode evaluations from the plot area showed an average of 2.9 cyst, 265 eggs and just over 3 juvenile BCN per 100 cc of soil at the time of planting. The evaluations for BCN associated with each treatment at the time of harvest have not yet been completed.

MICHIGAN STATE UNIVERSITY EXTENSION

Michigan State University AgBioResearch

Sugar Beet Field: Evaluation of oilseed radish cover crop, pre-plant application timing /rate and in-furrow pesticide applications for nematode management.

Brian Levene[1], Brian Groulx[2], James Stewart[2] and Marisol Quintanilla[1],
[1]Michigan State University and [2]Michigan Sugar

Location: Akron, MI	**Treatment Timings:** Fall, spring and at planting
Planting Dates: May 17, 2018	**Treatments:** 3 (see table)
Soil Type: Clay Loam	**O.M.:** 3.4 **pH:** 7.3
Replicates: 6	**Variety:** C-RR059

Table 1. Yield parameters[a] comparing application timing, rates and placement of pesticides to control BCN in sugar beets, alone or in combination with oilseed radish cover crop, 2018.

Rating Type					RWSA		RWST		T/A		Sugar		CJP	
Rating Unit					lb suc/A		lb suc/T		Tons/A		%		%	
Trt	Treatment		Rate	Appl										
No.	Name	Rate	Unit	Code	1		2		3		4		5	
1	Untreated Check		0	0	8977	a	231.7	a	38.7	a	15.87	a	94.86	a
2	NIMITZ	3.5	pt/a	A	9086.1	a	233.4	a	38.9	a	15.97	a	94.92	a
	Defender Oilseed Radish	18	lb/a	B										
3	ADA 36380 (Fluensulfone)	4.4	pt/a	A	9285.3	a	232	a	40	a	15.98	a	94.55	a
	Defender Oilseed Radish	18	lb/a	B										
4	Defender Oilseed Radish	18	lb/a	B	9393	a	237.7	a	39.5	a	16.26	a	94.85	a
5	NIMITZ	3.5	pt/a	A	9050.1	a	234.9	a	38.5	a	16.07	a	94.87	a
6	ADA 36380 (Fluensulfone)	4.4	pt/a	A	9287.2	a	238.5	a	38.9	a	16.33	a	94.75	a
7	NIMITZ	7	pt/a	A	9288	a	233.7	a	39.7	a	16.06	a	94.65	a
8	ADA 36380 (Fluensulfone)	8.8	pt/a	A	9343.7	a	234.5	a	39.9	a	15.98	a	95.07	a
9	NIMITZ	3.5	pt/a	C	9225.6	a	234.7	a	39.3	a	16.07	a	94.82	a
10	ADA 36380 (Fluensulfone)	4.4	pt/a	C	9286.8	a	235.6	a	39.4	a	16.15	a	94.76	a
11	NIMITZ	0.8	pt/a	D	8943.5	a	227.7	a	39.3	a	15.68	a	94.65	a
12	ADA 36380 (Fluensulfone)	1	pt/a	D	9313	a	232.4	a	40.1	a	16.02	a	94.51	a
Replicate F					1.854		2.09		1.244		2.028		1.402	
Replicate Prob(F)					0.1175		0.0804		0.3014		0.0889		0.238	
Treatment F					0.45		0.973		0.358		0.765		1.385	
Treatment Prob(F)					0.9251		0.481		0.9666		0.6722		0.2062	

[a] Column values followed by the same letter are not significantly different based on Tukey's HSD (α=0.05); if no letter, then the effect is not significant.
[b] Application Codes: A=PPI August 2017, B=drill Aug 2017, C=PPI 3 days prior to planting, D=In-furrow at planting.

Summary: Despite a difference as large as 450 lbs./acre in RWSA between two treatments, there were no statistical differences between any of the treatments imposed. Still, there was a trend for the ADA-based treatments to have slightly greater yields than the respective Nimitz based treatments. Additionally, the yield for all the ADA-based treatments were fairly similar regardless of application rate or timing of application. There were greater differences among the Nimitz-based treatments for sugar beet yield/quality.

The use of Defender Oilseed Radish enhanced the overall sugar yield when it was compared to the same respective treatment without any radish. Product pricing was not included for the radish seed, so it is uncertain if the advantage would have been profitable investment strictly based on yield enhancement.

Initial nematode evaluations from the plot area at the time of planting in the spring showed an average of 1 cyst, 90 eggs and just over 2 juvenile BCN per 100 cc of soil at the time of planting. The evaluations for BCN associated with each treatment at the time of harvest have not yet been completed.

Evaluate Application Methods for Applying Nitrogen on Sugarbeets
Blumfield West, Richville, MI - 2018

Trial Quality: Good
Variety: C-675
Planted: April 27
Harvested: Sept 24
Plots: 6 rows X 38 ft, 4 reps
Row Spacing: 22 inches

Soil Info: Clay Loam
% OM: 2.9 **pH:** 7.1 **CEC:** 16.4
P: above opt **K:** above opt
Mn: high **B:** med
Added N: 135 lbs.
Prev Crop: Rye

Rhizoc Level: Low
Cerc Control: Good
Problems: None
Seeding Rate: 4.5 inches
Rainfall: 22.3 inches

Application: 2X2 on planter, 4 lf stage incorporated with fluted coulter (between rows)

No.	Treatment	Applic Timing	Rate/A	Net $/A	RWSA	RWST	T/A	% SUC	% CJP
3	UAN 28% Redline	PPI In-Fur	40 gal 3 gal	**$1,417 a**	**9203 a**	**254 ab**	**36.2 a-d**	**17.1 abc**	95.5
17	UAN 28% UAN 28%	2X2 F. Coulter	13.3 gal 26.7 gal	**$1,393 ab**	**8991 ab**	240 h	**37.5 a**	16.4 fg	95.0
18	Redline UAN 28% UAN 28%	In-Fur 2X2 F. Coulter	3 gal 13.3 gal 26.1 gal	**$1,372 abc**	**8924 abc**	242 fgh	**36.9 ab**	16.5 d-g	95.0
19	Redline UAN 28% UAN 28%	In-Fur 2X2 F. Coulter	3 gal 13.3 gal 26.1 gal	**$1,371 abc**	**8923 abc**	243 d-h	**36.7 abc**	16.5 c-g	95.1
14	10-34-0 UAN 28%	In-Fur F. Coulter	3 gal 39.8 gal	**$1,365 abc**	**8851 abc**	245 b-h	**36.1 a-d**	16.6 b-g	95.2
1	UAN 28%	PPI	40 gal	**$1,357 a-d**	**8772 a-e**	245 b-h	**35.9 a-d**	16.5 c-g	95.4
16	Soyshot UAN 28%	In-Fur F. Coulter	3 gal 40 gal	**$1,352 a-d**	**8804 a-d**	**248 a-h**	**35.5 a-e**	**16.7 a-g**	95.4
5	UAN 28% Levesol	PPI In-Fur	40 gal 64 fl oz	**$1,344 a-e**	**8755 a-e**	**247 a-h**	**35.4 a-e**	**16.7 a-g**	95.2
21	Levesol UAN 28% UAN 28%	In-Fur 2X2 F. Coulter	64 fl oz 13.3 gal 26.1 gal	**$1,344 a-e**	**8754 a-e**	246 b-h	**35.6 a-d**	**16.7 a-g**	95.0
4	UAN 28% 10-34-0	PPI In-Fur	40 gal 3 gal	**$1,338 a-e**	**8682 a-f**	243 d-h	**35.7 a-d**	16.4 efg	95.4
11	UAN 28% UAN 28% UAN 28%	PPI 2X2 F. Coulter	20 gal 13.3 gal 6.7 gal	**$1,332 a-e**	**8616 a-f**	**252 a-e**	**34.2 a-f**	**17.0 a-e**	95.5
22	Soyshot UAN 28% UAN 28%	In-Fur 2X2 F. Coulter	3 gal 13.3 gal 26.1 gal	**$1,321 a-e**	**8613 a-f**	**247 a-h**	**34.9 a-f**	**16.8 a-g**	95.1
2	UAN 28% Redline	PPI In-Fur	40 gal 3 gal	**$1,319 a-e**	**8601 a-f**	**247 a-h**	**34.8 a-f**	**16.8 a-g**	95.1
26	UAN 28% UAN 28%	2X2 7 Stream	13.3 gal 26.7 gal	**$1,318 a-e**	**8531 a-f**	**252 a-d**	33.8 b-g	**17.1 a-d**	95.2

Means followed by the same letter are not significantly different. Duncans New MRT 5%.

Net $/A: Assume a $40 beet payment and trial average RWST.

Fertilizer costs are incorporated into Net $/A.

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

Evaluate Application Methods for Applying Nitrogen on Sugarbeets
Blumfield West, Richville, MI - 2018

No.	Treatment	Applic Timing	Rate/A	Net $/A	RWSA	RWST	T/A	% SUC	% CJP
6	UAN 28% Soyshot	PPI In-Fur	40 gal 2 gal	**$1,318 a-e**	**8590 a-f**	244 c-h	**35.2 a-e**	16.6 b-g	95.0
7	UAN 28% UAN 28%	PPI 2X2	26.7 gal 13.3 gal	**$1,313 a-e**	**8500 a-g**	**248 a-h**	**34.2 a-f**	**16.8 a-g**	95.3
13	Redline UAN 28%	In-Fur F. Coulter	3 gal 39.5 gal	**$1,312 a-e**	**8557 a-f**	246 b-h	**34.8 a-f**	16.6 b-g	95.3
15	Levesol UAN 28%	In-Fur F. Coulter	64 fl oz 39.8 gal	**$1,310 a-e**	**8543 a-f**	**253 a-d**	33.9 b-g	**17.1 ab**	95.0
20	10-34-0 UAN 28% UAN 28%	In-Fur 2X2 F. Coulter	3 gal 13.3 gal 26.1 gal	$1,278 b-f	8313 b-h	243 e-h	**34.3 a-f**	16.4 efg	95.4
10	UAN 28% UAN 28% Agrotain Plus	PPI 7 Stream 7 Stream	20 gal 20 gal 1.66 lb	$1,277 b-f	8274 b-h	**249 a-h**	33.3 c-h	**16.9 a-f**	95.1
27	UAN 28% UAN 28% Agrotain Plus	2X2 7 Stream 7 Stream	13.3 gal 26.7 gal 2.21 lb	$1,264 b-g	8228 b-h	**250 a-g**	33.0 d-h	**16.9 a-f**	95.2
8	UAN 28% UAN 28%	PPI F. Coulter	20 gal 20 gal	$1,251 c-g	8117 c-h	242 gh	33.7 b-g	16.3 g	95.5
9	UAN 28% UAN 28%	PPI 7 Stream	20 gal 20 gal	$1,232 d-g	7999 d-h	**250 a-g**	32.0 e-h	**16.9 a-f**	95.2
24	UAN 28%	7 Stream	40 gal	$1,228 d-g	7971 e-h	**252 a-f**	31.7 fgh	**16.9 a-f**	95.5
12	Redline UAN 28%	In-Fur F. Coulter	3 gal 39.4 gal	$1,226 d-g	8023 d-h	244 c-h	32.9 d-h	16.6 b-g	95.2
23	UAN 28%	F. Coulter	40 gal	$1,219 efg	7915 fgh	**247 a-h**	32.1 e-h	**16.8 a-g**	95.0
29	UAN 28% Redline	2X2 In-Fur	12.6 gal 3 gal	$1,218 efg	7724 ghi	**252 a-d**	30.7 ghi	**17.0 a-d**	95.3
28	UAN 28%	2X2	13.3 gal	$1,181 fg	7681 hi	**256 a**	30.0 hi	**17.3 a**	95.3
25	UAN 28% Agrotain Plus	7 Stream 7 Stream	40 gal 3.32 lb	$1,152 fg	7532 hi	**247 a-h**	30.5 ghi	**16.8 a-g**	95.1
30	Untreated Check			$1,141 g	7066 i	**253 abc**	27.9 i	**17.1 ab**	95.1

Average	$1,295.5	8401.7	247.6	33.98	16.76	95.21
LSD 5%	107.2	663.5	7.6	2.82	0.46	n.s.
CV %	7.3	6.9	2.7	7.3	2.4	0.5

Means followed by the same letter are not significantly different. Duncans New MRT 5%.

Comments: Nitrogen was applied PPI, 2X2 and 6 lf. Some of the 6 lf treatments were applied with a fluted coulter between the rows and some were applied foliar with streamer nozzles. The total nitrogen rate for most of the treatments was 120 lbs ai/A. PPI and PPI followed by 2X2 treatments trended toward the top of the trial. Applying all of the nitrogen at the 6 lf stage resulted in lower yields. Nitrogen (UAN 28%) applied with streamer nozzles caused minor leaf spotting but symptoms were short lived. None of the treatments caused sugarbeet stand loss.

Net $/A: Assume a $40 beet payment and trial average RWST.

Fertilizer costs are incorporated into Net $/A.

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

Evaluate Appication Methods for Applying Nitrogen on Sugarbeets
Blumfield West, Richville, MI - 2018

No.	Treatment	Applic Timing	Rate/A	Net $/A	Injury 0-10 7-Jun	Vigor 0-10 7-Sep	Size 0-10 9-Aug	Color 0-10 9-Aug	Beets/ 100 ft 7-Jun
3	UAN 28% Redline	PPI In-Fur	40 gal 3 gal	**$1,417 a**	**0.0 b**	7.8 fg	**7.1 ab**	**7.3 a**	180.3
17	UAN 28% UAN 28%	2X2 F. Coulter	13.3 gal 26.7 gal	**$1,393 ab**	**0.0 b**	**8.5 a-e**	**8.1 a**	**8.2 a**	189.5
18	Redline UAN 28% UAN 28%	In-Fur 2X2 F. Coulter	3 gal 13.3 gal 26.1 gal	**$1,372 abc**	**0.0 b**	**8.5 a-e**	**7.9 a**	**7.3 a**	180.5
19	Redline UAN 28% UAN 28%	In-Fur 2X2 F. Coulter	3 gal 13.3 gal 26.1 gal	**$1,371 abc**	**0.0 b**	**8.8 ab**	**8.3 a**	**8.2 a**	178.8
14	10-34-0 UAN 28%	In-Fur F. Coulter	3 gal 39.8 gal	**$1,365 abc**	**0.0 b**	**8.3 a-g**	**7.6 a**	**8.2 a**	190.0
1	UAN 28%	PPI	40 gal	**$1,357 a-d**	**0.0 b**	8.2 b-g	**7.9 a**	**7.3 a**	180.5
16	Soyshot UAN 28%	In-Fur F. Coulter	3 gal 40 gal	**$1,352 a-d**	**0.0 b**	**8.5 a-e**	**7.4 ab**	**8.2 a**	186.0
5	UAN 28% Levesol	PPI In-Fur	40 gal 64 fl oz	**$1,344 a-e**	**0.0 b**	8.2 b-g	**7.9 a**	**7.3 a**	176.0
21	Levesol UAN 28% UAN 28%	In-Fur 2X2 F. Coulter	64 fl oz 13.3 gal 26.1 gal	**$1,344 a-e**	**0.0 b**	8.2 b-g	**7.9 a**	**7.0 a**	187.2
4	UAN 28% 10-34-0	PPI In-Fur	40 gal 3 gal	**$1,338 a-e**	**0.0 b**	7.8 fg	**7.1 ab**	**7.3 a**	177.2
11	UAN 28% UAN 28% UAN 28%	PPI 2X2 F. Coulter	20 gal 13.3 gal 6.7 gal	**$1,332 a-e**	**0.0 b**	**8.8 a**	**8.1 a**	**7.9 a**	186.3
22	Soyshot UAN 28% UAN 28%	In-Fur 2X2 F. Coulter	3 gal 13.3 gal 26.1 gal	**$1,321 a-e**	**0.0 b**	**8.5 a-e**	**8.3 a**	**7.3 a**	180.3
2	UAN 28% Redline	PPI In-Fur	40 gal 3 gal	**$1,319 a-e**	**0.0 b**	**8.3 a-g**	**7.9 a**	**7.0 a**	187.0
26	UAN 28% UAN 28%	2X2 7 Stream	13.3 gal 26.7 gal	**$1,318 a-e**	1.7 a	**8.3 a-f**	**7.6 a**	**7.3 a**	194.8

Means followed by the same letter are not significantly different. Duncans New MRT 5%.

Net $/A: Assume a $40 beet payment and trial average RWST.

Fertilizer costs are incorporated into Net $/A.

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

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Evaluate Application Methods for Applying Nitrogen on Sugarbeets

Blumfield West, Richville, MI - 2018

No.	Treatment	Applic Timing	Rate/A	Net $/A	Injury 0-10	Vigor 0-10	Size 0-10	Color 0-10	Beets/ 100 ft
					7-Jun	7-Sep	9-Aug	9-Aug	7-Jun
6	UAN 28% Soyshot	PPI In-Fur	40 gal 2 gal	**$1,318 a-e**	**0.0 b**	8.0 d-g	**7.1 ab**	**7.9 a**	172.7
7	UAN 28% UAN 28%	PPI 2X2	26.7 gal 13.3 gal	**$1,313 a-e**	**0.0 b**	8.0 d-g	**7.6 a**	**7.3 a**	180.3
13	Redline UAN 28%	In-Fur F. Coulter	3 gal 39.5 gal	**$1,312 a-e**	**0.0 b**	**8.8 a**	**7.9 a**	**7.9 a**	194.0
15	Levesol UAN 28%	In-Fur F. Coulter	64 fl oz 39.8 gal	**$1,310 a-e**	**0.0 b**	**8.3 a-f**	**7.6 a**	**7.3 a**	186.3
20	10-34-0 UAN 28% UAN 28%	In-Fur 2X2 F. Coulter	3 gal 13.3 gal 26.1 gal	$1,278 b-f	**0.0 b**	**8.7 abc**	**7.6 a**	**7.3 a**	181.3
10	UAN 28% UAN 28% Agrotain	PPI 7 Stream 7 Stream	20 gal 20 gal 1.66 lb	$1,277 b-f	1.8 a	8.1 c-g	**7.4 ab**	**7.3 a**	191.0
27	UAN 28% UAN 28% Agrotain	2X2 7 Stream 7 Stream	13.3 gal 26.7 gal 2.21 lb	$1,264 b-g	1.8 a	**8.4 a-f**	**7.1 ab**	**7.6 a**	192.5
8	UAN 28% UAN 28%	PPI F. Coulter	20 gal 20 gal	$1,251 c-g	**0.0 b**	**8.6 a-d**	**7.6 a**	**7.3 a**	194.5
9	UAN 28% UAN 28%	PPI 7 Stream	20 gal 20 gal	$1,232 d-g	1.7 a	7.8 fg	**7.1 ab**	**7.0 a**	179.7
24	UAN 28%	7 Stream	40 gal	$1,228 d-g	1.8 a	**8.4 a-f**	**7.1 ab**	**7.3 a**	186.2
12	Redline UAN 28%	In-Fur F. Coulter	3 gal 39.4 gal	$1,226 d-g	**0.0 b**	**8.3 a-g**	**8.3 a**	**7.3 a**	190.0
23	UAN 28%	F. Coulter	40 gal	$1,219 efg	**0.0 b**	**8.4 a-f**	**7.9 a**	**7.6 a**	183.0
29	UAN 28% Redline	2X2 In-Fur	12.6 gal 3 gal	$1,218 efg	**0.0 b**	7.7 g	**7.1 ab**	5.5 b	192.5
28	UAN 28%	2X2	13.3 gal	$1,181 fg	**0.0 b**	7.9 efg	6.2 bc	5.5 b	203.2
25	UAN 28% Agrotain	7 Stream 7 Stream	40 gal 3.32 lb	$1,152 fg	1.8 a	**8.5 a-e**	**7.6 a**	**7.3 a**	183.0
30	Untreated Check			$1,141 g	**0.0 b**	7.2 h	5.7 c	4.2 c	185.8
	Average			$1,295.5	0.36	8.26	7.54	7.22	185.68
	LSD 5%			107.2	0.26	0.48	1.06	0.97	16.84
	CV %			7.3	64.2	5.1	12.3	11.8	8.0

Means followed by the same letter are not significantly different. Duncans New MRT 5%.

Net $/A: Assume a $40 beet payment and trial average RWST.

Fertilizer costs are incorporated into Net $/A.

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

Effect of Nitrogen Rates on Grower Income, Yield and Quality when Harvested Early, Mid and Late Season
Average of 4 years, 5 Trials (2014 - 2018)

Nitrogen Rate Effect (Average of Harvest Dates and Locations)

No.	N. Rate lb ai/A	Net $/A	Net $/T	RWSA	RWST	T/A	% SUC	% CJP	Canopy Closure %	Canopy Color 0-10
5	160	**$1,496 a**	$51.7 d	**8431 a**	265 b	**31.9 a**	17.8 b	95.4 b	**87 a**	7.9 b
3	80	**$1,454 ab**	$52.6 c	8037 b	265 b	30.2 b	17.8 b	95.2 cd	82 b	8.0 b
4	120	**$1,440 ab**	$51.7 d	**8125 ab**	262 cd	**31.0 ab**	17.8 b	95.0 e	83 b	8.2 b
6	200	$1,410 b	$50.9 e	**8160 ab**	264 bc	**31.0 ab**	17.8 b	95.3 bc	**88 a**	8.0 b
7	240	$1,402 b	$49.9 f	**8258 ab**	261 d	**31.8 a**	17.6 c	95.1 d	**88 a**	**8.7 a**
2	40	$1,228 c	**$55.3 a**	6645 c	**275 a**	24.2 c	**18.3 a**	**95.7 a**	77 c	5.1 c
1	0	$934 d	$54.2 b	4976 d	266 b	18.6 d	17.7 bc	**95.7 a**	66 d	4.2 d

Average	$1,337.7	$52.32	7518.9	265.4	28.36	17.83	95.34	81.6	7.16
LSD 5%	61.2	0.49	338.5	2.4	1.30	0.15	0.13	2.4	0.4
CV %	13.6	2.8	13.4	2.6	13.6	2.5	0.4	8.8	17.2

Harvest Date Effect (Average of Nitrogen Rates and Locations)

No.	Harvest Date	Net $/A	Net $/T	RWSA	RWST	T/A	% SUC	% CJP	Canopy Closure %	Canopy Color 0-10
2	Oct 1	**$1,395 a**	$52.5 b	7528 b	269 b	28.5 b	18.1 b	95.3 b	**82.0 a**	7.2
1	Sep 1	$1,331 b	**$63.4 a**	5449 c	244 c	22.5 c	16.7 c	94.8 c	80.7 b	7.2
3	Nov 1	$1,288 c	$41.1 c	**9580 a**	**284 a**	**34.1 a**	**18.8 a**	**95.9 a**	**82.0 a**	7.3

Average	$1,337.7	$52.32	7519.0	265.4	28.36	17.83	95.34	81.60	7.16
LSD 5%	27.7	1.12	353.3	4.0	0.97	0.22	0.13	0.85	n.s.
CV %	9.7	10.04	21.9	7.0	16.0	5.8	0.6	4.8	9.7

Means followed by the same letter are not significantly different. Duncans New MRT 5%.

Comments: Five small plot replicated nitrogen rate X harvest date sugarbeet trials were conducted in the Michigan Sugar Company growing region from 2014 to 2018. The nitrogen rates utilized were: 0, 40, 80, 120, 160, 200 and 240 lbs N ai/Acre. Nitrogen (28% N) was applied 2X2 (40 lbs) at planting with the remainder applied at the 4-6 leaf stage with a fluted coulter. The harvest dates were Sept 1, Oct 1 and Nov 1. Sugarbeet yields increased significantly from 0 to 80 lbs N, however, yields were similar among the 120, 160, 200 and 240 lb N rates. Sugar content was the highest with the 40 lb N rate and lowest with the 240 lb N rate. With respect to harvest date; yields and sugar content were highest with the Nov 1 harvest, followed by Oct 1 and Sept 1. However, net grower payment (with early harvest incentives) did not follow sugarbeet yields. Around 120 lbs N provided the highest payment (160 lbs N followed by 80 lbs and 120 lbs). The payment was somewhat lower with the high nitrogen rates (200 and 240 lbs). The 0 and 40 lb N rates had the lowest payment. Oct 1 had the highest payment followed by Sept 1 and Nov 1. The percent canopy closure and level of canopy green color increased with nitrogen rates. The trials had favorable sugarbeet stands (around 170 beets/100 ft) and low disease levels.

Net $/A: Assume a $40 beet payment and trial average RWST.

Early Delivery Incentive, Freight costs and Fertilizer costs are all incorporated into Net $/A.

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

Effect of Nitrogen Rates on Grower Income, Yield and Quality when Harvested Early, Mid and Late Season

Average of 4 years, 5 Trials (2014 - 2018)

Nitrogen Rate and Harvest Date

No.	N. Rate lb ai/A	Harvest Date	Net $/A	Net $/T	RWSA	RWST	T/A	% Sugar
5	160	1-Sep	$1,521	$62.3	6395	246	26.3	16.7
4	120	1-Sep	$1,426	$62.4	5976	244	24.3	16.8
6	200	1-Sep	$1,423	$60.8	6149	242	25.7	16.5
3	80	1-Sep	$1,420	$63.0	5775	244	23.7	16.7
7	240	1-Sep	$1,398	$59.8	6149	241	25.8	16.5
2	40	1-Sep	$1,258	$68.7	4625	251	18.7	17.0
1	0	1-Sep	$868	$66.6	3072	239	12.9	16.3
Average			$1,330.6	$63.37	5448.7	243.9	22.49	16.64

No.	N. Rate lb ai/A	Harvest Date	Net $/A	Net $/T	RWSA	RWST	T/A	% Sugar
3	80	1-Oct	$1,564	$53.4	8264	269	30.9	18.1
5	160	1-Oct	$1,563	$51.9	8439	266	32.2	17.9
4	120	1-Oct	$1,505	$51.9	8058	263	31.2	17.9
7	240	1-Oct	$1,478	$50.9	8296	267	31.6	18.0
6	200	1-Oct	$1,449	$51.4	8016	267	30.7	18.0
2	40	1-Oct	$1,235	$54.3	6577	279	24.1	18.5
1	0	1-Oct	$974	$53.5	5044	271	19.0	18.0
Average			$1,395.4	$52.47	7527.7	268.9	28.53	18.06

No.	N. Rate lb ai/A	Harvest Date	Net $/A	Net $/T	RWSA	RWST	T/A	% Sugar
5	160	1-Nov	$1,405	$40.9	10459	283	37.2	18.7
4	120	1-Nov	$1,390	$40.8	10340	279	37.4	18.6
3	80	1-Nov	$1,378	$41.3	10073	281	36.0	18.7
6	200	1-Nov	$1,359	$40.7	10317	284	36.6	18.8
7	240	1-Nov	$1,329	$38.8	10328	275	37.8	18.4
2	40	1-Nov	$1,190	$42.8	8734	294	29.8	19.3
1	0	1-Nov	$961	$42.4	6811	288	23.7	18.9
Average			$1,287.4	$41.10	9580.3	283.4	34.07	18.77
LSD 5%			73.3	2.98	934.6	10.5	2.58	0.58
CV %			9.7	10.0	21.9	7.0	16.0	5.8

Net $/A: Assume a $40 beet payment and trial average RWST.

Early Delivery Incentive, Freight costs and Fertilizer costs are all incorporated into Net $/A.

Effect of Nitrogen Rates on Grower Income, Yield and Quality when Harvested Early, Mid and Late Season

4 years, 5 Trials (2014 - 2018)

Nitrogen Rate and Year of Trial

No.	N. Rate lb ai/A	Year	Net $/A	Net $/T	RWSA	RWST	T/A	% Sugar
5	160	2015	$1,791	$60.0	8078	266	30.2	17.6
7	240	2015	$1,693	$58.1	7864	265	29.5	17.6
6	200	2015	$1,583	$59.5	7344	268	27.1	17.8
3	80	2015	$1,549	$62.3	6771	269	25.2	17.8
4	120	2015	$1,505	$63.5	6724	279	24.0	18.3
2	40	2015	$1,337	$65.2	5722	278	20.5	18.4
1	0	2015	$1,098	$65.7	4813	275	17.2	18.1

No.	N. Rate lb ai/A	Year	Net $/A	Net $/T	RWSA	RWST	T/A	% Sugar
5	160	2016	$1,309	$42.2	7913	239	32.3	16.2
4	120	2016	$1,296	$42.1	7799	235	32.4	16.0
3	80	2016	$1,285	$44.4	7555	245	30.1	16.5
6	200	2016	$1,275	$41.9	7869	240	32.1	16.3
2	40	2016	$1,270	$47.6	7330	256	27.9	17.1
7	240	2016	$1,258	$40.2	7843	235	32.8	16.0
1	0	2016	$941	$47.6	5430	251	20.9	16.8

No.	N. Rate lb ai/A	Year	Net $/A	Net $/T	RWSA	RWST	T/A	% Sugar
5	160	2017 A	$1,340	$59.2	8129	301	26.8	20.1
4	120	2017 A	$1,292	$56.5	7832	287	27.2	19.5
3	80	2017 A	$1,264	$57.1	7619	291	26.0	19.6
6	200	2017 A	$1,254	$58.3	7692	297	25.8	19.9
7	240	2017 A	$1,180	$58.5	7507	298	25.1	19.9
2	40	2017 A	$990	$59.9	5925	304	19.4	20.1
1	0	2017 A	$683	$56.8	4012	290	13.7	19.2

No.	N. Rate lb ai/A	Year	Net $/A	Net $/T	RWSA	RWST	T/A	% Sugar
3	80	2017 B	$1,359	$51.7	8243	265	30.7	18.2
4	120	2017 B	$1,241	$50.6	7753	259	29.5	18.0
7	240	2017 B	$1,200	$52.6	7725	268	28.7	18.4
6	200	2017 B	$1,169	$53.7	7421	275	26.6	18.7
5	160	2017 B	$1,131	$54.0	7075	276	25.5	18.6
2	40	2017 B	$953	$54.1	5717	276	20.6	18.6
1	0	2017 B	$538	$49.8	3303	256	12.6	17.2

No.	N. Rate lb ai/A	Year	Net $/A	Net $/T	RWSA	RWST	T/A	% Sugar
5	160	2018	$1,909	$43.2	10961	244	44.7	16.4
4	120	2018	$1,868	$45.8	10515	251	41.6	16.9
3	80	2018	$1,814	$47.2	9998	253	39.1	17.0
6	200	2018	$1,772	$41.4	10476	241	43.2	16.2
7	240	2018	$1,677	$39.8	10350	240	42.6	16.2
2	40	2018	$1,588	$49.6	8534	259	32.6	17.4
1	0	2018	$1,412	$50.8	7320	257	28.3	17.2

LSD 5%	96.6	2.1	754.2	9.0	2.34	0.50
CV %	10.1	5.52	14.0	4.7	11.5	3.9

Net $/A: Assume a $40 beet payment and trial average RWST.
Early Delivery Incentive, Freight costs and Fertilizer costs are all incorporated into Net $/A.

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Effect of Nitrogen Rates on Grower Income, Yield and Quality when Harvested Early, Mid and Late Season

Blumfield West, Richville - 2018

Trial Quality: Good
Variety: C-675
Planted: April 26
Harvested: Sept 1, Oct 1, Nov 1
Plots: 6 rows X 38 ft, 4 reps
Row Spacing: 22 inches

Soil Info: Clay Loam
% OM: 2.9 **pH:** 7.1 **CEC:** 16.4
P: above opt **K**: above opt
Mn: high **B:** med
Added N: See trts.
Prev Crop: Rye

Rhizoc Level: Low
Cerc Control: Good
Problems: None
Seeding Rate: 4.5 inches
Rainfall: 22.3 inches

Application: 2X2 on planter, 4 lf stage incorporated with fluted coulter (between rows)

No.	Nitrogen Rate* Lb ai/Acre			Harvest Date	Net $/A		Net $/T		RWSA		RWST		T/A		% SUC		% CJP	
	Total	2X2	4-6 lf															
8	80	40	40	1-Oct	**$2,029**	**a**	$47	fg	11271	c	259	d	43.6	bc	17.2	e	96.0	bcd
13	160	40	120	1-Sep	**$2,017**	**ab**	$50	d	8396	def	209	h	40.1	d	14.7	j	94.1	e
10	120	40	80	1-Sep	**$1,937**	**abc**	$56	c	7837	fg	226	fg	34.6	fg	15.7	hi	94.3	e
14	160	40	120	1-Oct	**$1,931**	**a-d**	$42	hi	11283	c	245	e	**46.0**	**abc**	16.4	f	95.9	cd
11	120	40	80	1-Oct	**$1,896**	**a-e**	$43	h	10853	c	245	e	44.3	bc	16.5	f	95.6	d
16	200	40	160	1-Sep	$1,864	b-e	$48	ef	8027	efg	207	h	38.7	de	14.5	j	94.3	e
17	200	40	160	1-Oct	$1,840	c-f	$41	ij	11037	c	244	e	**45.2**	**abc**	16.3	fg	95.9	cd
20	240	40	200	1-Oct	$1,801	c-g	$40	jk	11072	c	244	e	**45.4**	**abc**	16.4	fg	95.7	d
7	80	40	40	1-Sep	$1,771	d-h	$56	c	7008	hi	221	g	31.7	h	15.4	i	94.2	e
15	160	40	120	1-Nov	$1,757	e-h	$36	lm	**13132**	**a**	272	c	**48.2**	**a**	17.9	cd	**96.4**	**ab**
12	120	40	80	1-Nov	$1,737	e-h	$38	kl	**12695**	**ab**	**279**	**abc**	**45.6**	**abc**	**18.4**	**abc**	96.2	bcd
9	80	40	40	1-Nov	$1,691	f-i	$39	jk	12095	b	**282**	**ab**	43.0	c	**18.5**	**ab**	**96.2**	**abc**
4	40	40	0	1-Sep	$1,653	g-j	$60	b	6337	ij	229	fg	27.6	i	15.9	ghi	94.3	e
18	200	40	160	1-Nov	$1,637	g-j	$36	m	**12585**	**ab**	273	bc	**46.1**	**abc**	18.0	cd	**96.4**	**ab**
5	40	40	0	1-Oct	$1,620	hij	$48	f	8838	d	260	d	34.0	fgh	17.3	e	95.9	bcd
21	240	40	200	1-Nov	$1,618	hij	$35	m	**12722**	**ab**	273	bc	**46.5**	**ab**	18.1	bcd	96.2	bcd
19	240	40	200	1-Sep	$1,609	hij	$45	g	7271	gh	203	h	35.8	f	14.3	j	94.0	e
1	0	0	0	1-Sep	$1,540	ijk	**$63**	**a**	5695	j	231	f	24.6	j	16.0	fgh	94.5	e
6	40	40	0	1-Nov	$1,509	jk	$41	hij	10560	c	**287**	**a**	36.9	ef	**18.8**	**a**	**96.3**	**abc**
2	0	0	0	1-Oct	$1,415	kl	$50	de	7492	gh	263	d	28.5	i	17.6	de	95.7	d
3	0	0	0	1-Nov	$1,282	l	$40	ij	8772	de	276	bc	31.8	gh	18.0	bcd	96.7	a

Average	$1,721.6	$45.3	9760.9	249.0	38.97	16.75	95.46
LSD 5%	144.8	1.7	724.4	8.2	2.72	0.47	0.46
CV %	6.6	3.0	5.9	2.6	5.5	2.2	0.4

Means followed by the same letter are not significantly different. Duncans New MRT 5%.

*** Nitrogen Rate:** Nitrogen at planting (2X2) = 8 gal 28% N, 6 gal 10-34-0 and 4 gal ThioSul for a total of 40 lbs ai/A at planting, and at the 4 lf stage 28% N was the source, applied between rows with fluted coulter.

Net $/A: Assume a $40 beet payment and Company average RWST.

Early Delivery Incentive, Freight costs and Fertilizer costs are all incorporated into Net $/A.
Bold: Results are not statistically different from top-ranking treatment in each column.

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Effect of Nitrogen Rates on Grower Income, Yield and Quality when Harvested Early, Mid and Late Season

Blumfield West, Richville - 2018

No.	Nitrogen Rate* Lb ai/Acre			Harvest Date	Net $/A	Net $/T	Live Beets/	Dead Beets/	Vigor**	Color	Size
	Total	2X2	4-6 lf				100 ft	100 ft	0-10		
8	80	40	40	1-Oct	**$2,029 a**	$47 fg	178	0.7	8.4 bc	7.0 bcd	**7.4 abc**
13	160	40	120	1-Sep	**$2,017 ab**	$50 d	176	0.7	8.4 bc	6.7 cd	**8.3 a**
10	120	40	80	1-Sep	**$1,937 abc**	$56 c	183	0.5	8.2 c	7.0 bcd	6.9 bcd
14	160	40	120	1-Oct	**$1,931 a-d**	$42 hi	174	1.2	**8.9 ab**	**7.3 abc**	**8.0 ab**
11	120	40	80	1-Oct	**$1,896 a-e**	$43 h	171	0.7	8.5 bc	6.7 cd	**7.4 abc**
16	200	40	160	1-Sep	$1,864 b-e	$48 ef	181	0.7	**9.1 a**	**7.7 abc**	**8.6 a**
17	200	40	160	1-Oct	$1,840 c-f	$41 ij	171	0.2	**9.0 ab**	**7.7 abc**	**8.6 a**
20	240	40	200	1-Oct	$1,801 c-g	$40 jk	174	0.5	**8.6 abc**	**8.3 a**	**8.0 ab**
7	80	40	40	1-Sep	$1,771 d-h	$56 c	173	1.0	8.5 bc	**7.3 abc**	6.9 bcd
15	160	40	120	1-Nov	$1,757 e-h	$36 lm	170	0.3	8.5 bc	**7.3 abc**	**8.0 ab**
12	120	40	80	1-Nov	$1,737 e-h	$38 kl	170	1.0	8.0 cd	**7.3 abc**	6.9 bcd
9	80	40	40	1-Nov	$1,691 f-i	$39 jk	169	1.0	8.1 cd	**7.7 abc**	**7.4 abc**
4	40	40	0	1-Sep	$1,653 g-j	$60 b	174	0.9	7.6 de	4.3 f	6.0 d
18	200	40	160	1-Nov	$1,637 g-j	$36 m	176	1.5	**9.0 ab**	7.0 bcd	**8.3 a**
5	40	40	0	1-Oct	$1,620 hij	$48 f	174	0.7	7.4 ef	4.7 f	6.6 cd
21	240	40	200	1-Nov	$1,618 hij	$35 m	174	1.0	8.5 bc	**8.0 ab**	**7.7 abc**
19	240	40	200	1-Sep	$1,609 hij	$45 g	180	0.7	**8.6 abc**	**8.3 a**	**7.4 abc**
1	0	0	0	1-Sep	$1,540 ijk	**$63 a**	173	0.2	7.2 ef	4.7 f	6.6 cd
6	40	40	0	1-Nov	$1,509 jk	$41 hij	175	1.7	7.3 ef	5.0 ef	6.6 cd
2	0	0	0	1-Oct	$1,415 kl	$50 de	169	0.2	6.9 f	5.0 ef	6.6 cd
3	0	0	0	1-Nov	$1,282 l	$40 ij	170	1.0	7.1 ef	6.0 de	6.6 cd

Average	$1,721.6	$45.3	174.1	0.8	8.18	6.71	7.36
LSD 5%	144.8	1.7	n.s.	n.s.	0.51	1.03	1.06
CV %	6.6	3.0	4.1	152.2	4.9	12.1	11.3

Means followed by the same letter are not significantly different. Duncans New MRT 5%.

*** Nitrogen Rate:** Nitrogen at planting (2X2) = 8 gal 28% N, 6 gal 10-34-0 and 4 gal ThioSul for a total of 40 lbs ai/A at planting, and at the 4 lf stage 28% N was the source, applied with fluted coulter.

**** Vigor:** 0 to 10 rating, 10 is the best

Net $/A: Assume a $40 beet payment and Company average RWST.

Early Delivery Incentive, Freight costs and Fertilizer costs are all incorporated into Net $/A.

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

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Effect of Nitrogen Rates on Grower Income, Yield and Quality when Harvested Early, Mid and Late Season
Blumfield West, Richville - 2018

Nitrogen Rate Effect

No.	Nitrogen Rate* Lb ai/Acre			Net $/A	RWSA	RWST	T/A	% SUC	% CJP	% Canopy Closure
	Total	2X2	4 lf							
5	160	40	120	**$1,902 a**	**10937 a**	242 c	**44.8 a**	16.3 c	95.5	86.0 b
4	120	40	80	**$1,857 ab**	10462 b	250 b	41.5 b	16.8 b	95.4	82.0 c
3	80	40	40	**$1,830 ab**	10125 b	**254 ab**	39.4 c	**17.1 ab**	95.5	83.0 bc
6	200	40	160	$1,780 b	**10550 ab**	242 c	**43.3 ab**	16.3 c	95.5	**90.0 a**
7	240	40	200	$1,676 c	10355 b	240 c	42.6 b	16.2 c	95.3	86.0 bc
2	40	40	0	$1,594 c	8578 c	**259 a**	32.8 d	**17.3 a**	95.5	74.0 d
1	0	0	0	$1,412 d	7320 d	**257 a**	28.3 e	**17.2 a**	95.6	71.0 e

Average	$1,721.6	9760.9	249.0	38.97	16.75	95.46	81.8
LSD 5%	83.6	461.7	6.1	1.92	0.35	n.s.	4.00
CV %	6.4	6.3	3.3	6.5	2.8	0.4	5.9

Harvest Date Effect

No.	Harvest Date	Net $/A	RWSA	RWST	T/A	% SUC	% CJP	% Canopy Closure
2	Oct 1	**$1,790 a**	10264 b	251 b	41.0 b	16.8 b	95.8 b	82.0
1	Sept 1	**$1,770 a**	7224 c	218 c	33.3 c	15.2 c	94.2 c	82.0
3	Nov 1	$1,604 b	**11794 a**	**277 a**	**42.6 a**	**18.2 a**	**96.3 a**	81.0

Average	$1,721.6	9760.9	249.0	38.97	16.75	95.46	81.80
LSD 5%	54.7	273.8	3.1	1.03	0.18	0.17	n.s.
CV %	6.6	5.9	2.6	5.5	2.2	0.4	4.9

Means followed by the same letter are not significantly different. Duncans New MRT 5%.

Comments: Nitrogen was applied at 0, 40, 80, 120, 160, 200 and 240 lbs ai/A and harvested on Sept 1, Oct 1 and Nov 1. Sugarbeet yields increased significantly from 0 lbs N to 120-160 lbs N and then leveled off. The highest sugar levels were at 0, 40 and 80 lbs and the lowest sugars were with 240 lbs N. With respect to sugarbeet yields, the highest yields were on Nov 1, followed by Oct 1 and then Sept 1. Grower income did not follow yields because of the early harvest incentive program. Oct 1 had the highest dollar returns followed by Sept 1 and Nov 1.

Net $/A: Assume a $40 beet payment and trial average RWST.

Early Delivery Incentive, Freight costs and Fertilizer costs are all incorporated into Net $/A.

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

Evaluate Plant Tuff (Silicon Fertilizer) Applications in Sugarbeet Production
Blumfield West, Richville, MI - 2018

Trial Quality: Good
Variety: C-675
Planted: Apr 26
Harvested: Oct 4
Plots: 6 Rows X 38 ft, 4 reps
Row Spacing: 22 inches

Soil Info: Clay Loam
% OM: 2.9 **pH:** 7.1 **CEC:** 16.4
P: above opt **K:** above opt
Mn: high **B:** med
Added N: 130 lbs
Prev Crop: Rye

Rhizoc Level: Low
Cerc Control: Good
Problems: None
Seeding Rate: 4.5 inches
Rainfall: 24.1 inches

Application: Broadcast, Pre-plant Incorporated, Spring Application

No.	Treatment	Rate/A	Applic Timing	% Cerc Damage	Alt Rating** 1-6	Vigor Rating*** 0-10	Beets / 100 ft	RWSA	RWST	T/A	% SUC	% CJP
				4-Oct	4-Oct	7-Sep	27-Jul					
2	Plant Tuff	1 Tons	PPI	3.3	4.0	7.6	184	10611	246	43.2	16.6	95.4
1	Plant Tuff	0.5 Tons	PPI	3.4	3.8	7.6	176	10702	249	42.9	16.9	95.6
3	Untreated			3.4	4.3	7.7	179	10385	239	43.4	16.5	95.5
Average				3.40	4.00	7.70	179.8	10566.0	245.0	43.20	16.70	95.50
LSD 5%				0.30	0.40	0.40	8.9	326.1	6.9	1.20	0.40	0.30
CV %				8.2	11.3	5.9	5.2	3.2	3.0	2.8	2.3	0.4

Means followed by the same letter are not significantly different. Duncans New MRT 5%.

**** Alternaria:** 1-6 ratings, 1 is the best
***** Vigor:** 0 to 10 ratings, 10 is best
Comments: Plant Tuff is a Silicon based fertilizer that also contains other beneficial nutrients. Previous proprietary strip trials showed an increase in root yield while maintaining sugar content. Small plot replicated trials were conducted in 2018 by Michigan Sugar Company. Spring applications of Plant Tuff Silicon Fertilizer were made at both the 0.5 and 1 ton per acre rate. The 0.5 ton application rate appeared to improve Alternaria control, as well as RWST. Another trial will be completed in 2019 with the application of fertilizer being completed in the fall of 2018. Multiple harvest dates will be studied as well as roots from the trial placed into Storage Trials to determine any benefits of the treatments.

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

Pop-up Fertilizer on Sand

Wishowski Farms, Auburn - 2018

Trial Quality:	Very good	**Soil Info:**	Sand	**Rhiz Control:**	Good control: Quadris 6 leaf
Variety:	SX-1243 RR	**Fertilizer:**	See fertilizer program in the comments.	**Cerc Control:**	Fair control: See below for materials
Planted:	May 1				
Harv/Samp:	Nov 2 / Oct 23				
Plot Size:	8 reps	**Prev Crop:**	Corn		
Row Spacing:	30 inch	**Weather:**	Dry until mid July, then good weather	**Other Pests:**	N/A
Seeding Rate:	54,000				

Treatment	$/A	RWSA	RWST	T/A	% Sugar	% CJP	Population 100 Ft. of Row	
							12 Day	35 Day
In Furrow Pop-up + 2x2	$962	**5729**	**235**	**24.4**	**16.0**	**96.5**	**161**	**202**
2x2 Only	$832	4960	**233**	21.2	**15.9**	**96.4**	143	173
LSD 5%	—	298	ns	1.1	ns	ns	10	13
CV %	—	5	2	4.3	1.8	0.4	6	6

Comments: This trial was performed to evaluate the potential benefit of in-furrow pop-up fertilizer on a sand soil type. Prior to the trial the grower believed that pop-up fertilizer was really benefitting them, especially in their sand ridges and lighter soils. The grower had a field with a larger section of sandy soil with most of the trial area having a CEC that ranged from 4.5-8.5. This would likely be similar to the sand ridges that are in many fields. In addition to the light soil texture, this field also experienced a drought in the first half of the season that significantly impacted yields. It is important to note that the grower is also doing 2x2 starter fertilizer and both treatments had 2x2 starter. The pop-up treatment was in addition to the 2x2 starter. The grower used a Schaffert Rebounder Seed Firmer with a Y split at the end to deliver the pop-up fertilizer. Both tonnage and RWSA were significantly increased by using the pop-up fertilizer in this situation. In this trial, the pop-up treatment also increased stand. The fertilizer program was as follows: Fall: 150# potash & 200# pel lime. Pop-up: 2.5 gallons of water + 2 gallons of Nachurs Triple Option (4-13-17) + 1 pt of Mn + Zn + 4 oz. of Kapre Spectra Fulvic Acid. 2x2: 15 gal 28%, 4 gal 10-34-0, 2 gal K Flex. S.D.: 32 gal 28% + 1 qt of B & Am Thio. Leafspot materials: 1. Topguard EQ, 2. Super Tin, 3. Inspire XL, 4. Super Tin, 5. Bagde SC. All sprays included EBDC and Regard.

$/A: Gross payment unless noted as net. Calculated assuming a $40 payment, an average RWST of 238.

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

NDemand & Boron with Leafspot Sprays

Richmond Brothers, Pigeon - 2018

Trial Quality: Excellent
Variety: C-G675
Planted: April 28
Harv/Samp: Nov 5 / Oct 24
Plot Size: 6 reps
Row Spacing: 22"
Seeding Rate: 72,000

Soil Info: Loam
Fertilizer: See comments for the program
Prev Crop: Wheat / Radish
Weather: Dry until mid July and then good weather

Rhizoc Control: Excellent control: Quadris I.F. & 8-10 leaf
Cerc Control: Excellent Control: See comments for materials
Other Pests: N/A

Treatment	Net $/A	RWSA	RWST	T/A	% Sugar	% CJP
NDemand + Boron	$1,962	**11835**	**270**	**43.6**	**18.1**	**96.5**
Check	$1,943	**11639**	**273**	42.3	**18.2**	**96.2**
LSD 5%	—	ns (486)	ns (11)	1.0	ns (0.5)	ns (0.6)
CV %	—	3	3	1.6	2.5	0.6

Comments: This was an excellent quality trial with low coefficient of variation. Richmond Brothers believe that including foliar nitrogen and boron in their spray program has helped with plant health which is helping in both leaf spot control and sugar/yield. This trial was performed to evaluate whether those perceived benefits are actually occurring. The foliar nitrogen product was NDemand 30L (1 gallon per acre) and the boron product was FOLI-GRO Boron 10% (1 pint per acre). Both of these products are from Wilbur Ellis. The NDemand and FOLI-GRO Boron were both applied with the 1st and 3rd leafspot sprays only. The leafspot control across both treatments was excellent and no differences were able to be seen due to the low levels. NDemand and FOLI-GRO Boron did statistically improve tonnage at 95% confidence, but not RWSA. RWST was not effected with these treatments. Prior to the trial, Richmond Brothers believed that the benefits would be more to quality than to tonnage. It is possible that if a variety that was less tolerant to leafspot were used, the benefits to disease control and sugar quality may have been recognized. The total cost for adding the 2 applications of NDemand and FOLI-GRO Boron was $17.60. The leafspot program was as follows: 6/25 Proline + EBDC + NDemand + Boron, 7/17 Flint + EBDC, 8/1 Inspire XT + EBDC + NDemand + Boron, 8/16 Topguard + EBDC, 9/6 Proline + EBDC, 10/1 EBDC. All applications include Reguard sticker and Crosshair drift and deposition aid. The fertilizer program was: PP: 20 gal 28%; 2x2: 7 gal 28%, 10 gal 10-34-0, 4 gal Thiosul, + 2 qt Mn, 1.5 qt B; Streamer at 6-8 leaf: 13 gal 28% + 7 gal H2O.

Net **$/A:** Gross payment with the Ndemand & B cost deducted. Calculated assuming a $40 payment and a company average RWST of 238.
Bold: Results are not statistically different from top ranking treatment in each column.

MICHIGAN STATE UNIVERSITY EXTENSION

Michigan State University AgBioResearch

Evaluating Sugarbeet Nitrogen Application Strategies

Kurt Steinke and Andrew Chomas, Michigan State University

See soil.msu.edu for more information

Location: Saginaw Valley Research and Extension Center	**Tillage**: Conv., 30-in. row
Planting Date: April 30, 2018 (Harvest 10/18/18)	**Trt's**: See below
Soil Type: Clay loam; 2.1% OM; 8.0 pH; 34 ppm P; 185 ppm K	**Population**: 4 in. spacing
Variety: B1399	**Replicated**: 4 replications

N Strategy[a]	RWSA	RWST	Tons/A	% Sugar
0 – Check	6750	247	27	16.7
Coulter SD 2-4 lf	7741	243	32	16.4
Y-Drop SD 2-4 lf	8039	236	34	16.1
Pre-Plant Inc.	8017	239	33	16.2
Surface Band SD 2-4 lf w/ UI[b]	8936	245	35	16.6
Rain Drop SD 2-4lf	8199	241	34	16.3
Streamer SD 2-4 lf	7318	247	30	16.6
LSD$_{(0.10)}$[c]	**886**	**NS**	**3.2**	**NS**

[a] ALL TREATMENTS OTHER THAN CHECK RECEIVED 40 N 2X2 AT-PLANT.

[b] UI, Urease inhibitor

[c] LSD, least significant difference between means within a column at ($\alpha = 0.10$).

Summary: Trial quality was good to very good. Please note all treatments other than the check received 2x2 N at-plant (40 lb./A). Sidedress N applications were completed at the 2-4 leaf stage on May 31 for a total N application rate of 160 lb./A. Lack of soil moisture and precipitation may limit sugarbeet response to N timing and sidedress placement strategies. Dry June and July soil conditions likely limited N movement and wet August soils inhibited sugar accumulation resulting in few differences between N application methods. The use of a urease inhibitor with surface banded N did not appear to affect root yield compared to other surface applied N indicating that although soils were dry volatile N loss conditions may not have been present.

MICHIGAN STATE UNIVERSITY EXTENSION

Michigan State University AgBioResearch

Sugarbeet Nitrogen Response Following Corn

Kurt Steinke and Andrew Chomas, Michigan State University

See soil.msu.edu for more information

Location: Saginaw Valley Research and Extension Center	**Tillage**: Conv., 30-in. row
Planting Date: April 30, 2018 (Harvest 10/18/18)	**N Rates**: See below
Soil Type: Clay loam; 2.1% OM; 8.0 pH; 34 ppm P; 185 ppm K	**Population**: 4 in. spacing
Variety: Crystal 675	**Replicated**: 4 replications

N Trt. (Total lb. N/A)	RWSA	RWST	Tons/A	% Sugar
0 – Check	6224	261	24	17.6
40	8632	272	32	18.1
80	8347	267	31	17.9
120	8731	275	32	18.3
160	9316	268	35	18.0
200	8733	266	33	17.7
240	8790	254	35	17.2
$LSD_{(0.10)}$[a]	**1338**	**9**	**4.4**	**0.4**

[a] LSD, least significant difference between means within a column at ($\alpha = 0.10$).

N Trt. (Total lb. N/A)	Gross Grower Payment ($/A)	Net Economic Return Minus N Costs ($/A)[a]	Net Economic Return Minus N Costs and Trucking ($/A)[b]
0 – Check	1076	1076	986
40	1495	1477	1357
80	1421	1386	1270
120	1511	1458	1338
160	1611	1541	1410
200	1507	1419	1285
240	1527	1421	1290

[a, b] Gross grower payment and net economic returns based upon a $41/ton base payment with volume and quality incentives, an N price of $0.44/lb., and trucking costs of $3.75/T.

Summary: Trial quality was good. All treatments received 40 lbs. N/A as 28%, 20 lbs. P_2O_5/A, 50 lbs. K_2O/A. and 2 lbs. Mn/A as starter placed 2x2 on April 30. Sidedress N applications were completed at the 2-4 leaf stage on May 30. Although nitrogen rates above 40 lb N/A resulted in few differences in tonnage and quality, profitability was maximized at 160 lb N/A. Gross payment and net returns were maximized at 160 lb N/A (40 N 2x2 and 120 N sidedress).

MICHIGAN STATE UNIVERSITY EXTENSION

Michigan State University AgBioResearch

Does Sugarbeet Row Spacing Affect the Need for Starter Nitrogen?

Kurt Steinke[1], Brian Groulx[2], Seth Purucker[1], and Andrew Chomas[1]
[1] Michigan State University and [2] Michigan Sugar Company
See soil.msu.edu for more information

Location: Saginaw Valley Research and Extension Center	**Tillage**: Conv.
Planting Date: April 30, 2018 (Harvest 09/27/18)	**Trts:** See below
Soil Type: Clay Loam; 2.1 OM; 8.0 pH; 34 ppm P; 185 ppm K	**Population**: 4 in. spacing
Variety: Crystal 675	**Replicated**: 4 replications

Row spacing	RWSA	RWST	Tons/A	% Sugar	% CJP
22 inch	5725	232	26	16.1	95.2
30 inch	6697	245	27	16.8	95.9
$LSD_{(0.10)}$[a]	**NS**	**9**	**NS**	**0.5**	**0.23**

[a] LSD, least significant difference between means within a column at ($\alpha = 0.10$).

Summary: Study was undertaken to help determine whether row spacing impacted the need for starter N applied 2x2 at planting. Four treatments were evaluated in a split-plot design and included: 1) 22 inch rows with 40 lbs. N/A 2x2 and 120 N sidedressed (2-4 lf), 2) 22 inch rows with 40 lbs. N/A applied PRE and 120 N sidedressed (2-4 lf), 3) 30 inch rows with 40 lbs. N/A 2x2 and 120 N sidedressed (2-4 lf), and 4) 30 inch rows with 40 lbs. N/A applied PRE and 120 N sidedressed (2-4 lf). Treatments with 2x2 received 40 lbs. N/A using UAN 28% two inches below and two inches to the side of the seed at planting. Treatments with N applied PRE received 40 lbs. N/A using urea with a urease inhibitor broadcast applied immediately following planting. Sidedress N applications were completed at the 2-4 leaf stage on May 30 for a total N application rate of 160 lb./A.

Due to no interaction between row spacing and starter N, only main effects of row spacing on sugar yield and quality are displayed as starter N did not impact these parameters. No differences in tonnage or RWSA were observed due to row spacing. However, percent sugar, purity, and RWST were significantly greater with 30 inch as compared to 22 inch rows. June through July precipitation was 36% below 30-year means indicating dry soil conditions likely limited N movement and plant growth following both 2x2 and sidedress N applications. Starter N applied 2x2 did achieve row closure 10-14 days sooner compared to no starter N applications. Row closure was achieved 7-10 days earlier in 22 inch rows as compared to 30 inch rows but did not translate into greater sugar production. Starter N can offer stand consistency across variable spring and summer weather conditions but did not result in a measureable yield response in 2018. Trial will be repeated in 2019.

MICHIGAN STATE UNIVERSITY EXTENSION

Michigan State University AgBioResearch

Sugarbeet Response to Starter Fertilizer, N Rate, and Plant Population

Seth Purucker, Andrew Chomas, and Kurt Steinke, Michigan State University
See soil.msu.edu for more information

Location: Saginaw Valley Research and Extension Center	**Tillage**: Conv., 30-in. row
Planting Date: April 30, 2018 (Harvest 10/18/18)	**Trts:** See below
Soil Type: Clay Loam; 2.1% OM; 8.0 pH; 34 ppm P; 185 ppm K	**Population**: 3 ½ & 4 in. spacing
Variety: Crystal 675	**Replicated**: 4 replications

N Rate and 2x2 Interaction	Tons/A	RWSA	Gross Grower Payment ($/A)	Net Economic Return Minus N Costs ($/A)[a]	Net Economic Return Minus N Costs and Trucking ($/A)[b]
0 N w/ 2x2	23c[†]	6046d	1041d[†]	1041c	955c
0 N w/o 2x2	24c	6310d	1074d	1074c	986c
80 N w/ 2x2	31b	8255b	1416bc	1381ab	1266ab
80 N w/o 2x2	28b	7530c	1292c	1257b	1150b
160 N w/ 2x2	36a	9253a	1590a	1520a	1386a
160 N w/o 2x2	30b	7754bc	1330bc	1260b	1147b
240 N w/ 2x2	34a	8385b	1438b	1333b	1206b
240 N w/o 2x2	34a	8252b	1421b	1316b	1187b
P>F	**<0.01**	**<0.01**	**<0.01**	**<0.01**	**<0.01**

[†]Column values with the same lower case letter are not significantly different at α=0.10.

[a, b] Gross grower payment and net economic returns based upon $41/ton base payment with volume and quality incentives, an N price of $0.44/lb., and trucking costs of $3.75/T.

Summary: Trial quality was good to very good. Treatments consisted of two populations (3½ and 4 inch spacing which resulted in 50,000 or 60,000 seeds per acre), four N rates (0, 80, 160, 240 lbs. N/A), and 2x2 applied starter fertilizer (with and without). All treatments with starter fertilizer received 40 lbs. N/A as 28%, 20 lbs. P_2O_5/A, 50 lbs. K_2O/A, and 2 lbs. Mn/A applied 2 inches below and two inches to the side of the seed. Treatments at the 0 lbs. N/A rate did not receive any N in starter application only P, K, and Mn. Starter N was subtracted from sidedress N application rates. Sidedress N applications were completed at the 2-4 leaf stage on May 30 using 28% UAN.

An interaction between N rate and starter fertilizer significantly affected yield, RWSA, gross grower payment, and net economic returns. A total N rate of 160 lb. N/A (40 N 2x2 with 120 N sidedress) resulted in the best combination of tonnage, quality, and profitability. When starter N was not utilized, an additional 80 lb N/A were required to achieve maximum yield. Plant

population resulted in few difference in sugar quality. Overall N rate significantly affected RWST and % sugar with no improvements over 80 lb. N/A. Wet soil conditions from increased August and September rainfall likely decreased overall sugar contents.

Treatment	RWST	% Sugar	% CJP
Population, seeds A^{-1}			
50,000	258 a†	17.2 a	96.3 a
60,000	260 a	17.4 a	96.3 a
P>F	**NS**	**NS**	**NS**
N Rate, lbs. N A^{-1}			
0	266 a	17.7 ab	96.3 a
80	267 a	17.8 a	96.4 a
160	259 b	17.3 b	96.3 a
240	245 c	16.5 c	96.1 a
P>F	**<0.01**	**<0.01**	**NS**
Starter Fertilizer			
2x2	260 a	17.3 a	96.3 a
No 2x2	258 a	17.2 a	96.4 a
P>F	**NS**	**NS**	**NS**

†Column values with the same lower case letter are not significantly different at α=0.10.

Gross grower payment was maximized at 160 lbs. N/A with 2x2 application. However net economic return was maximized at 80 lbs. N/A with 2x2 application. Growers often perceive yield loss as a greater risk than profitability. However, greater tonnage and payment may not offset input costs and greater input intensities may impact disease development. Starter (2x2) applied N may provide opportunities to increase N efficiency, decrease overall N rates, and help address mid-season variable weather patterns. Trial will be repeated in 2019.

Sugarbeet tolerance to a potential new herbicide, tiafenacil

Christy Sprague, Gary Powell and Brian Stiles, Michigan State University

Location: Richville (SVREC)	**Application timings**: 7 & 3 DBP, and PRE
Planting Date: April 30, 2018	**Herbicides:** see treatments
Soil Type: Clay loam	**O.M.:** 2.3 **pH:** 8.0
Replicated: 4 times	**Variety:** ACH G515RR

Table 1. Sugarbeet injury, harvest stand, yield, and recoverable white sugar per acre (RWSA) for preplant and preemergence applications of various rates of tiafenacil[a].

Herbicide treatments[a]	Rate	Timing	Injury (30 DAP)	Harvest Stand	Yield	RWSA
			—%—	— #/100' row —	— ton/A —	— lb/A —
No herbicide			0	204	27.2	6036
Tiafenacil	3 fl oz	7 DBP	22*[b]	184	26.0	5562
Tiafenacil	6 fl oz	7 DBP	64*	110*	21.1*	4585*
Tiafenacil	9 fl oz	7 DBP	77*	96*	16.2*	3232*
Gramoxone	4 pt	7 DBP	0	185	25.4	5360
Tiafenacil	3 fl oz	3 DBP	26*	163	26.5	5716
Tiafenacil	6 fl oz	3 DBP	66*	113*	18.9*	3897*
Tiafenacil	9 fl oz	3 DBP	84*	89*	14.6*	3039*
Gramoxone	4 pt	3 DBP	0	202	25.1	5508
Tiafenacil	3 fl oz	PRE	16	213	28.5	6368
Tiafenacil	6 fl oz	PRE	55*	155*	23.4	5023
Tiafenacil	9 fl oz	PRE	79*	113*	18.9*	4474*
Gramoxone	4 pt	PRE	0	176	25.4	5528
$LSD_{0.05}$[c]			*17*	*44*	*5.2*	*1142*

[a] The study area was treated with Roundup PowerMax at 32 fl oz/A + ammonium sulfate at 17 lb/100 gal to keep the area weed-free.

[b] Injury, stand, yield and RWSA data with asterisks (*) are significantly different from the no herbicide control.

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

Summary: Tiafenacil is a new herbicide active ingredient being examined as a potential preplant burndown herbicide. This herbicide is a Group 14 (PPO-inhibitor) herbicide. A field trial was conducted to determine the tolerance of sugarbeet to this herbicide applied preplant and preemergence. Gramoxone was also applied at the preplant and preemergence timings to serve as a no-residual herbicide control. All rates of tiafenacil caused sugarbeet injury at the three different application timings, 30 DAP. Injury increased with increasing rates of tiafenacil. Injury mostly consisted of sugarbeet stand loss and stunting. At harvest tiafenacil at the two higher rates (6 and 9 fl oz/A) resulted in significantly lower sugarbeet stand. Yield and recoverable white sugar per acre (RWSA) were also reduced, with the exception of the 6 fl oz/A rate of tiafenacil applied preemergence. The 3 fl oz/A rate of tiafenacil at any of the timings did not significantly reduce sugarbeet stand, yield or RWSA. Currently, it appears that the crop safety of this herbicide may not be adequate for use in sugarbeet. However, this herbicide should be examined further to determine what the weed control spectrum of this herbicide is at 3 fl oz/A rate and lower.

Sugarbeet tolerance to postemergence applications of Ultra Blazer tank-mixtures with glyphosate

Christy Sprague, Gary Powell and Brian Stiles, Michigan State University

Location: Richville (SVREC)	**Application timings**: 2-lf beets (May 23), 4-6 lf beets (June 5), 12-lf beets (June 19)
Planting Date: April 23, 2018	**Herbicides:** see treatments
Soil Type: Clay loam	**O.M.:** 2.3 **pH:** 8.0
Replicated: 4 times	**Variety:** ACH G515RR

Table 1. Sugarbeet tolerance to POST applications of Ultra Blazer (aciflurofen) applied at various sugarbeet stages.

Herbicide treatments[a]	Timing	Injury (June 19)	Injury (June 26)	Injury (July 10)	Yield	RWSA
		— % —	— % —	— % —	– ton/A –	– lb/A –
Roundup PowerMax (22/22/22 fl oz)		0	0	0	25.0	5612
Ultra Blazer (8/8/8 fl oz)	2, 4-6, 12 lf	29*[b]	25*	20*	20.5*	4641
Ultra Blazer (16/16/16 fl oz)	2, 4-6, 12 lf	28*	28*	24*	20.1*	4424*
Ultra Blazer (16 fl oz)	2-lf	3	0	0	24.9	5538
Ultra Blazer (24 fl oz)	2-lf	4*	1	0	22.9	5046
Ultra Blazer (24 fl oz)	4-6-lf	25*	9*	2	24.9	5159
Ultra Blazer (24 fl oz)	12-lf	0	20*	21*	21.6	4664
Ethotron (12 fl oz) + Ultra Blazer (24 fl oz)	2-lf	5*	2	0	23.2	5015
Ethotron (12 fl oz) + Ultra Blazer (24 fl oz)	4-6 lf	28*	13*	0	24.0	5270
Ethotron (12 fl oz) + Ultra Blazer (24 fl oz)	12 lf	0	24*	23*	21.6	4440*
Ethotron (12/12/12 fl oz)	2, 4-6, 12 lf	0	4	7	23.3	5259
$LSD_{0.05}$[c]		*3.7*	*5.9*	*3.6*	*4.4*	*1016*

[a] Roundup PowerMax 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] Sugarbeet injury, yield and RWSA data with asterisks (*) are significantly different from the Roundup alone control.

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

Summary: Options are extremely limited for POST control of glyphosate-resistant pigweed (waterhemp and Palmer) in sugarbeet. Ultra Blazer (aciflurofen) is an older Group 14 herbicide that has activity on pigweed species. A field trial was conducted to evaluate sugarbeet safety to POST applications of Ultra Blazer. All applications of Ultra Blazer resulted in sugarbeet injury. Injury symptoms from Ultra Blazer consist of leaf speckling/bronzing of the sugarbeet leaves. However, over time sugarbeet was able to grow out of some of this injury. Multiple applications of Ultra Blazer caused sugarbeet injury to persist and ultimately reduce yield by 5 tons/A. However, if a single application of Ultra Blazer was made at any of the application timings, sugarbeet yield was not affected. There are still several things that need to be examined before an Ultra Blazer label for sugarbeet is pursued. Questions that need to be answered include: 1) What level of sugarbeet injury are growers comfortable with?, 2) Will sugarbeet be able to outgrow this injury under different environments?, and 3) How effective will this herbicide be in controlling either glyphosate-resistant waterhemp or Palmer amaranth in sugarbeet.

MICHIGAN STATE UNIVERSITY EXTENSION

Michigan State University AgBioResearch

Rotational crop safety with postemergence applications of ethofumesate

Christy Sprague, Gary Powell and Brian Stiles, Michigan State University

Location: Richville (SVREC)	**Sugarbeet planting date:** April 18, 2017
Corn planting date: May 1, 2018	**Soil Type:** Clay loam
Soybean planting date: May 16, 2018	**O.M.:** 2.6 **pH:** 6.9
Dry bean planting date: June 19, 2018	**Replicated:** 4 times

Table 1. Tolerance of corn, soybean, and black beans the year following postemergence applications of high rates of ethofumesate[a].

		30 d after planting		
Herbicide treatments[b]	**Timing**	**Injury**	**Stand**	**Yield**
Corn 'Stine 9316'		— % —	- #/30' row -	— bu/A —
No herbicide		0	56	205
Ethofumesate (32/32/32/32 fl oz)	2-lf, + 2 WAT – 4 times	0	55	198
Ethofumesate (128 fl oz)	June 15	0	57	212
Ethofumesate (128 fl oz)	July 15	0	57	212
Ethofumesate (128 fl oz)	August 15	0	56	215
Soybean 'Stine 14RD62'				— bu/A —
No herbicide		0	178	76.6
Ethofumesate (32/32/32/32 fl oz)	2-lf, + 2 WAT – 4 times	0	161	76.1
Ethofumesate (128 fl oz)	June 15	0	178	78.7
Ethofumesate (128 fl oz)	July 15	0	171	74.5
Ethofumesate (128 fl oz)	August 15	0	175	76.4
Black bean 'Zenith'				— cwt/A —
No herbicide		0	157	31.3
Ethofumesate (32/32/32/32 fl oz)	2-lf, + 2 WAT – 4 times	0	158	30.8
Ethofumesate (128 fl oz)	June 15	0	153	30.9
Ethofumesate (128 fl oz)	July 15	0	150	30.8
Ethofumesate (128 fl oz)	August 15	0	153	31.7

[a] Plots were kept weed-free with the Roundup PowerMax in corn and soybean and with Dual Magnum + Prowl H2O in dry bean.

[b] Herbicide treatments were applied postemergence to sugarbeet in 2017.

Summary: Ethofumesate is a Group 18, selective herbicide used for weed control in sugarbeet. Historically, ethofumesate was primarily used preemergence as part of an overall program for residual weed control of key Michigan weeds. However, it can be used POST and over the past couple of years we have observed some positive results with split-POST ethofumesate at rates as high as 2 pt/A for glyphosate-resistant waterhemp control. The recent label change increased the POST ethofumesate rates from 12 to 128 fl oz/A. However, one of the issues with using some of these higher rates of ethofumesate POST is the current crop rotation restrictions. The current ethofumesate label states: do not rotate to any crops other than sugarbeets or ryegrass for 12 months following applications totaling more than 12 fl oz/A or 6 months following postemergence applications of 12 fl oz/A or less. In 2017 we established a plant back study to examine the crop safety of corn, soybean and dry bean the year following high application rates of ethofumesate. This year's results were extremely positive, in that there did not appear to be any ethofumesate carryover issues with any of the three crops. We established another trial in 2018 to get two years data and hopefully provide supporting data for a label change.

MICHIGAN STATE UNIVERSITY EXTENSION

Michigan State University AgBioResearch

Sugarbeet tolerance to overlapping residual herbicide programs

Christy Sprague, Gary Powell and Brian Stiles, Michigan State University

Location: Richville (SVREC)	**Application timings**: PRE (April 23), 2-lf beets (May 23), 6-8 lf beets (June 19)
Planting Date: April 23, 2018	**Herbicides:** see treatments
Soil Type: Clay loam	**O.M.:** 2.3 **pH:** 8.0
Replicated: 4 times	**Variety:** ACH G515RR

Table 1. Comparison of sugarbeet tolerance of two-passes of overlapping residual herbicide programs applied POST alone and with ethofumesate (PRE) or a low rate of Dual II Magnum (PRE).

Herbicide treatments[a]		Injury (7 DA-4-lf)	Harvest Stand	Yield	RWSA
PREs	***POST at 2- and 6-lf beets***	—%—	- #/100' row -	- ton/A -	— lb/A —
None	Roundup PowerMax (32/22 fl oz)	1	200	27.2	5799
None	Dual II Magnum (1/1 pt)	9	189	24.5	5392
None	Warrant (3/3 pt)	2	207	23.7	5143
None	Outlook (12/12 fl oz)	6	188	23.3	5039
Ethofumesate (2 pt)	Dual II Magnum (1/1 pt)	3	206	24.9	5562
Etho. (2 pt)	Warrant (3/3 pt)	11	180	21.9*	4811
Etho. (2 pt)	Outlook (12/12 fl oz)	18*[b]	180	23.9	5010
Etho. (2 pt)	Ethofumesate[a] (2/2 pt)	17*	197	25.5	5466
Dual II Magnum (0.5 pt)	Dual II Magnum (1/1 pt)	6	213	26.5	5768
Dual II Magnum (0.5 pt)	Warrant (3/3 pt)	11	192	21.5*	4583*
Dual II Magnum (0.5 pt)	Outlook (12/12 fl oz)	15*	206	26.2	5725
Dual II Magnum (0.5 pt)	Ethofumesate[a] (2/2 pt)	6	193	25.3	5429
$LSD_{0.05}$[c]		*12*	*- NS -*	*4.62*	*1150*

[a] Roundup PowerMax was included in all postemergence treatments at the rates listed in the first treatment. These treatments also included AMS at 17 lb/100 gal. All POST applications of ethofumesate was applied with 1.5 pt/A of Destiny HC.
[b] Injury, stand, yield and RWSA data with asterisks (*) are significantly different from the Roundup PowerMax alone control.
[c] Means within a column greater than least significant difference (LSD) value are different from each other.

Summary: Overlapping residual herbicide programs may be the only way to effectively control glyphosate-resistant pigweed (waterhemp and Palmer) in sugarbeet. A field trial was conducted at the Saginaw Valley Research and Extension Center to determine what effect multiple applications of residual herbicides have on sugarbeet injury, stand, yield and recoverable white sugar per acre (RWSA). The Group 15 herbicides, Dual II Magnum, Outlook and Warrant were all evaluated at maximum rates allowed per season. These treatments were also evaluated after a preemergence application of ethofumesate or Dual II Magnum at a low rate (currently not labeled). Postemergence ethofumesate was also evaluated. Sugarbeet injury was greatest when Outlook followed the PREs of ethofumesate or Dual II Magnum. Three applications of ethofumesate also caused significant injury. None of these treatments resulted in a loss or yield or RWSA. The only treatments that caused reductions in yield consisted of two POST applications of Warrant following ethofumesate and Dual II Magnum (PRE). These treatments were also examined for waterhemp control and these studies should be repeated over more environments.

MICHIGAN STATE UNIVERSITY EXTENSION

Michigan State University AgBioResearch

Waterhemp control with overlapping residual herbicide programs

Christy Sprague, Gary Powell and Brian Stiles, Michigan State University

Location: Isabella Country	**Application timings**: PRE (May 1), 2-lf beets (May 30), 6-8 lf beets (June 21)
Planting Date: May 1, 2018	**Herbicides:** see treatments
Soil Type: Sandy loam	**O.M.:** 2.9 **pH:** 7.2
Replicated: 4 times	**Variety:** ACH G515RR

Table 1. Comparison of sugarbeet tolerance of two-passes of POST overlapping residual herbicide programs alone and with ethofumesate (PRE) or low rates of Dual II Magnum (PRE).

		Waterhemp control		
Herbicide treatments[a]		**June 21**	**July 23**	**August 9**
PREs	***POST applications at 2- and 6-lf beets***	—%—	—%—	—%—
None	Roundup PowerMax (32/22 fl oz)	0	23	17
None	Dual II Magnum (1/1 pt)	40	50	23
None	Warrant (3/3 pt)	67	61	53
None	Outlook (12/12 fl oz)	73	76	74
Ethofumesate (2 pt)	Dual II Magnum (1/1 pt)	81*	78	73
Etho. (2 pt)	Warrant (3/3 pt)	71	83*	76
Etho. (2 pt)	Outlook (12/12 fl oz)	93*	90*	83*
Etho. (2 pt)	Ethofumesate[a] (1/1 pt)	75	88*	86*
Dual II Magnum (0.5 pt)	Dual II Magnum (1/1 pt)	91*	94*	90*
Dual II Magnum (0.5 pt)	Warrant (3/3 pt)	86*	87*	82*
Dual II Magnum (0.5 pt)	Outlook (12/12 fl oz)	98*	97*	94*
Dual II Magnum (0.5 pt)	Ethofumesate[a] (1/1 pt)	93*	95*	91*
$LSD_{0.05}$[c]		*19*	*15*	*15*

[a] Roundup PowerMax was included in all postemergence treatments at the rates listed in the first treatment. These treatments also included AMS at 17 lb/100 gal. All POST applications of ethofumesate was 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: Overlapping residual herbicide programs may be the only way to effectively control glyphosate-resistant pigweed (waterhemp and Palmer) in sugarbeet in the future. A field trial was conducted at a location in Isabella County with a high natural population of glyphosate- and ALS-resistant waterhemp. Several Group 15 herbicides, Dual II Magnum, Outlook and Warrant were evaluated at maximum rates allowed per season. These treatments were also evaluated after a preemergence application of ethofumesate or Dual II Magnum at a low rate (currently not labeled). Effective waterhemp control was variable (ranging from 82-94%), but was greatest through the beginning of August when PRE Ethofumesate was followed by two POST applications of Outlook or Ethofumesate. Additionally, Dual II Magnum at 0.5 pt PRE followed by two POST applications of Dual II Magnum, Warrant, Outlook or Ethofumesate were also effective. We will be continuing to examine and refine waterhemp control strategies in sugarbeet in the future.

Effect of Harvest Date on Sugarbeet Yield, Quality and Grower Income

Average of 9 years, 24 Locations

Harvest: 6 Dates, Aug 15 to Nov 1
Plot Size: 6 rows X 38 ft, various reps
Seeding Rate: 4.5 inches
Beet Population: About 200 B/100'

No.	Harvest Date	Net $/A	$/Ton	RWSA	RWST	T/A	% SUC	% CJP	Beets/ 100'
2	September 1	$1,937	$67 b	6449 e	216 e	29.7 d	15.1 d	94.2 d	201.7
3	September 15	$1,908	$61 c	7655 d	236 d	32.8 c	16.1 c	94.9 c	197.3
4	October 1	$1,867	$56 d	8829 c	257 c	34.9 b	17.4 b	95.0 c	195.5
5	October 15	$1,814	$50 e	10195 b	268 b	**38.4 a**	**18.0 ab**	95.5 b	200.5
6	November 1	$1,794	$49 e	**11021 a**	**280 a**	**39.7 a**	**18.6 ab**	**95.8 a**	196.4
1	August 15	$1,789	**$78 a**	4756 f	208 e	22.7 e	14.6 d	93.7 e	202.2
Average		$1,851.5	$60.1	8150.8	244.1	33.01	16.65	94.87	198.94
LSD 5%		n.s.	3.6	382.6	10.5	1.58	0.63	0.32	n.s.
CV %		12.5	10.6	8.2	7.5	8.4	6.6	0.6	6.2

Means followed by the same letter are not significantly different. Duncans New MRT 5%.

Comments: After 9 years of testing, the data shows numerical differences in net $/acre, but no statistical difference. Yield and sugar content gradually increase over the various harvest dates until the October 15 harvest where both yield and sugar increases tend to stabilize. Trials will continue to provide data to make adjustments to early delivery incentives.

Net $/A: Gross payment unless noted as net. Calculated assuming a $40 payment and a trial average RWST.

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

Average of 4 Locations - 2018

Trial Quality: Good
Variety: C-675
Planted: Blum W - April 26, Sylvester - April 27
Shaffner - May 1, Gerstenberger - May 1
Harvested: See trts.
Plots: 6 rows X 38ft, 4 and 5 reps
Rhizoc Level: Low
Cerc Control: Very Good
Seeding Rate: 4.5 inches
Row Spacing: 22 inches

No.	Harvest Date	Net $/A	$/Ton	RWSA	RWST	T/A	% SUC	% CJP	Beets/ 100'
6	Nov 1	$2,005	$43 b	**12030 ab**	**261 a**	**45.7 a**	**17.5 a**	96.0 b	269.4
2	Sept 1	$1,970	**$53 ab**	7618 e	209 d	35.8 c	14.7 d	94.5 d	273.9
7	Nov 15	$1,901	$43 b	**12313 a**	**269 a**	**45.6 a**	**17.9 a**	**96.2 ab**	258.6
5	Oct 15	$1,846	$42 b	11351 b	**254 ab**	**44.1 a**	**17.0 ab**	**96.4 a**	267.6
3	Sept 15	$1,842	$49 b	8489 d	231 c	36.3 c	15.9 c	94.6 d	272.3
4	Oct 1	$1,829	$45 b	9735 c	241 bc	40.2 b	16.5 bc	95.3 c	265.8
1	Aug 15	$1,770	**$65 a**	5138 f	201 d	24.1 d	14.2 d	93.7 e	269.1
Average		$1,880.4	$48.5	9524.8	237.9	38.82	16.25	95.23	268.11
LSD 5%		n.s.	13.4	788.7	16.2	2.46	0.94	0.30	n.s.
CV %		18.3	18.5	5.6	4.6	4.2	3.9	0.2	5.0

Means followed by the same letter are not significantly different. Duncans New MRT 5%.

Comments: Trials in 2018 experienced very dry conditions in July and August, followed by ample rainfall in September. Yield and sugar content increased significantly until the October 15 harvest date.

Net $/A: Gross payment unless noted as net. Calculated assuming a $40 payment and a trial average RWST.

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

Effect of Havest Date on Sugarbeet Yield, Quality and Grower Income

Blumfield West, Richville, MI - 2018

Trial Quality: Very Good
Variety: C-675
Planted: April 26
Harvested: See trts.
Plots: 6 rows X 38 ft, 5 reps
Row Spacing: 22 inch

Soil Info: Clay Loam
% OM: 2.9 **pH:** 7.1 **CEC:** 16.4
P: above opt **K:** above opt
Mn: high **B:** med
Added N: 135 lbs
Prev Crop: Rye

Rhizoc Level: Low
Cerc Control: Very Good
Problems: None

Seeding Rate: 4.5 inches

No.	Harvest Date	Net $/A	$/T	RWSA	RWST	T/A	% SUC	% CJP	Beets /100ft	GDD*	Rain Inch**
2	Sept 1	**$2,233 a**	$59 b	8288 c	217 e	38.1 b	15.2 d	94.2 cd	265.0	35	19.4
3	Sept 15	$1,958 b	$53 c	8804 bc	238 d	37.0 b	16.4 c	94.6 c	274.4	33	20.2
5	Oct 15	$1,900 b	$43 e	**11872 a**	270 b	**44.0 a**	17.7 b	**96.6 a**	245.4	23	22.9
6	Nov 1	$1,860 b	$40 f	**12626 a**	**274 ab**	**46.1 a**	**18.2 ab**	**96.0 ab**	269.8	9	24.0
7	Nov 8	$1,859 b	$42 ef	**12573 a**	**285 a**	**44.1 a**	**18.7 a**	**96.4 a**	240.5	N/A	24.6
4	Oct 1	$1,803 b	$47 d	9529 b	250 c	38.3 b	16.8 c	95.4 b	236.0	24	22.9
1	Aug 15	$1,584 c	**$70 a**	4440 d	195 f	22.8 c	13.8 e	93.9 d	262.8	38	12.7
Average		$1,885.3	$50.6	9733.2	247.1	38.62	16.68	95.28	256.26	27.0	21.0
LSD 5%		177.4	2.7	903.3	11.3	3.24	0.65	0.58	n.s.		
CV %		7.2	4.1	7.1	3.5	6.4	3.0	0.5	9.0		

***GDD** (Growing Degree Days): an average daily amount for the 2 weeks prior to that harvest date.
****Rain Inch:** Actual rainfall amount including 2 weeks prior to the planting date.
Comments: Very dry July and August conditions, followed by rain in September contributed to significant increases in yield and sugar content through late October.
Net $/A: Gross payment unless noted as net. Calculated assuming a $40 payment and a trial average RWST.
Bold: Results are not statistically different from top-ranking treatment in each column.

Shaffner Brothers, Freeland, MI - 2018

Trial Quality: Good
Variety: C-675
Planted: May 8
Harvested: See trts.
Plots: 6 rows X 38 ft, 5 reps
Row Spacing: 22 inch

Soil Info: Loam
% OM: 2.5 **pH:** 7.5 **CEC:** 16.9
P: above opt **K:** above opt
Mn: high **B:** med
Added N: 135 lbs
Prev Crop: Corn

Rhizoc Level: Low
Cerc Control: Good
Problems: None

Seeding Rate: 4.5 inches

No.	Harvest Date	Net $/A	$/T	RWSA	RWST	T/A	% SUC	% CJP	Beets /100ft	GDD*	Rain Inch**
1	Aug 15	$3,338	**$85 a**	9662 d	246 b	39.2 c	16.9 b	94.1 c	320.7	38	7.6
6	Nov 1	$2,936	$50 bcd	**15630 a**	**268 a**	**58.1 a**	**18.0 a**	**96.1 a**	293.7	8	16.3
2	Sept 1	$2,699	$61 b	10285 d	231 c	44.5 c	16.0 c	95.1 b	288.6	34	12.2
3	Sept 15	$2,507	$54 bc	11583 cd	248 b	46.4 bc	16.9 b	94.8 b	295.2	32	12.7
4	Oct 1	$2,379	$45 cd	12969 bc	246 b	**52.9 ab**	16.8 b	95.3 b	317.8	23	14.3
5	Oct 15	$2,301	$41 cd	**14820 ab**	**263 a**	**56.1 a**	**17.6 a**	**96.6 a**	304.8	22	15.3
7	Nov 8	$2,236	$39 d	**15618 a**	**273 a**	**57.0 a**	**18.1 a**	**96.4 a**	304.4	N/A	17.1
Average		$2,628.0	$53.5	12938.3	253.5	50.60	17.18	95.48	303.60	26.2	13.6
LSD 5%		n.s.	12.9	2013.3	11.9	6.92	0.64	0.70	n.s.		
CV %		29.9	20.5	13.2	4.0	11.6	3.2	0.6	9.3		

***GDD** (Growing Degree Days): an average daily amount for the 2 weeks prior to that harvest date.
****Rain Inch:** Actual rainfall amount including 2 weeks prior to the planting date.
Comments: This trial was not as dry as others early in the season. Yields increased through early October, and sugar content increased through mid October. High stands and adequate rains promoted very high yields at all harvest dates.
Net $/A: Gross payment unless noted as net. Calculated assuming a $40 payment and a trial average RWST.
Bold: Results are not statistically different from top-ranking treatment in each column.

Effect of Harvest Date on Sugarbeet Yield, Quality and Grower Income

Sylvester, Quanicassee, MI - 2018

Trial Quality: Very Good
Variety: C-675
Planted: April 27
Harvested: See trts.
Plots: 6 rows X 38 ft, 5 reps
Row Spacing: 22 inches

Soil Info: Clay Loam
% OM: 3.4 **pH:** 7.3 **CEC:** 21.1
P: above opt **K:** above opt
Mn: high **B:** med
Added N: 185 lbs
Prev Crop: Corn

Rhizoc Level: Low
Cerc Control: Very Good
Problems: None
Seeding Rate: 4.5 inches

No.	Harvest Date	Net $/A	$/Ton	RWSA	RWST	T/A	% SUC	% CJP	Beets/ 100ft	GDD*	Rain Inch**
2	Sept 1	**$2,228 a**	$60 b	7748 d	209 c	37.0 c	14.7 c	94.3 d	301.6	36	21.3
4	Oct 1	**$2,081 ab**	$49 c	10299 b	243 a	42.3 b	16.7 a	95.2 bc	227.3	24	23.9
3	Sept 15	$2,050 bc	$54 c	8651 c	227 b	38.2 c	15.7 b	94.8 cd	295.2	33	22.1
5	Oct 15	$2,004 bcd	$44 d	**11735 a**	**258 a**	**45.5 a**	**17.2 a**	**96.2 a**	280.9	23	25.4
6	Nov 1	$1,918 cd	$41 d	**12214 a**	**259 a**	**47.1 a**	**17.4 a**	**95.7 ab**	286.6	9	26.4
1	Aug 15	$1,850 d	**$74 a**	4876 e	195 c	25.1 d	13.9 c	93.5 e	278.9	39	13.9
Average		$2,021.9	$53.6	9253.7	231.9	39.20	15.96	94.95	286.75	5	22.2
LSD 5%		147.0	4.9	597.1	15.4	2.05	0.88	0.58	119.04		
CV %		6.1	7.6	5.4	5.6	4.4	4.6	0.5	34.9		

***GDD** (Growing Degree Days): an average daily amount for the 2 weeks prior to that harvest date.
****Rain Inch:** Actual rainfall amount including 2 weeks prior to the planting date.
Comments: This trial was dry in June and early July, but caught some timely rains later in the season. Yield and sugar content increased through Mid October. Late rains also appeared to limit increases in sugar content.
Net $/A: Gross payment unless noted as net. Calculated assuming a $40 payment and a trial average RWST.
Bold: Results are not statistically different from top-ranking treatment in each column.

Gerstenberger, Sandusky, MI - 2018

Trial Quality: Fair
Variety: C-675
Planted: May 1
Harvested: See trts.
Plots: 6 rows X 38 ft, 4 reps
Row Spacing: 22 inches

Soil Info: Loam
% OM: 2.5 **pH:** 5.9 **CEC:** 12.1
P: above opt **K**: opt
Mn: high **B:** low
Added N: 155 lbs
Prev Crop: Soybeans

Rhizoc Level: Low
Cerc Control: Good
Problems: Small gaps in stand
Seeding Rate: 4.5 inches

No.	Harvest Date	Net $/A	$/Ton	RWSA	RWST	T/A	% SUC	% CJP	Beets/ 100ft	GDD*	Rain Inch**
7	Nov 8	**$1,464 a**	**$43 a**	**8553 a**	**251 a**	**34.0 a**	**16.8 a**	**95.8 ab**	213.8	N/A	14.8
6	Nov 1	$1,305 b	**$41 a**	7653 b	**243 a**	**31.5 a**	**16.6 a**	**96.1 a**	227.6	8	14.3
5	Oct 15	$1,181 bc	$38 b	6978 bc	225 b	31.1 ab	15.5 b	**96.1 a**	239.3	21	13.1
4	Oct 1	$1,052 c	$38 b	6144 c	224 b	27.4 b	15.6 b	95.1 bc	232.1	23	12.0
3	Sept 15	$851 d	$36 b	4916 d	210 c	23.4 c	14.7 c	94.4 cd	224.5	32	10.7
2	Sept 1	$720 d	$31 d	4150 d	176 d	23.4 c	12.8 d	95.2 de	240.6	34	9.8
1	Aug 15	$307 e	$33 c	1572 e	167 d	9.3 d	12.3 d	93.5 e	214.0	37	6.3
Average		$982.8	$37.3	5709.3	213.8	25.74	14.89	95.05	227.40	26	11.6
LSD 5%		146.0	1.8	856.8	9.7	3.79	0.52	0.76	29.11		
CV %		11.4	3.78	11.5	3.5	11.3	2.7	0.6	9.8		

***GDD** (Growing Degree Days): an average daily amount for the 2 weeks prior to that harvest date.
****Rain Inch:** Actual rainfall amount including 2 weeks prior to the planting date.
Comments: Less than adequate rains throughout the growing season limited both yield and sugar content. Canopy development was slow in this trial and beets never closed the rows. Late harvest gave respectible yields, but low sugars.
Net $/A: Gross payment unless noted as net. Calculated assuming a $40 payment and a trial average RWST.
Bold: Results are not statistically different from top-ranking treatment in each column.

Population Trial

Sylvester Farms, Quanicassee - 2018

Trial Quality: Good
Variety: B-149N
Planted: April 29
Harv/Samp: Nov 4 / Oct 31
Plot Size: 4 reps
Row Spacing: 24 inch
Seeding Rate: See treatments

Soil Info: Loam
Fertilizer: Fall: P & K, PPI: 45 gal 28%; 2x2: 7 gal 10-34-0, 3 gal Thiosul, 8 gal 28%
Prev Crop: Corn
Weather: Dry until mid July, then good weather

Rhizoc Control: Good control: I.F. & 8 leaf
Cerc Control: Good control: See comments for materials
Other Pests: N/A

Treatment	Net $/A	RWSA	RWST	T/A	% Sugar	% CJP	Population 100 Ft. 40 Days
55,000	$1,708	**10167**	**258**	**39.4**	**17.3**	**95.6**	220
62,000	$1,680	**10130**	**262**	38.7	**17.5**	**96.0**	248
LSD 5%	—	ns	ns	0.6	ns	ns	10
CV %	—	4	4	0.7	2.4	0.4	3

Comments: The goal of this trial was to start establishing the ranges of seeding rates to use with variable rate seeding. The trial was performed on a half mile long field. The north half contained some areas of lighter soil mixed with more productive loam. The south half was a more uniform loam. Prior to the trial, the grower believed the south half would out yield the north half. The harvest results were nearly identical from both ends of the field and the results of both ends were therefore combined. The 55,000 seeding rate provided a higher tonnage than the growers normal 62,000 seeding rate. Due to an unstatistical improvement for better sugar at the 62,000 population, the RWSA was nearly the same between the two rates. The average emergence in this trial was around 87% which is very high for sugarbeets. Improvements in planter and seed technology is resulting in much better emergence and this is demonstrated in the emergence counts of multiple SBA trials over the last few years. The net payment is the gross payment with a $3 per 1000 seeds cost deducted from the 62,000 rate. Leafspot materials were as follows: 6/21 Inspire XT + EBDC, 7/5 Priaxor + EBDC, 7/15 Super Tin + EBDC, 7/25 Topguard + EBDC, 8/8 Super Tin + EBDC, 8/18 Proline + EBDC, 9/1 Super Tin + EBDC, 9/11 Badge SC, 9/21 EBDC. All with a sticker.

Net **$/A:** Net payment assuming a $3/1000 seed cost. Calculated assuming a $40 payment and a company average RWST of 238.
Bold: Results are not statistically different from top ranking treatment in each column.

Population on Sandy Soil

Wishowski Farms, Auburn - 2018

Trial Quality: Good
Variety: SX-1243 RR
Planted: May 1
Harv/Samp: Nov 2 / Oct 23
Plot Size: 4 reps
Row Spacing: 30 inch
Seeding Rate: See treatments

Soil Info: Sand
Fertilizer: See fertilizer program in the comments.
Prev Crop: Corn
Weather: Dry until mid July, then good weather

Rhizoc Control: Good control: Quadris 6 leaf
Cerc Control: Fair control: See below for materials
Other Pests: N/A

Treatment	Net $/A	RWSA	RWST	T/A	% Sugar	% CJP	Population 100 Ft. 35 Days
52,400	$830	**5016**	**234**	**21.4**	**15.9**	**96.5**	**211**
47,900	$819	**4874**	**234**	**20.8**	**15.9**	**96.2**	**200**
56,400	$747	**4603**	**228**	**20.2**	**15.5**	**96.5**	228
Average	$799	4831	232	20.8	15.8	96.4	213
LSD 5%	—	ns	ns	ns	ns	ns	19
CV %	—	6	2	4.6	1.2	0.3	5

Comments: This trial was done to evaluate seeding rates on a sandy soil to help establish the ranges of seeding rates for variable rate seeding. The grower had a field with a larger section of sandy soil with most of the trial area having a CEC that ranged from 4.5-8.5. This would likely be similar to some of the sandy ridges that are in many fields. In addition to the light soil texture, this field also experienced a drought in the first half of the season that significantly impacted yields. There was no significant differences measured, but the 52,400 trended to be the best for both yield and quality. The average emergence in this field was about 71%, which is probably close to normal when planting into corn stalks on this light of ground. The net payment is the gross payment with a $3/1000 seeds cost deducted from the rates higher than 47900. The fertilizer program was as follows: Fall: 150# potash & 200# pel lime. Pop-up: 2 gal of 4-13-17 + 1 pt of Mn+Zn, 2x2: 15 gal 28%, 4 gal 10-34-0, 2 gal K Flex, S.D.: 32 gal 28% + 1 qt of B & Am Thio. Leafspot materials: 1. Topguard EQ, 2. Super Tin, 3. Inspire XL, 4. Super Tin, 5. Bagde SC. All sprays included EBDC and Regard.

Net **$/A:** Net payment assuming a $3/1000 seed cost. Calculated assuming a $40 payment and a company average RWST of 238.

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

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